

Olga IZDEBSKA , Jörg KNIELING 

## CITIZEN INVOLVEMENT IN WASTE MANAGEMENT AND CIRCULAR ECONOMY IN CITIES: KEY ELEMENTS FOR PLANNING AND IMPLEMENTATION

**Abstract.** This paper identifies and explores key elements for planning and implementing citizen involvement in the area of waste management and circular economy in cities. The analysis has shown that institutions responsible for waste management regard strategic planning, inclusivity, transparency, continuity, and resources as particularly important for reaching the objectives of citizen involvement. However, not all of the four analysed cities have applied these elements to the same extent, due to e.g. a lack of a strategy for citizen involvement, or limited personal and financial resources.

**Key words:** circular economy, circular city, waste management, citizen involvement, collaborative governance.

### 1. INTRODUCTION

Citizens can be seen as major actors within the waste management of cities and related circular economy (Bernstad, 2014; Evison and Read, 2001; Sharp *et.al*, 2010). As promoted by the European Commission, circular economy aims at maintaining the value of products and materials for as long as possible (European Commission, 2020). Thereby, it is crucial to recycle materials from waste, in order ‘to close the loop’ (*ibid.*). The connection between citizens, waste management and circular economy lies in their roles as consumers and waste producers. Individual awareness while performing these two roles can lead to more responsible consumption and compliance with waste separation and collection schemes resulting in increased reuse and recycling.

Public and private institutions responsible for waste management at the city level involve citizens through activities ranging from information, communi-

---

\* Olga IZDEBSKA, HafenCity University Hamburg, Überseeallee 16, 20457 Hamburg, Germany; e-mail: [olga.izdebska@web.de](mailto:olga.izdebska@web.de), ORCID: <https://orcid.org/0000-0002-4240-8616>

\*\* Jörg KNIELING, HafenCity University Hamburg, Überseeallee 16, 20457 Hamburg, Germany; e-mail: [joerg.knieling@hcu-hamburg.de](mailto:joerg.knieling@hcu-hamburg.de), ORCID: <https://orcid.org/0000-0003-1555-5458>

cation and consultation to participation (Smith, 1993; Rowe and Frewer, 2005) with the aim to promote pro-environmental behaviour and compliance with waste management schemes. However, behaviour patterns take time and effort to adjust (Csobod *et al.*, 2009). There are various strategies to stimulate environmentally significant consumer behaviour, such as using information and education to change attitudes and beliefs, appealing to basic values, offering financial or other material incentives, or modifying institutional structures (Stern, 1999).

It is advantageous for institutions responsible for waste management to know how to plan and implement citizen involvement, in order to reach their objectives. Yet this knowledge is broadly dispersed among different thematic fields, like environmental communication, urban planning participation, education and behavioural change, etc.

## 2. COLLABORATIVE GOVERNANCE AND CITIZEN INVOLVEMENT

The paper draws on the research project FORCE (Cities Cooperating for Circular Economy), which is based on the concept of collaborative governance, where different public and non-public actors (including city authorities, private companies, waste management authorities, associations, and citizens) jointly develop and implement eco-innovative solutions for promoting circular economy in their cities.

Ansell and Gash defined collaborative governance as a “governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative, and which aims to make or implement public policy or manage public programs or assets” (Ansell and Gash, 2008, p. 544). This definition implies the identification of synergies and the development of consensus among public and non-public stakeholders of a process to amplify its effectiveness. Emerson, Nabatchi and Balogh have expanded this definition as they described collaborative governance “as the processes and structures of public policy decision-making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private and civic spheres, in order to carry out a public purpose that could not otherwise be accomplished” (Emerson *et al.*, 2012, p. 2). The authors went beyond state-initiated actions and broadened the range of possible partnerships. Although these definitions differ slightly, they share the understanding that non-public stakeholders are not limited to private groups and institutions, but also include the civil society, whether in organised groups or as individuals.

Although the perspectives above include the civil society in the collaborative governance concept, they specify neither the method nor motivation for citizen

contribution. Regarding motivation, citizen participation was described by Cornwall as an essential ingredient to ensure efficient development of interventions and policies (Cornwall, 2006). As those are meant to regulate and serve civil society, the inclusion of peoples' perceptions in its design and implementation can be seen as an asset to produce efficient regulations. Still, according to Glass, the failure of many participatory programmes derives from the lack of structures and clearly defined objectives and inadequate mechanisms for participation to attend to such objectives (Glass, 1979). According to the collaborative governance regime framework of Emerson and Nabatchi, the structures and resources necessary to support engagement, including facilitation, leadership, and information, are an important element of collaborative governance (Emerson and Nabatchi, 2015). They also indicated 'shared motivation' (affective stance of individual participants to one another and to the process) as another relevant component.

Thus, collaborative governance explains the significance of involving citizens for achieving (in an effective manner) the objectives of waste management and circular economy in cities. The concept also suggests that authorities in charge of waste management have a higher chance of reaching their objectives if they share their motivations, if they have clearly defined objectives, well developed structures for citizen involvement, and resources available in order to reach the citizens and promote pro-environmental behaviour in the area of waste management and circular economy.

To examine these assumptions, this paper addresses the research question: what are the key elements for planning and implementing citizen involvement in the area of waste management and circular economy in cities? To support the investigation, the analysis is structured in three parts: (1) identifying and defining key elements for planning and implementing citizen involvement in the area of waste management and circular economy; (2) assessing how far those elements are regarded as important for reaching the objectives of citizen involvement by institutions responsible for waste management; and (3) determining if and how these key elements for citizen involvement are being applied in practice by the institutions responsible for waste management in the case of Copenhagen, Genoa, Hamburg, and Lisbon.

### **3. METHODOLOGY**

The analysis within the FORCE research focused on four cities, i.e. Copenhagen, Genoa, Hamburg, and Lisbon, and aimed at evaluating the tools and instruments for citizen involvement applied in the project, as well as recommending good practices for civic involvement in municipal waste management and circular economy in European cities.

The analytical framework was derived from findings of studies in the area of citizen involvement, communication, evaluation, and waste management, which indicated key elements for planning and implementing citizen involvement. They were then adopted as criteria for evaluating each of the instruments and tools for citizen involvement applied in the four case cities. For each criterion, concise questions were formulated that had to be answered by experts that had an overview of the citizen involvement tools implemented in their cities. For answering a Likert Scale (Joshi *et al.*, 2015), a widely used approach for scaling responses from 1 (strongly disagree) to 5 (strongly agree), was applied that allowed us to measure the degrees of opinions and obtaining qualitative data for the analysis. The evaluation focused on the process rather than the outcomes of citizen involvement, as they could not be measured during the project's duration, and the mix of different measures made it difficult to evaluate the impacts of each individual tool and instrument.

Collaborative governance states that citizens should be engaged and not merely 'consulted', yet the scope of this study was extended to include more types of citizen involvement instruments and tools, so all activities of the four cities were included in the evaluation to explore to what extent waste management authorities actively engaged citizens in their activities. Thereby, for each citizen involvement instrument and tool its main aim was specified with regard to the categories: inform, consult, involve, collaborate, or empower. This spectrum of public participation was taken over from the International Association for Public Participation (similar to the "Ladder of Citizen Participation" outlined by Arnstein (1969), according to which the participation goals and their impact on decision-making could be allocated within these five categories (with the first having the lowest and the last step having the highest impact on decision-making). Although the spectrum focused on decision-making, as most of literature presented to this point, Butteriss has indicated that the meaning of 'citizen participation' may vary and its scope of action may also refer to other aims, such as capacity building and relationship development (Butteriss, 2016).

The evaluation was based on a subjective assessment. By answering the questions, the cities could evaluate how their citizen involvement tools performed in each of the five evaluation criteria and establish in what areas their activities could be improved in the future. At the same time, through the application of the evaluation framework, the cities tested the importance of the five criteria for planning and implementing citizen involvement in waste management and circular economy in cities. Moreover, we obtained an overview of all implemented citizen involvement tools and instruments and their main aims (inform, consult, involve, collaborate, empower).

Additionally, we conducted ten qualitative semi-structured interviews with key organisations in charge of waste management in the four case cities and with communication experts from their organisations, in order to collect further information on the importance of the selected evaluation criteria and critically assess

those. We also determined if and how these key elements for citizen involvement were being applied in practice by the institutions responsible for waste management and circular economy. The semi-structured interviews gave the interviewees an opportunity to fully express their views and highlight the aspects of citizen involvement they ranked as most relevant.

#### **4. EMPIRICAL BASIS: COPENHAGEN, GENOA, HAMBURG, AND LISBON CASE-STUDIES**

The division of competences regarding waste management among public and private actors differs among the four cities. In some cases the municipality has a stronger role in organising and implementing waste management, in others, public (or public-private) companies assume responsibility.

Waste management competences in the City of Copenhagen are characterised by the presence of public and private actors who share different responsibilities. Being the main actor in implementing the national waste management plans and targets, the municipality is in charge of treating all waste, and enterprises are responsible for recycling their recyclable waste (Copenhagen Cleantech Cluster, 2012).

The City of Genoa is responsible for organising the collection, transport, and management of undifferentiated waste and its disposal in landfills. At the operational level, the municipal company AMIU Genova SpA covers all services related to the management of the waste cycle: from separation, waste collection and waste treatment, up to management of disposal plants and pre-treatment plants for recyclable fractions, as well as other related activities (e.g. street cleaning) (Azienda Multiservizi e D'Igiene Urbana, 2018).

In the City of Hamburg, the responsibility for waste management is shared between the Ministry of Environment and Energy, responsible for all ministerial and administrative duties concerning waste management, and the local city-owned public waste management company Stadtreinigung Hamburg, which is responsible for the disposal of waste from households (Ministry of Environment and Energy, 2017). The framework is complemented by various schemes of extended producer responsibility.

In the City of Lisbon, the municipal waste management plan is developed by the municipality in close collaboration with a public-private company Valorsul S.A., which is responsible for turning the national legislation into an action plan for the region of Lisbon. Regarding the operational tasks, municipalities are in charge of collecting waste from households and small waste producers, while producers that exceed this amount are responsible for managing their own waste (European Environmental Agency, 2016).

## 5. RESULTS

A cross-analysis of the results from the four cities has shown that citizen involvement played a more or less important role, depending on the cities' objectives that they wanted to reach within the FORCE project. For example, one of the main objectives of the City of Genoa was to implement an urban laboratory for integrated wood management, which does not necessarily require citizen involvement. On the other extreme there was the City of Copenhagen which aimed to establish three different collection schemes for household flexible plastic for which successful citizen involvement was crucial. Furthermore, although the cities implemented several different citizen involvement tools and instruments, most of them focused on informing citizens, and only to a small extent, through consultation or active involvement in joint development of project solutions.

Regarding the content of citizen involvement, it could be observed that the tools and instruments predominantly focused on improving sorting and the collection of waste, but not necessarily preventing its generation. This might be related to the obligations set in national legislations. In Denmark, for example, a city cannot finance activities related to waste prevention via the waste charge paid by households; waste prevention is mainly a national government matter.

Moreover, five key elements for successful planning and implementation of citizen involvement in the area of waste management and circular economy have been identified, which constitute the focus of this article. These include strategic planning, inclusivity, transparency, continuity, and resources. This section will be structured according to the objectives of the article. First, by introducing and defining each element, also on basis of theoretical considerations, then by assessing importance to those according to the interviewee opinions, and finally by identifying whether and how these elements have been present in the planning and implementing of citizen involvement in the four case cities.

### 5.1. Strategic planning

Strategic planning is understood as having a clear outline of a citizen involvement process (including an assessment of its scope, procedures and expected outputs) ready prior to its implementation (Rowe and Frewer, 2000; The Waste and Resources Action Programme [WRAP], 2010; Chakraborty and Stratton, 1993). The fact of having developed a strategic plan establishes trust among stakeholders, and increases the effectiveness and credibility of the process (Rowe and Frewer, 2000). It also minimises the chance of misunderstanding and conflict (*ibid.*).

The interviewees have agreed that having a strategy ready prior to implementation is vital for reaching the project's objectives. It helps to define the scope, the overall aim of the participatory process, and the objectives for each stage (e.g.

planning, implementation, etc.). The involvement of professional communication experts right from the beginning can improve the strategies and outputs. Stakeholder mapping (from strategic to operational level) is regarded as relevant. When developing a strategy for citizen involvement, a timeline and budget should be prepared, and feasible tools and instruments for implementation should be selected. It was recommended to decide how to monitor and evaluate the impact of the citizen involvement and how to make feedback loops possible to optimise a strategy during the implementation process. A strategy should also consider potential implementation risks and solutions.

The analysis has shown that three of the four cities had a strategy for citizen involvement prior to implementation, but the level of detail varied strongly between them. Also, differentiation could be made between a strategy at an institution/company level and a specific implementation plan on a project level. The role of stakeholder mapping was highlighted in the context of waste management strategy development, as it lists all subjects, names, and groups with whom a relationship needs to be built. It can also provide information which stakeholder groups need to be targeted, which are already involved, how they can be involved in the most constructive ways, etc. Even though all four cities have agreed that stakeholder mapping is fundamental, only three out of four cities had conducted it prior to implementation of citizen involvement activities. The fourth city targeted its citizens as a whole, without differentiating between the various citizen groups.

Several best practices were mentioned in this context. For example, the City of Genoa has provided a small budget for projects conducted by citizen associations and defined criteria for a competition in line with the city's strategic goals (e.g. increasing awareness in the area of waste collection). Another example included collaboration with local associations, community managers or local parish councils as intermediaries for conveying a message from the institutions responsible for waste management to the citizens. The intermediaries know how to reach the citizens in the fastest and most efficient way and they have the advantage that citizens usually know and trust them, which is not always the case with public authorities.

## **5.2. Inclusivity**

Inclusivity is defined as ensuring a variety of perspectives through the involvement of various affected citizen groups (Rowe and Frewer, 2000; Webler, 1995; Mee and Clewes, 2004; Petts, 2001). For achieving true inclusivity, all affected communities should be involved (Rowe and Frewer, 2000). The greater the range of different interests and concerns in a decision-making process, the greater the chances of achieving acceptance of environmental and social decisions (Petts, 2001). Moreover, citizen involvement offers new perspectives to solutions pro-

posed by waste management authorities, making them more suitable for addressing citizens' needs. It is crucial to choose the right means of communication for ensuring that information will reach a large group of citizens (Webler, 1995). Moreover, in order to help choosing the language and channels for an awareness campaign, identifying the target group beforehand can be advantageous, since strategies can change depending on geographic and demographic variables (*ibid.*).

The interviewees have confirmed that inclusivity of various citizen groups is vital for reaching the objectives of citizen involvement. Therefore, the use of a variety of involvement tools and communication channels enables one to address a wide range of inhabitants. Ethnic minorities can be reached by providing information in several foreign languages and by local facilitators. The community of disabled people has very particular needs and should be involved through their representative associations.

The analysis showed that all four cities considered various population groups in their citizen involvement activities including children/pupils, adults, the elderly, and other relevant stakeholders like companies and associations. A variety of different channels for reaching different groups was used, *inter alia* printed booklets, newsletters and a call centre for the elderly, social media and apps for teenagers/young adults, or environmental education and recycling plant visits for children. Still, all the cities focused mostly on informing citizens and to a small extent on consultation or active involvement in developing project solutions. Regarding the content of citizen involvement, it could be observed that the tools and instruments predominantly focused on improving sorting and collecting waste, but not necessarily on prevention. This, however, might have been a result of the obligations set in national legislations. In Denmark, for example, waste prevention is a national government matter and, therefore, municipalities cannot finance such activities via a waste charge paid by households.

Several best practices were mentioned. In the City of Genoa, when the collection system in a neighbourhood was changed, the waste management company organised information activities in schools. Pupils then transferred the information to their families. Printed material (potential waste) was replaced by direct contact (information meetings). To encourage participation of the elderly in public meetings, the attendees were given free tickets to a garden exhibition, what resulted in high participation rates.

### **5.3. Transparency**

Transparency is understood as clearly disclosing information, rules, plans, processes, and actions (Transparency International, 2019). It also implies the provision of relevant, complete and clear information in citizen involvement (Rowe and Frewer, 2000). The fact of having a transparent and comprehensive communica-



tion approach can increase trust between users and providers of the waste management system (UN Habitat, 2010). The users of a waste management service (citizens) are more likely to cooperate if they understand why services are set up in a particular way and why it is important to separate the materials as requested by a service provider or municipality (ibid.). Furthermore, transparency is crucial to ensure trust among stakeholders, as well as credibility and legitimacy of the process (Transparency International, 2019; Rowe and Frewer, 2000).

The interviewees have confirmed that having transparent communication is vital for reaching the citizen involvement's objectives. They stressed that communication needs to be clear and easy to understand (simple vocabulary, inclusion of pictures/illustrations, use of vibrant colours, etc.). It was highlighted that positive messages can motivate and inspire the citizens better than negative communication. Citizen involvement activities should be stimulating and engaging. It is important to explain to citizens how waste needs to be separated, why this should be done, and what happens with it afterwards, so citizens can see that their efforts are meaningful. The fact of providing practical tips can help citizens learn how to improve their behaviour. Therefore, the gains for the individual, but also for the collective, should be highlighted. Convenience also plays a vital role – good waste infrastructure accessibility has a positive impact on participation rates. Finally, the interviewees mentioned that incentives, for example discounts on waste tax or on everyday shopping, further support the promotion of behavioural change.

The analysis has shown that elements for increasing the transparency of the process and information have been applied in all four cities. Information posters prepared by the cities were clear, easy to understand and visual, e.g. showing exemplary objects for the different types of waste. In some of the cases a description explaining how waste had to be separated, why this should be done, and what happened with it afterwards was provided.

Several best practices were mentioned. The City of Copenhagen placed containers for plastic bags and glass bottles with no refund in three retail shops right next to a PET bottle collection machine, so the citizens bringing PET bottles to the store could easily and correctly dispose of the plastic bag, as well as the no-refund bottles. An example for convenience associated with transparency is the CYCEL online platform (“reCYCLE your Electronics”, [www.cycl.de](http://www.cycl.de)) in Hamburg, which provides information needed to deal with broken electronic devices (repair guidelines, the addresses of repair cafes, donation possibilities, disposal guidelines, etc.).

#### 5.4. Continuity

Continuity refers to the timeframe for the implementation of strategies and tools, implying the length and frequency of their application (Bickerstaff and Walker, 2001; Petts, 2001; Maibach, 1993; Sharp *et al.*, 2010). Awareness campaigns with

durations limited to weeks or some months are not sufficient to promote a long-term behaviour change, a longer and lasting commitment is necessary (Rogers and Storey, 1987). Thus, continuity is essential for strategic planning of effective citizen involvement. Furthermore, diluting the information (with applicable practical suggestions) throughout a longer timeframe instead of delivering it all at once has a better result in terms of behaviour change (Sharp, Giorgi and Wilson, 2010). In the context of participatory involvement activities (e.g. workshops and public meetings), the timeframe is also crucial (Petts, 2001). It is relevant to waste management in various ways: from the total length of a programme, to the interval between communications and the time provided for such communication to take place (*ibid.*).

The interviewees stated that providing information over a longer period of time and on a regular basis could foster behaviour changes. Moreover, continuity of activities prevents people from losing interest in the topic and wasting the efforts and investments already made for involvement activities. A regular exchange enables trust building and strengthening of the relationship between a city or waste management company and other stakeholders and citizens. Furthermore, connecting the topic of waste with currently popular issues can make it more visible. Finally, the interviewees indicated that regular monitoring of the impacts, results and learnings is essential in order to make adjustments during a process.

The analysis has shown that citizen involvement activities in some cities happened on a more regular basis whereas it was more clustered in others. This could have been impacted by the degree of detail of the strategic plan for citizen involvement in the cities. One city that had no strategic plan for their citizen involvement activities clustered their actions (publicity campaign) and implemented them over a relatively short period.

Several good practices were mentioned. In order to achieve a behavioural change, Genoa's waste management company has a communication plan consisting of several phases of more intense communication shortly before Christmas and Easter, when people tend to consume more. The City of Hamburg has a couple of days in the year when citizens can contribute to cleaning their city. In 2017, the number of participants increased by 10,000 people (in comparison to 2016) with the result that waste collected by the waste company decreased.

## **5.5. Resources**

Resources refer to the compatibility of time, staff and financial resources dedicated to a project and the reaching of its predefined goals (Rowe and Frewer, 2000). The goal to implement changes in a waste system generally implies changing peoples' habits (UN Habitat, 2010). The acceptance of new habits depends largely on the persons who are presenting the knowledge, how it is presented, the credibility of the communicator, and the conditions on which the knowledge is transferred

(Desa *et al.* 2011). Therefore, human resources (experts, local authorities, community representatives) are crucial to ensure the quality of the outcome of a public participation exercise (Rowe and Frewer, 2000). Mediation may also be needed in citizen involvement processes, not only to encourage stakeholder participation but also to settle antagonisms and seek productive discussions (Forrester, 2008). Furthermore, resources are necessary for implementing financial incentives like discounts on the waste tax or on everyday shopping that can promote environmental behaviour. The cost-effectiveness should also be considered when deciding about the resources dedicated for conducting for a certain participation exercise; the time and money dedicated to it should be coherent to the magnitude of the outcome expected (Rowe and Frewer, 2000).

The interviewees agreed that the involvement of skilled people (topic experts, local authorities, community representatives) in the planning and implementation of citizen involvement activities can ensure a higher quality of the process outcomes. People need to know the topic area so that stakeholders can ensure the credibility of communication and the provided information. In addition, expertise in participative processes (e.g. facilitation), suitable tools and formats (e.g. focus groups), and the skill of active listening are important. According to the interviewees, social media are one of the most cost-effective citizen involvement tools, even though not all age groups can be thus reached. Participatory processes are generally more expensive initially, but in the long run they become cheaper and more effective. Finally, they mentioned that education of waste management company employees who work on site (those who empty bins) should be kept in mind as they are often in contact with citizens and should be able to provide accurate responses to their questions.

The analysis showed that the expertise of the city administration or the people from a waste management company (personal resources) involved in the process, as well as the financial resources dedicated to citizen involvement impacted both the details of strategic planning and further activities. In some cases the experts managing the activities had knowledge in the area of communication and participation, as well as waste management, in others the experts had to reach out to the communication departments of their organisations during the preparation or implementation of citizen involvement activities. Experts combining knowledge in both fields had an advantage as they could plan the activities on their own, which was more time and resource-efficient. However, working in cross-sectoral teams can achieve comparable results if there are well thought through routines in place.

In this context, a household waste analysis was indicated as good practice. Once a year, Hamburg's waste management company conducts such an analysis based on samples in order to measure the amounts of waste being collected and the changes in separation behaviour. It was recommended to base evaluation criteria on a household waste analysis, which allows for assessing the cost-effectiveness of the applied citizen involvement tools.

## 6. CONCLUSION

The research presented in this paper provides further evidence on the key factors for successfully planning and implementing citizen involvement in waste management and circular economy in cities. Based on the concept of collaborative governance, which highlights the role of dialogue and collaboration between citizens and actors in charge of waste management for achieving the objectives in a more effective way, the empirical research provided valuable insights regarding the key elements to be considered.

As a result of the analysis, five factors were identified as relevant: strategic planning, inclusivity, transparency, continuity, and resources. All those factors were regarded by interviewed institutions responsible for waste management as being of key importance for conceptualising and implementing citizen involvement in the area of waste management and circular economy. However, as the analysis also showed, not all four case cities have applied these five factors to the same extent. The reasons for that include, e.g. a lack of a strategic plan for citizen involvement activities, as well as limited personal and financial resources. Nevertheless, the analysis allowed for a detailed description of each of the key elements for citizen involvement, including important aspects that should be considered, and it provided a number of good practices implemented.

Based on the analysis of the four cities, it could be observed that in the majority of cases citizen involvement in the context of waste management and circular economy focuses on informing citizens about how to behave and what to do with waste, rather than on a joint and collaborative development of solutions. This raises the question of how and to what extent institutions responsible for waste management could incorporate more citizen involvement formats that go beyond information and unidirectional communication.

There have been some limitations to the study discussed in this paper, and those should be pursued further. On the one hand, the evaluation of the citizen involvement tools and instruments focused more on the process than on the outcomes, and, on the other, it was based mainly on the perception of the interviewed experts, not on a quantitative analysis of waste data. Moreover, it would be beneficial to have a larger sample size. Additionally, further research would benefit from assessing the citizen involvement tools and instruments regarding their effectiveness to reach the goals set in strategic planning by the waste management authorities. More research is also needed in the area of behavioural change. In particular, it would be significant to investigate what aspects have the highest impact on making citizens that already are environmentally aware change their behaviour. Against the background of the findings in the case cities, we can only assume that information, incentives, and convenience play relevant roles.

**Acknowledgements.** FORCE (cities cooperating FOR Circular Economy) (Grant agreement n° 689157) is a research and innovation project running from 2016 till 2021 that was co-funded by the Horizon 2020 Framework Programme of the European Union. Responsibility for the information and views expressed therein lies entirely with the authors.

The authors would like to sincerely thank the City of Copenhagen, the City of Genoa, AMIU Genova spA, Stadtreinigung Hamburg AöR, the City of Lisbon, and AddaptCreative for sharing their valuable knowledge and experiences, as well as Camila Maria Camara for her support as a research assistant.

## REFERENCES

- AJZEN, I. (1991), 'The Theory of Planned Behavior', *Organizational Behavior and Human Decision Processes*, 50 (2), pp. 179–211.
- AMIU (AZIENDA MULTISERVIZI E D'IGIENE URBANA) (2018), Business Plan 2018–2020 [Piano Industriale 2018–2020].
- ANSELL, C. and GASH, A. (2008), 'Collaborative Governance in Theory and Practice', *Journal of Public Administration Research and Theory*, 18 (4), pp. 543–571.
- ARNSTEIN, S.R. (1969), 'A Ladder of Citizen Participation', *Journal of the American Institute of Planners*, 35 (4), pp. 216–224.
- BARR, S., GUILBERT, S., METCALFE, A., RILEY, M., ROBINSON, G.M. and TUDOR, T.L. (2013), 'Beyond recycling: An integrated approach for understanding municipal waste management', *Applied Geography*, 39, pp. 67–77.
- BEHÖRDE FÜR UMWELT UND ENERGIE (2018), *Abfallstatistik 2017: Siedlungsabfälle*, <https://www.hamburg.de/contentblob/11362522/efad41bd4c34a3c09d7ade2a8ba4ca2c/data/d-statistik-siedlungsabfall-2017.pdf> [accessed on: 01.04.2019]
- BERNSTAD, A. (2014), 'Household food waste separation behavior and the importance of convenience', *Waste Management*, 34 (7), pp. 1317–1323.
- BICKERSTAFF, K. and WALKER, G. (2001), 'Participatory Local Governance and Transport Planning', *Environment and Planning*, 33 (3), pp. 431–451.
- BORTOLETO, A.P., KURISU, K.H. and HANAKI, K. (2012), 'Model development for household waste prevention behaviour', *Waste Management*, 32 (12), pp. 2195–2207.
- BUNDESMINISTERIUM FÜR VERKEHR UND DIGITALE INFRASTRUKTUR (2014), *Handbuch für eine gute Bürgerbeteiligung. Planung von Großvorhaben im Verkehrssektor*, Berlin, [https://www.bmvi.de/SharedDocs/DE/Publikationen/G/handbuch-buergerbeteiligung.pdf?\\_\\_blob=publicationFile](https://www.bmvi.de/SharedDocs/DE/Publikationen/G/handbuch-buergerbeteiligung.pdf?__blob=publicationFile) [accessed on: 16.12.2019]
- BUTTERISS, C. (2016), 'What is community engagement, exactly?', *Bang the Table*, web log post 10 July, <https://www.bangthetable.com/blog/defining-community-engagement> [accessed on: 21.03.2019]
- CHAKRABORTY, S. and STRATTON, R. (1993), 'An integrated regional approach to risk management of industrial systems', *Nuclear Safety*, 34 (1), pp. 1–8.
- CORNWALL, A. (2006), 'Historical perspectives on participation in development', *Commonwealth and Comparative Politics*, 44 (1), pp. 62–83.
- COPENHAGEN CLEANTECH CLUSTER (2012) *Denmark: we know waste*, Copenhagen.

- CŠOBOD, Ę., GRĀTZ, M. and SZUPPINGER, P. (2009). *Overview and Analysis of Public Awareness Raising Strategies and Actions on Energy Savings*, Report no. INTENSE/Deliverable 6.1/WP6/Year 2009, [http://www.intense-energy.eu/uploads/tx\\_trieddownloads/INTENSE\\_WP6\\_D61\\_final.pdf](http://www.intense-energy.eu/uploads/tx_trieddownloads/INTENSE_WP6_D61_final.pdf) [accessed on: 16.12.2019]
- DESA, A., KADIR, N.B.Y.A. and YUSOFF, F. (2011), 'A Study on the Knowledge, Attitudes, Awareness Status and Behaviour Concerning Solid Waste Management', *Procedia Social and Behavioral Sciences*, 18, pp. 643–648.
- EMERSON, K., NABATCHI, T. and BALOGH, S. (2012), 'An Integrative Framework for Collaborative Governance', *Journal of Public Administration Research and Theory*, 22 (1), pp. 1–29.
- EMERSON, K. and NABATCHI, T. (2015), 'Collaborative governance regimes', Georgetown University Press, Washington, D.C.
- EUROPEAN COMMISSION (2020), Circular Economy, [https://ec.europa.eu/growth/industry/sustainability/circular-economy\\_en](https://ec.europa.eu/growth/industry/sustainability/circular-economy_en) [accessed on: 28.06.2020]
- EUROPEAN ENVIRONMENTAL AGENCY (2016), *Municipal Waste Management. Country Factsheet – Portugal*.
- EVISON, T. and READ, A.D. (2001). 'Local Authority recycling and waste – awareness publicity/promotion', *Resources Conservation and Recycling*, 32 (3–4), pp. 275–291.
- FORESTER, J. (2008), 'Making Participation Work When Interests Conflict: Moving from Facilitating Dialogue and Moderating Debate to Mediating Negotiations', *Journal of American Planning Association*, 72 (4), pp. 447–456.
- FREY, B.S. and OBERHOLZER-GEE, F. (1997), 'The Cost of Price Incentives: An Empirical Analysis of Motivation Crowding-Out', *The American Economic Review*, 87 (4), pp. 746–755.
- GLASS, J.J. (1979), 'Citizen Participation in Planning: The Relationship Between Objectives and Techniques', *Journal of the American Planning Association*, 45 (2), pp. 180–189.
- GRODZINSKA-JURCZAK, M., BARTOSIEWICZ, A., TWARDOWSKA, A. and BALLANTYNE, R. (2003), 'Evaluating the Impact of a School Waste Education Programme upon Students', Parents' and Teachers' Environmental Knowledge, Attitudes and Behaviour', *International Research in Geographical and Environmental Education*, 12 (2), pp. 106–122.
- HAGE, O., SANDBERG, K., SÖDERHOLM, P. and BERGLUND, C. (2008), 'Household Plastic Waste Collection in Swedish Municipalities: A Spatial-Econometric Approach', European Association of Environmental and Resource Economists Annual Conference: 25–28.06.2008, pp. 1–30.
- INTERNATIONAL ASSOCIATION FOR PUBLIC PARTICIPATION [IAP2] (2014), *IAP2's Public Participation Spectrum*, [https://www.iap2.org.au/Tenant/C0000004/00000001/files/IAP2\\_Public\\_Participation\\_Spectrum.pdf](https://www.iap2.org.au/Tenant/C0000004/00000001/files/IAP2_Public_Participation_Spectrum.pdf) [accessed on: 16.12.2019]
- JÄCKEL, K., FODOR, M. and PAPP, J. (2015), 'Environment conscious consumers' opinion on selective waste management', *Journal of Contemporary Economic and Business Issues*, 2 (2), pp. 5–22.
- JOSHI, A., KALE, S., CHANDEL, S. and PAL, D.K. (2015), 'Likert Scale: Explored and Explained', *British Journal of Applied Science and Technology*, 7 (4), pp. 396–403.
- MAIBACH, E. (1993), 'Social marketing for the environment: using information campaigns to promote environmental awareness and behavior change', *Health Promotion International*, 8 (3), pp. 209–224.
- MINISTRY OF ENVIRONMENT AND ENERGY [Behörde für Umwelt und Energie] (2017), *Municipal Waste Management Plan [Abfallwirtschaftsplan Siedlungsabfälle]*, Hamburg: Freie und Hansestadt Hamburg.
- MEE, N. and CLEWES, D. (2004), 'The influence of corporate communications on recycling behaviour', *Corporate Communications: An International Journal*, 9 (4), pp. 265–275.
- MERRIAM-WEBSTER (2019), 'Continuity', <https://www.merriam-webster.com/dictionary/continuity> [accessed on: 16.12.2019]

- MERRIAM-WEBSTER (2019), 'Network'. <https://www.merriam-webster.com/dictionary/network> [accessed on: 14.12.2019]
- PETTS, J. (2001), 'Evaluating the Effectiveness of Deliberative Processes: Waste Management Case-studies', *Journal of Environmental Planning and Management*, 44 (2), pp. 207–226.
- REAMS, M.A. and RAY, B.H. (1993), 'The effects of three prompting methods on recycling participation rates: a field study', *Journal Environmental Systems*, 22 (4), pp. 371–379.
- ROGERS, E. and STOREY, J. (1987), 'Communication Campaigns', [in:] BERGER, C. and CHAFFEE, S. (eds.), *Handbook of communication science*, California, Sage, pp. 817–846.
- ROWE, G. and FREWER, L.J. (2000), 'Public Participation Methods: A Framework for Evaluation', *Science, Technology, and Human Values*, 25 (1), pp. 3–29.
- ROWE, G. and FREWER, L.J. (2005). 'A Typology of Public Engagement Mechanisms', *Science, Technology and Human Values*, 30 (2), pp. 251–290.
- SCHWARTZ, S.H. (1977), 'Normative Influences on Altruism', *Advances in Experimental Social Psychology*, 10, pp. 221–279.
- SETTI, M., BLANCHELLI, F., FALASCONI, L., SEGRÈ, A. and VITUARI, M. (2018), 'Consumers' food cycle and household waste. When behaviors matter', *Journal of Cleaner Production*, 185, pp. 694–706.
- SHARP, V., GIORGI, S. and WILSON, D.C. (2010), 'Delivery and impact of household waste prevention campaigns (at the local level)', *Waste Management and Research*, 28 (3), pp. 256–268.
- SMITH, L. (1993), *Impact assessment and sustainable resource management*, Harlow: Longman.
- STERN, P.C. (1999), 'Information, Incentives, and Proenvironmental Consumer Behaviour', *Journal of Consumer Policy*, 22 (4), pp. 461–478.
- STERN, P.C. (2000), 'Toward a Coherent Theory of Environmentally Significant Behaviour', *Journal of Social Issues*, 56 (3), pp. 407–424.
- THØGERSEN, J. (2003), 'Monetary Incentives and Recycling: Behavioural and Psychological Reactions to a Performance-Dependent Garbage Fee', *Journal of Consumer Policy*, 26 (2), pp. 197–228.
- TRANSPARENCY INTERNATIONAL (2019), *Anti-Corruption Glossary: Transparency*, <https://www.transparency.org/glossary/term/transparency> [accessed on: 14.12.2019]
- UN HABITAT (2010), *Solid Waste Management in the World's Cities. Water and Sanitation in the World's Cities 2010*, Earthscan, London, UK.
- WANG, Z., GUO, D., WANG, X., ZHANG, B. and WANG, B. (2018), 'How does information publicity influence residents' behaviour intentions around e-waste recycling?', *Resources, Conservation and Recycling*, 133, pp. 1–9.
- WEBLER, T. (1995), "'Right" discourse in citizen participation: An evaluative yardstick', [in:] RENN, O., WEBLER, T. and WIEDEMANN, P. (eds.), *Fairness and competence in citizen participation: Evaluating models for environmental discourse*, Dordrecht: Springer, pp. 35–86.
- WRAP (THE WASTE AND RESOURCES ACTION PROGRAMME) (2010), *Improving the performance of waste diversion schemes – A good practice guide to monitoring and evaluation*, Banbury: WRAP Project.