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Interdisciplinary Environmental Review

ISSN online: 2042-6992 - ISSN print: 1521-0227
https://www.inderscience.com/ier

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DOI: 10.1504/IER.2023.10059958

Article History:

Received:	28 July 2023
Last revised:	14 September 2023
Accepted:	23 September 2023
Published online:	28 June 2024

Analysing supporting mechanisms, cultural shaping and incentives for circular economy: the case of local governments

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Abstract: This research examines the effectiveness of local government policies regarding the circular economy in two directions: in shaping an ecological culture for households and enterprises and in creating a favourable environment for incentives. It also identifies inefficiencies, failures and good practices. A qualitative research was carried out via semi-structured interviews of twelve local self-administrative officials responsible for policy making on circularity. Findings indicate the impact of local-self administrative authority policies on citizens, households and enterprises, identifying strengths and weaknesses. It also suggests interventions towards the formation and consolidation of a strong ecological culture on circular economy issues, with emphasis on information networks and proposes interventions that are related to strengthening incentives for households and enterprises to participate in circularity. The results of the research can be used by European, national and local bodies who have the responsibility of developing policies for the circular economy.

Keywords: circular economy; shaping culture; local-self administration; local policies; Greece.

Reference to this paper should be made as follows: Makris, I., Apostolopoulos, S. and Dimitrakopoulos, P. (2024) 'Analysing supporting mechanisms, cultural shaping and incentives for circular economy: the case of local governments', *Interdisciplinary Environmental Review*, Vol. 23, No. 3, pp.218–235.

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This paper is a revised and expanded version of a paper entitled 'Local policies supporting circular economy in shaping culture and incentives for households and enterprises' presented at the 40th B&ESI Conference, Florence, 6–9 July 2023.

1 Introduction

Sustainable development is pursued through policies that support circular economy. The success of such policies contributes to ensuring that the consumption of natural resources is less than what nature can regenerate. At the same time, these policies help to address the consequences of climate change. Policies implemented towards circular economy issues usually follow three directions: European, national and local institutions. The main actor representing the local institutions that formulate policies related to circularity in Greece is the local self-administrative authority. The linear economic system is responsible for the overconsumption of resources that exceeds the planet's ability to

replenish them, which is why new sustainable systems are constantly being sought through the circular economy (Palmié et al., 2021; Hofmann, 2019; Oghazi and Mostaghel, 2018). From the Paris Agreement in 2015 to the United Nations Climate Change Conference in Glasgow in 2021, over half a trillion tonnes of new resources have been consumed and over 70% more resources have been extracted than the planet can replenish (CGR, 2022). Furthermore, the circular economy is able to intervene decisively in the systems of production and consumption (Kirchherr et al., 2017a) and introduce major changes to the daily lives of citizens and the operation of businesses, as well (Hobson and Lynch, 2016). In this regard, the new sustainable recycling and re-use systems require timely information and awareness-raising among citizens and businesses in order to be effective (Korsunova et al., 2021; Blasi et al., 2021; Fonseca and Domingues, 2018). A new culture on circular economy issues is needed (Grafström and Aasma, 2021; Salvioni and Almici, 2020). It is required to raise awareness among citizens and enterprises about the impact of overconsumption of resources and the need to move to sustainable systems (Apostolopoulos et al., 2023, Kirchherr et al., 2017b; Rizos et al., 2016). Therefore, in order to be effective, the implementation of the circular economy requires the cooperation of policy makers, citizens, entrepreneurs and the whole supply chain (Dervojeda et al., 2014; WBCSD, 2011; Parker et al., 2009). Especially the institution of local government, which is close to citizens and households and in parallel has the responsibility of waste management, constitutes an important component of the recycling and materials reuse sector (Palm and Bocken, 2021; Dagilienė et al., 2021; Bolger and Doyon, 2019). Moreover, the local government has the ability to encourage residents to participate in the implementation of circularity planning and at the same time to transform the objectives of the circular economy into actions (Bolger and Doyon, 2019). Additionally, public policies pursued by local government remain vital for circular systems (Dagilienė et al., 2021). In this respect, local government is also motivated by the central government's decisions that design the systems of sustainable development strategies (Psillaki et al., 2023; Apostolopoulos et al., 2020; Broman and Robèrt, 2017; Gorica et al., 2012; Kardos, 2012). They jointly formulate incentives for citizens, households and companies to participate in circular systems (Burchard-Dziubińska and Dziubiński, 2019; Dapp, 2018; Fischer and Pascucci, 2017).

On top of that, the Green Deal is eventually expected to tackle the free-riding practices which according to the Nobel Prize-winning economist Nordhaus (2019) were a major issue in the past regarding the effectiveness of global policies on climate change. In this regard, he indicated that the national policies pursued by several countries across the world, including local communities' actions, (as they follow their own paths) seem to be implemented more easily but they do not ultimately address the global problems.

This primary research examines the local policies on circular economy issues in three aspects that have not been investigated in depth so far: The establishment of a system that will inform and aware citizens, the creation of a culture of circularity among citizens, households and enterprises, and the incentives to participate in and support circularity. The present study focuses on the impact of local government initiatives on the aforementioned aspects.. The rest of the paper is organised as follows. A brief literature review will be presented in the next section (Section 2), the methodology will be discussed in Section 3, findings will be presented in Section 4 and a discussion with concluding remarks will follow in Sections 5 and 6.

2 Literature review

The circular economy in relation to local government has attracted research interest (Palm and Bocken, 2021; Bolger and Doyon, 2019; Dagilienė et al., 2021) and has gained momentum in the field of research and implementation (Mhatre et al., 2021). The research lens has focused on the promotion of the circular economy through solid waste management and circular initiatives by local governments (Russell et al., 2020; Fratini et al., 2019; Lindqvist, 2013). It has also focused on supply chains and closed material cycles (Homrich et al., 2018). However, various studies claim that the implementation of the circular economy by local authorities has been explored in a fragmented way (Dagilienė et al., 2021; Cainelli et al., 2020). International literature is dominated by articles on the circular economy in relation to local government in large cities, while research on small towns and the countryside is limited (Cramer, 2022; Prendeville et al., 2018; Wang et al., 2018). Low emphasis has been placed on the examination of the role of local government in shaping a culture of circular economy issues among citizens, households and enterprises (Dagilienė et al., 2021). While there is a strong interest in people's lifestyles and their perception of how to achieve sustainable development (García-González et al., 2020; Geng et al., 2009; Liu et al., 2009) there is no relevant research interest in people's awareness of the circular economy (Guo et al., 2017). Research by Ilić and Nikolić (2016) showed low levels of reuse and recycling of materials and a lack of incentives for citizen participation in municipal circular economy systems. While according to other surveys local self-administration plays a significant role in supporting changes for effective waste management (Zotos et al., 2009) there is a deficit in raising public awareness of the need to participate in waste management within the logic of circularity (Ilić and Nikolić, 2016; Hottle et al., 2015). On the other hand, Bolger and Doyon's (2019) research that examined local government strategies for facilitating the circular economy revealed that urban planning has the potential to translate the goals of the circular economy into actions. Moreover, countries vary widely in the development of the circular economy (Cramer, 2022). The powerful role of the central government usually corresponds to a greater involvement of local government in the circular economy (Cramer, 2022). Because the circular economy is a key element in achieving sustainability, both governments and local authorities have developed action plans to strengthen the circular economy (Alonso et al., 2022; Gravagnuolo et al., 2019). In collaboration with the educational system, they try to sensitise children from an early age and students as well on circular economy issues (Owojori et al., 2022; Kirchherr and Piscicelli, 2019; Wandl et al., 2019). Research by Palm and Bocken (2021) indicated that local governments should reflect on their power and role in ensuring strategies and objectives of the circular economy. They have to build trusting relationships with circular economy stakeholders and gain consensus as well as partnerships and resource flows (Nogueira et al., 2020; Palm et al., 2019).

3 Methodology

3.1 Selection of research method and definition of sample and strategies

Based on the international literature, we followed the phenomenological approach because it effectively captures human views and experiences, opportunities and challenges (Al-Dajani et al., 2019; Pringle et al., 2011; Norlyk and Harder, 2010). Regarding the validity and reliability of our research, we took into account the research paradigm since the subject does not exist in an external world but is created by the interactions of the subject with the world (Guba and Lincoln, 1994). Therefore, we chose the qualitative research method with participant interviews using the example of interpretivism, which is an example of a qualitative nature (van der Walt, 2020; Levi-Sanchez and Toupin, 2014; Williams and Morrow, 2009). Additionally, qualitative research aims to better understand the views and experiences of people who experience the phenomenon (Apostolopoulos et al., 2021; Ungar, 2004; Fossey et al., 2002) which is a crucial issue in order to trace the experiences and views of people designing policies for the circular economy. Moreover, qualitative surveys that detect human attitudes, opinions, expectations and feelings are considered very effective (Kyngäs, 2020; Borbasi and Jackson, 2012). For the collection of the relevant sample we used individual semi-structured interviews as these are considered appropriate to capture opinions, perceptions, experiences, expectations and feelings, as well (DeJonckheere and Vaughn, 2019; Patton, 1990). The above practice is largely used in qualitative research and contributes to the reliability, objectivity and effectiveness of the sample (Blattner et al., 2020; DeJonckheere and Vaughn, 2019; Wallace et al., 2019). This method is also used in research on circular economy (see for example, Sarma et al., 2023). The semi-structured interviews were structured based on the following themes: First thematic section concerns networks of information, communication and control, second thematic section concerns certain policies on cultural shaping and the last one concern incentives for households and enterprises to become familiar with the circular economy.

3.2 Elements of the survey

Based on the principle of appropriateness and adequacy, we defined our sample to avoid the loss of any subjective or individualised characteristics (Polit and Hungler, 1999; Morse and Field, 1996, Morse, 1994). Purposive sampling technique was employed to trace and approach the above-mentioned persons (Apostolopoulos et al., 2022; Schmidt et al., 2020; Apostolopoulos and Liargovas, 2016; Kenny and Duckett, 2003) who were involved in this particular procedure. According to Patton (2002) this sampling technique, which is used very often in qualitative studies, refers in the selection of information-rich cases for study in depth and at the same features small sample orientations since there exist homogeneity. The participants were recruited based on specific criteria relevant to their common characteristics (Hussain et al., 2018; Amoatey et al., 2015; Bagheri et al., 2013) such as the role and the duties towards energy transition projects of the examining areas. Therefore, the selected participants appeared to be the appropriate choice cause of their deep knowledge regarding the topic (Cresswell and Clark, 2011; Bernard, 2002). In light of the above, we selected twelve local government executives from Greece who have responsibilities and make decisions on solid waste and circular economy issues, such as the management of recycling progress.

Table 1 The selected survey participants and their identity

R	*Status*
R1	Mayor – total population of municipality: 71,897 people (2021 census)
R2	Mayor – total population of municipality: 19,200 people (2021 census)
R3	Mayor – total population of municipality: 5,772 people (2021 census)
R4	Mayor – total population of municipality: 17,179 people (2021 census)
R5	Mayor – total population of municipality: 22,367 people (2021 census)
R6	Mayor – total population of municipality: 8,508 people (2021 census)
R7	Deputy Mayor responsible for solid waste and recycling issues
R8	Deputy Mayor responsible for solid waste and recycling issues
R9	Deputy Mayor responsible for solid waste and recycling issues
R10	Deputy Mayor responsible for solid waste and recycling issues
R11	Deputy Mayor responsible for solid waste and recycling issues
R12	Deputy Mayor responsible for solid waste and recycling issues

The research was conducted in January and February 2023. On average each interview lasted 60 minutes. It was carried out in the participants' native language which was Greek. Due to the fact that telephone or online interviews appear to be as reliable as face-to-face interviews (Deakin and Wakefield, 2014; Cachia and Millward, 2011) we conducted the interviews through phone calls. The participating local government officials were informed by the researchers about the purpose of the research and its goals. They were also assured that their anonymity would be guaranteed.

Table 2 Emerging topics and sub-topics

Emerging topics	*Sub-topics*
Information, communication and control networks	• Information towards citizens and businesses • Support mechanisms for circularity • Circularity monitoring and control systems • Local action plan regarding circular economy
Policies on cultural shaping	• Information centres for citizens and businesses • Campaigns to achieve deeper knowledge on circularity issues • Raising awareness of citizens, households and businesses towards circular economy options • Sensitising pupils and students
Participation incentives for households and businesses	• Incentive system (national and local) for the circular economy • Mechanisms for supporting circularity in the industries • Incentives for sorting waste materials • Incentives for reducing solid waste

3.3 Data analysis

In order to avoid ambiguities and misinterpretations, the data analysis was carried out in Greek language and then only the references used were translated into English (van Nes et al., 2010; Maneesriwongul and Dixon, 2004; Temple and Young, 2004). At first, the interviews were examined individually and inductively and afterwards were compared with each other (Thomas, 2006; Creswell, 2005). The emerging themes and subthemes (Gioia et al., 2013) were identified as illustrated in Table 2.

The categories were defined in detail and coding was both exclusive and independent (Krippendorff, 2018; Smith et al., 2001).

4 Findings

The findings were structured on the basis of three thematic sections: the section on 'information and control networks', the section on 'culture shaping policies' and the section on 'incentives for household and business participation'.

4.1 Information and control networks

In the detection of whether the local governments have formed circularity information networks for households and businesses, two facts emerged. The first element showed that the municipalities among themselves have large discrepancies in the development of information networks for citizens, households and businesses. The second element concerns the lag in citizens' sensitivity to circular economy issues due to the non-functioning of effective information and communication networks. All the information is found in some fragmentary pilot programs and in some informative events in schools.

> "To inform the citizens, we developed a pilot program of a compensatory nature. We were giving them a reward voucher. The goal is to be done throughout the municipality and to have large recycling bins and when you throw recyclable materials you will be provided with a coupon in return. Like the machines in supermarkets where you put the empty bottles in and it gives you back a price." (R7)

> "Until today, information networks for citizens have not been established. The understaffing of the Municipality significantly limits the development of actions and initiatives. The environmental department has only one employee.." (R3)

It was found that citizens usually look for information through press releases issued by municipalities and through websites.

> "They are informed through our press releases as well as through the electronic and printed press and our website." (R2)

> "For our own initiatives, we inform the citizens through the social networks, the invitations we send to local associations and the informative events in schools depending on the relevance of the action. Also, there are red bins in visible parts of the city in collaboration with a company, where clothes are collected and we give a check that can be redeemed at the social grocery store." (R8)

Looking into whether the local government has organised mechanisms to support businesses for unhindered access to financing tools in order to adapt their businesses to circularity, a diversity was highlighted. Only a few municipalities have such a structure. On the contrary, most people consider that this is not a matter of their own competence.

> "The financing to businesses for the circular economy is not the responsibility of the local government. The local government does not have such funds. It is the responsibility of regional self-government and the ministries." (R12)

> "We have a consulting support office for our citizens and especially for professionals where, through European programs, they can join actions that will strengthen the recycling of materials resulting from the operation of their business. We have an office that can help them and refer them to relevant bodies." (R2)

It was discovered that the local government does not have circularity control mechanisms.

> "We are far behind on circularity controls, even though, a few years ago, we created substantial actions to promote it. Monitoring and control mechanisms are now actually starting to be established." (R11)

> "We have not apply something like this in the municipality. It is in the future plans of the municipality." (R9)

It was found by the survey participants that the municipalities' action plan for the circular economy is at an early stage and that their operation is based on the national plan drawn up by the government.

> "Despite its importance, circularity is still at an early stage. Now it is the time that the overall concept and its impact to the economy and the environment is gradually perceived. It was only in November 2021 that the national action plan for the circular economy was revised in a more direct, concrete base, without any further dissemination to local authorities." (R3)

> "We have not yet created our own local circular economy action plan. We are operated following the national action plan. However, we need a local action plan adapted to our own particularities and that is what we intend to do in the near future." (R10)

The survey showed that citizens are not aware of the existence of the national circular economy action plan.

> "Citizens unfortunately, are not aware of the national action plan for the circular economy. The same holds for many of those that are involved in local government authorities. This is one of the many pathogens existed in the local governance." (R7)

> "Apart from a portion of well informed and sensitive to that issue citizens, most are not aware of the existence of such plans. Many foreigners who live on a permanent basis in our municipality, they're asking about circular economy plans and mechanisms, due to the different culture they deliver from their countries." (R3)

4.2 Culture shaping policies

The search for any state or local governing centre or non-governmental organisation that informs citizens and entrepreneurs about the necessity of participating in circularity

showed that such mechanisms do not exist, although it is in the intentions of the local government to create them in the future.

> "Until now there is nothing organized. We are now drawing up the strategic planning of our municipality, which will include the circular economy. We have cooperated with the University of Piraeus' circular economy department, which is preparing for us a comprehensive circular economy proposal that will concern our municipality, which will also include established structures for informing local people." (R1)

> "Such a structure does not exist in the municipality, neither by the state nor by the local authorities. It is, however, in our intentions to make substantial interventions for the circular economy. Among others, we want to support information mechanisms for local people and businesses." (R4)

The research showed that support and information mechanisms for the circular economy by the local government, are weak. That the reason that several efforts made in the past were not adopted by the citizens to a large extent.

> "We continuously organize promotional campaigns for the circular economy as well as other actions. In September (2023), we are preparing an event, dedicated to the circular economy. We had a home composter program where anyone who joined got 30% back on their cleaning fees as a reward. While we should have hundreds of applications, we didn't even have a hundred. Obviously, local people information mechanisms are urgently needed." (R1)

From the research it was confirmed that there is cooperation between the local government and the primary and secondary education schools as well as with higher educational institutes (such as universities), in order to make students more sensitive to the issues of the circular economy.

> "We cooperate with schools on our own initiative. In fact, recently we held interactive activities in the central square together with the National Recycling Organization where we also gave some prizes and gifts to our students." (R2)

> "Our cooperation with the schools of our municipality and the local university on circular economy issues is continuous and has resulted in encouraging outcome." (R5)

The survey showed that policies such as 'paying fees proportionally to the waste we throw away' have not progressed significantly on a practical level, although the participants in the survey consider these policies to be important enough.

> "I think that as we are a relatively small municipality, we are not prepared technically and theoretically, to the extent that it we should, in order to adopt this measure. I think the same is the case with the majority of municipalities in Greece. However, I think that this is the direction we should follow." (R12)

4.3 Incentives for household and business participation

The survey showed that only a few respondents reported specific motivations for citizens, households and businesses to participate in the overall context of circular economy. The incentives they reported were only for material recycling and home composting.

> "The incentives we promote as a local government, move towards two directions: Incentives to participate in material recycling and incentives for home composting." (R9)

Survey participants believe that the national strategy plan for the circular economy is moving in the right direction. It promotes the social economy and provides citizens, households and businesses with incentives, to participate in it.

> "The national circular economy action plan incentivizes participation. If implemented correctly, it will create new jobs and economic and environmental benefits. The plan set and prioritizes goals. It enables households and businesses to participate and at the same time creates a circular culture." (R6)

The research showed that there are not any common facilities or other support mechanisms that would facilitate and support recycling businesses, reducing their operational costs.

> "Unfortunately, there are no such mechanisms developed in our region so that recycling companies can use common structures that would significantly reduce their operating costs." (R6)

The research showed that from the point of view of local government there is a planning of incentives waste sorting with the aim of reducing solid waste.

> "There are incentives and specific planning, however, they need improvement. At the moment in our municipality we have such a system that collects waste materials such as rubble and pays 4 euros per ton, pruning costs, paying 20 euros per ton, bulky objects for 30 euros per ton and mixed waste, paying 57 euros per ton. Obviously there is room for improvement." (R1)

5 Discussion

In recent years, the issues of the circular economy from the local government perspective have increasingly attracted interest in Greece while certain support mechanisms have been created, but to date these tools have not been as powerful and effective as they could be. However, the development of support measures for the circular economy by local self-administrative authorities presents no uniformity and is not carried out to the same extent among all municipalities. In terms of population, small municipalities lag behind large municipalities regarding this fact. There exist differences between municipalities in the development of information networks for citizens, households and businesses. At the same time, there is evidence of a deficit in the awareness of citizens on circular economy issues due to the absence of effective information and communication networks. Additionally, the existing communication and information networks are weak and need to be upgraded and modernised as well as certain control mechanisms are required. Therefore, it is essential for local self-administrative authorities to formulate local circular economy plans compatible with the national circular economy plan. It is also very important to establish strong communication and information spots for all residents, households and entities, as well. Correlating these findings with the international literature, we observe that strong communication, information and control initiatives are needed in order to further support the circular economy (Ma et al., 2022; Padilla-Rivera et al., 2020; Abila and Kantola, 2019). In this regard, the role of local government is vital (Palm and Bocken, 2021). Research work by Rousta et al. (2020) indicated that factors such as knowledge, physical conditions, perceived barriers, motivation and several other factors have an impact on household waste sorting and on attitudes towards circularity generally. Furthermore, providing information, awareness and dissemination, both

centrally and locally, contributes to the acquisition of knowledge about the circular economy (Tang et al., 2011; Afroz et al., 2010; Chu and Chiu, 2003). The need of sensitising the public and those who deal with circular economy issues is also found in other surveys (Ilić and Nikolić, 2016; Hottle et al., 2015; Xue et al., 2010).

It is now widely understood by the local government leaders that the success of circular economy action plans requires the support of citizens, households and businesses. Thus, circularity must be supported through their daily operations. Policies for shaping a culture on these issues need to be pursued. Strong support mechanisms are also needed. Local authorities have placed great emphasis on raising awareness among pupils and students. Consequently, it seeks to raise awareness among consumers and enterprises through events, newsletters and leaflets, as well. This evidence is consistent with other surveys. According to Davidescu et al. (2020), a change in attitudes is required to pave the way for the circular economy. Further development of consciousness is needed regarding the behaviour and practices of households and businesses (Ma et al., 2022). Based on international literature, raising the awareness of children from an early age and students on circular economy issues is a key factor in shaping a specific culture related to those aspects (Owojori et al., 2022; Kirchherr and Piscicelli, 2019; Wandl et al., 2019). In addition, the study by Rousta et al. (2020) has shown that raising young people's awareness of cyclicality issues addresses attitudes and shapes the behaviours of future generations. Several other studies have demonstrated the same fact (Babaei et al., 2015; Owusu et al., 2013; Ifegbesan, 2010). On the contrary, insufficient information creates low participation (Hellwig et al., 2019) when behavioural aspects are crucial to circularity themes (Tucker, 2001; Ölander and Thøgersen, 1995). Moreover, trusting relationships with the stakeholders of the circular economy ensures consensus, partnership and creates an alternative culture towards circularity practices (Nogueira et al., 2020; Palm et al., 2019).

This research has shown that participation incentives, whether institutional or financial, certainly contribute to enhancing households and enterprises engagement in the circular economy. Relevant action plans also help in this direction. According to the international literature, incentive policies for the circular economy encourage households and businesses to participate in (Zhou et al., 2021; Liu et al., 2021; Fischer and Pascucci, 2017). Notably, the above type of incentives – as interventions – encourage households to sort waste through waste pricing (Gautier and Salem, 2023; Knickmeyer, 2020; Ukkonen and Sahimaa, 2021). Incentives are usually institutional and financial in order to foster the circular economy and especially circularity and reuse (Alvarez-Risco et al., 2022; Fischer and Pascucci, 2017; Welivita et al., 2015, Moh and Abd Manaf, 2014; Halvorsen, 2012). Among the incentives in favour of the circular economy is the creation of jobs, which was also identified in the present research (Padilla-Rivera et al., 2020). Also, based again on the international literature, system support policies such as 'pay-as-you-through' combined with facilities, high levels of household and business awareness as well as the collection of recyclable materials could reduce solid waste supporting at the same time circularity (Morlok et al., 2017; Elia et al., 2015; De Jaeger and Eyckmans, 2015). Finally, action plans related to green practices make a decisive contribution to the strengthening of the circular economy (Alonso et al., 2022; Gravagnuolo et al., 2019).

6 Conclusions and policy implications

Local self-administration plays a significant role in the transition to a circular economy. However, the entire case needs to be grounded in a well-designed local action plan that is consistent with the corresponding national action plan for the circular economy. Three elements are crucial to the effective promotion of the circular economy. The first one concerns the creation of knowledge, information and monitoring networks. The second dimension refers to the plan of creating a particular culture towards circular economy among citizens, households and businesses. Therefore, raising awareness among pupils and students is necessary for the future of circularity. The last one deals with various incentives, coming from the institutional and financial level, which later will make the circular economy attractive and interesting. In this respect, the present research highlighted the role of local self-administrative authorities in the circular economy and identified weak points and obstacles that should be overcome through specific policies.

Specifically, critical is the way the data are collected and presented, from local authorities and central administration respectively. Major changes are needed to improve the general public's trust in the validity of data, compatible with the proposed indicators by EU and OECD (Heshmati, 2017). Furthermore, strategic collaborations should be established between local authorities, enterprises, institutions (such as universities) and local society to conduct research on circularity and promote best practices of circular economy generally by taking advantage of funding programmes extracted from EU (for instance: utilising together available financial instruments under the quadruple helix approach: government – society -universities- enterprises). Publicly and EU funded programs could be combined to foster knowledge on circularity, through joint projects, focused PhD in the field, and so on. With such actions, local governments could find ways to communicate the circularity to the general public.

The findings of this research enrich the international literature and can be used by local officials who have the responsibility to formulate policies for the circular economy. At the same time, they can be useful to the local community and the business world. This research has also limitations. While it traces the current status of local government's role in the circular economy based on the views and experiences of local government executives, a similar survey could be carried out focusing on the views of the inhabitants and entrepreneurs, as well.

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