

# HUMANISTIC ENVIRONMENTAL GOVERNANCE: A NOVEL PARADIGM FOR ADDRESSING PLASTIC REDUCTION

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**Introduction/background:** Single-use plastic (SUP) products, being considered harmful to the environment and public health, are to be banned in the EU by 2021. These bans are required to be put in place by all member states. For other SUP items, member states will have to limit their use through a national reduction in consumption, either ensuring they cannot be provided free of charge, or by making alternative products available.

**Aim of the paper:** The aim of the paper is to present a grass-root action QUIT PLASTIC (<http://quitplastic.eu/>) initiated by a group of Polish scientists, as an immediate reaction to SUP elimination.

**Materials and methods:** In April-October 2019, a carefully designed platform on SUP usage was offered as an anonymous survey to be filled in by canteen/take-away style restaurant visitors, the focus being on university students in the city of Kraków (N = 80). In all, a full range of SUP was offered, with the highest representation of take-away-containers, bottles and cutlery (consecutively in 89,23%, 87,50% 60% of the locals). Representation of various SUP items was significantly dependent on the size of university.

**Results and conclusions:** In results of the research the authors discovered that none of the surveyed canteens/gastronomes displayed information about SUP environmental and health risk, some offered waste selection containers (16/80). This was more often (9/16) evident in smaller universities. A full picture of how to improve implementing and fostering the sharing of responsibility for the environment by means of humanistic approach are discussed in the paper. There are also suggested some recommendations.

**Keywords:** single-use-plastic, humanistic governance, citizen science.

## 1. Introduction

### 1.1. Plastic generation, management and policy

The alarming plastic production growth has opened a public debate about the prevailing environmental crisis. As of 2017, plastic production has increased globally to 250 million tons, generating each year about 400 million tons of CO<sub>2</sub> emissions. The dimension of the related pollution reveals a horrendous global scenario, as it is estimated that, should these rates continue, 12 000 tons of plastic will be in the natural environment by 2050 (Geyer et al., 2017). This seems to be a phenomena, not just in developed countries where the consumption linked with GDP is the highest (e.g. the EU or North America), but plastics can be tracked practically everywhere, even in the remote parts of the Arctic (Ivar do Sul and Costa, 2014). Such plastics reach land and water ecosystems in the form of micro- and nanoplastics (particles of  $\leq 5$  mm and  $< 1$   $\mu$ m in size, consequently) originating from the breakdown of larger plastic items. These particles are characterized by high surface to volume ratios and can sorb environmental contaminants (Vince, and Hardesty, 2018).

When examining the main generator of plastic waste worldwide, evidence points towards the packaging sector. Besides demonstrating the highest plastic production at 42%, followed by the building and construction sector with 19%, it is remarkable that a tremendous difference in the lifetime of end products persists (average lifetime building and construction – 35 years; packaging – typically 6 months or less). Given the global shift from reusable to single-use containers, it is not surprising that the packaging sector represents clearly the top generator of plastic waste, being responsible for almost 50% of the global total (Geyer et al., 2017). Consequently, single-use-plastic (SUP) items are considered as by far the most impactful. Despite this fact, its generation has been constantly growing around the world.

The EU Directive 2019/904 of the European Parliament and of the Council of 5 June 2019, also known as ‘Single-Use-Plastic Directive’, claims that ‘the reduction of the impact of certain plastic products on the environment’ rests upon requesting higher recycling targets and putting more responsibility on plastic producers. Following this directive, several single-use plastic products for which alternatives are easily available and affordable, will be banned from the market. These are: (1) cotton bud sticks, (2) cutlery (forks, knives, spoons, chopsticks), (3) plates, (4) straws, (5) beverage stirrers, (6) sticks for balloons, (7) food containers made of expanded polystyrene (8) beverage containers made of expanded polystyrene, (9) cups for beverages made of expanded polystyrene.

These bans are required to be put in place by all member states by 2021. For other SUP items, member states will have to limit their use through a national reduction in consumption, either ensuring they cannot be provided free of charge, or by making alternative products available. These include ambitious targets for separate collection of SUP beverage bottles of 90% by 2029 (77% by 2025), as well as targets to incorporate 25% of recycled material in SUP

beverage bottles as from 2025 and 30% as from 2030 (European Commission Directive 2019/904, EURlex Document 32019L0904).

In accordance, many businesses have already committed to align their policies, as stakeholders have increasingly required them to share environmental responsibility. However, despite declared environmental efforts, public skepticism persists – referring to scandals of ecolabelling or greenwashing in the past decades. According to Lischinsky & Egan Sjölander (2014), “corporate voices make substantial use of environmental and ecological arguments in their strategic communication, but they provide little useful information about the company's impact and do not usually foster forms of dialogic stakeholder engagement”.

Do plastics make us sick? Every day we are exposed to different kinds of plastic and there is no complete understanding of its effects on human health. However, in view of more definite scientific evidence on already assessed impacts of plastic waste to the natural environment and public health, a tremendous asymmetry persists between citizens' needs followed by so far the extensive and still growing consumption, and the prevailing strategies of policy-makers and business entities (Hoggan, 2016). Unfortunately, a lack of clarity persists of how to develop concrete and sustainable strategies to meet the upcoming regulations, from both the economical and social point of view. Certainly, plastic elimination cannot be completed without the alteration of so far plastic governance to a more humanistic approach covering public understanding, awareness, participation, shared responsibility and, eventually, decision-making.

## **1.2. Does a humanistic type of governance matter in plastic reduction?**

The first article of the Rio Declaration of the United Nations on Environment and Development states: “Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with Nature” (UN, 1992). A humanistic perspective directs the focus on the human being, and it underlines simultaneously the need for respect for every living entity and for the whole of Nature. It encourages people to act with a sense of stewardship towards Nature and promotes the sustainable development of humanity characterized by a respectful attitude toward the ecosystem (Mele, 2012). In contrast to the *homo oeconomicus* conception, it directs the view towards value-based social interactions. Herein, people represent the means, but also the aim in themselves of establishing this attitude. Following this, humanistic governance is rather based on an intrinsic motivation to serve humanity than being fixed to preconceived utility functions. Accordingly, decision-makers aim at long-term relationships where their interests, needs and wants take shape through discourse and continuous exchange with all involved entities. As such, the ultimate goal is not determined by the maximization of the utility for specific groups of interest, but balances the interests of all impacted stakeholders in accordance with universally applicable principles (Pirson & Turnbull, 2010).

### **1.3. Knowledge co-creation and citizen science as an immediate tools to humanistic plastic governance**

Following this, policy-making can no longer be content to “push” laws or regulations onto the society, but must instead take into consideration citizens’ interactions and involve them in the research, design and implementation stages of strategic decision-making. Referring to diverse management approaches of co-creation of value (Bhalla, 2011; Prahalad, and Ramaswamy, 2010), we emphasize that close cooperation between policy-makers and the general public fosters the potential of synergy effects. Correspondingly to studies on customers’ engagement into design and production stages (Ballantyne, 2004), we argue that the engagement of involved interest groups enables not only an interactive process of mutual learning, but also represents a desirable goal in view of the highlighting of different points of view and identifying the needs and wants of the different parties involved (Lusch, and Vargo, 2006). Hereby, citizens’ involvement mobilizes the resources of the entire society and the co-creation process generates transformational impacts. Finally, the implementation of co-creative processes sets in motion a process of profound change in a society where citizens are at the center of the process.

The spectrum of citizen participation ranges among different levels of participation and thus influence, from being informed, to the transfer of responsibility (empowering). Structured citizen participation incorporates all citizens' aspirations and concerns, and ensures that relevant aspects are understood and taken into account in the participation process. In a more developed form of citizen participation, politics and administration act as partners of the citizenry, who work together as an alliance on alternatives towards a preferred common solution (Wouters et al., 2011). Balanced and objective information is, therefore, the basis of citizen participation defined often more broadly as a separate discipline – citizen science (CS).

Recently, citizen science has faced remarkable blooming and change, resulting in a growing number of projects in diverse disciplines followed by a shift in its original role from an additional research tool, to an independent research paradigm (Bonney et al., 2014; Cooper et al., 2018). Moreover, beside the evident intrinsic value of CS in the educational field, it has been evaluated in the context of transformative learning in which participants reinterpret the sense of experience for the construction of meaning and learning (UNESCO, 2015).

In the era of novel communication technologies, CS has been engaging a steadily growing portion of the public, predominantly in the basic domains such as environmental sciences. Coincidentally, non-professionals construct with and for academia a new tool to effectively shape a new type of policy governance, not only empowering citizens, but also making researchers more obliged than ever before to decide upon the state of the natural environment, this time collectively (Grodzińska-Jurczak, 2019). Keeping in mind the ethical obligation of scientists to communicate and speak out against major disturbing environmental facts to the general public, academia should especially acknowledge their responsibility, preferably in co-operation with Citizen Scientists, stating example and raise awareness using all available channels

(Grodzińska-Jurczak et al., 2020). Still, the current degree of co-operation among academic and non-academic sectors, although improving, leaves a lot to be desired. Consequently, good cases of a fully trustful and effective collaboration are lacking.

#### **1.4. Goal of the study**

Here, we present the results of a grass-root initiative QUIT PLASTIC (NIE! DLA PLASTIKU) (<http://quitplastic.eu/>) developed and operated by a group of four Polish scientists and students at the Institute of Environmental Sciences, Jagiellonian University in Kraków, Poland, as an immediate reaction to how to effectively implement reducing and preventing the impact of Single-Use-Products on the environment and human health. Its primary aim was defined as raising public attention to how the number of SUP enumerated in the EU Directive are actually realized on a daily basis by engaging them in participatory action to examine if and which SUP products are offered in the gastronomic locals they visit. A full picture of how to improve implementation and foster sharing responsibility for the environment are deeply discussed and recommendations suggested.

## **2. Methodology**

A carefully designed bilingual (Polish and English version) platform ([niedlaplastiku.pl](http://niedlaplastiku.pl); <http://quitplastic.eu/>) on SUP usage in Polish gastronomy locals offers an anonymous, short survey to be filled in by restaurant visitors. The survey comprises closed and open questions on type (chain/private/college canteens), category (restaurant/café/bar/others) of business, locality (province and size of village) and type of SUP offered. We asked about: (1) the type of containers (cups) beverages are served in, (2) optional items that accompany drinks (straw, stirrer), (3) type of containers (bottle, can) the drinks on offer come in, (4) type of container take-away is offered etc., (5) availability of information of plastic effect on the environment (see [https://docs.google.com/...](https://docs.google.com/)).

In our study, we focused on two parameters (the presence of SUP/substitutes and university size). Yet, we were aware that other attributes such as location, specialization, educational scope and number of food establishments may have related implications. This paper seeks to make a step towards their exploration.

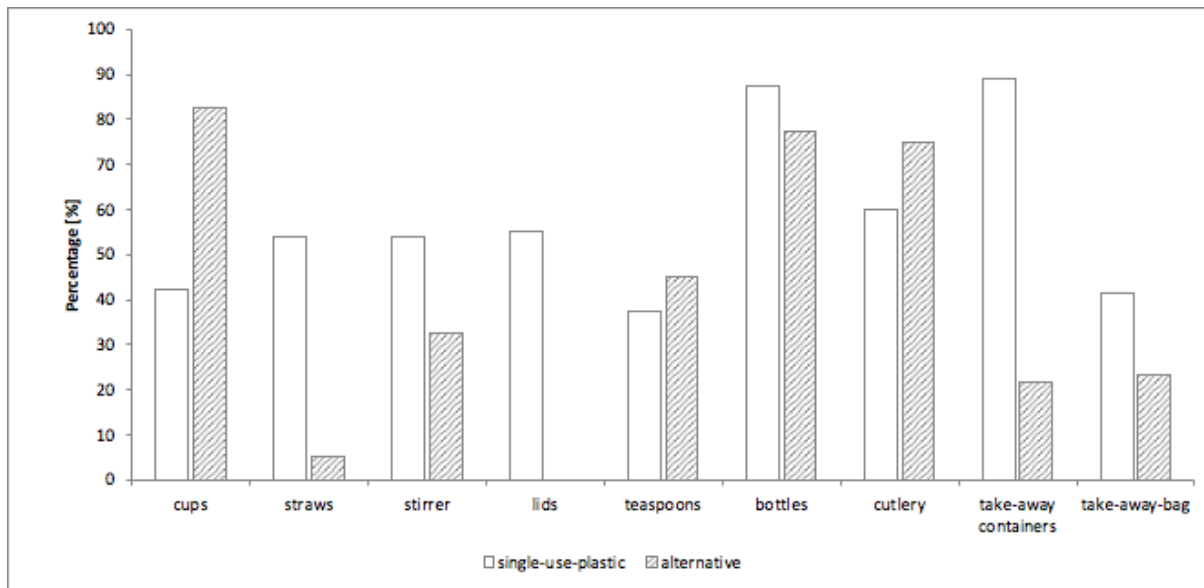
### 3. Results

Over 6 months operation (April-October 2019), the project's page was visited 8 471 times, followed by over 361 in total questionnaires returned. 'Quit plastic' received the patronage of the City Council of Kraków, Jagiellonian University and other public, private and NGOs institutions. In a considerable short period of time the action received the interest of radio and TV stations, as well as newspapers of local, regional and national outreach (23 articles in the daily press, 6 radio and several notes) and gained a few public and private supporters. It resulted in setting up a multi-actor network willing to act for plastic reduction.

Over 80 dining establishments (canteens) located at all universities (awarding degrees up to M.Sc.) in the city of Krakow – both public and private, were assessed. Hereby, the focus has been laid on the presence of SUP items/substitutes and related university size effects. For analytical distinction, we compared 'larger' versus 'smaller' universities, wherein size is defined as the number of students enrolled. Hereby, group 1 was defined by universities which enrolled over 20 000 students (N = 46); group 2 by universities which enrolled below 20 000 students (N = 34). The total sample covered all existing dining establishments located on/near university property in Kraków (N = 80). In the case of take-away offer, we considered 65 canteens, as such was not included in the offer of 15 (N in group 1 = 37; N in group 2 = 28).

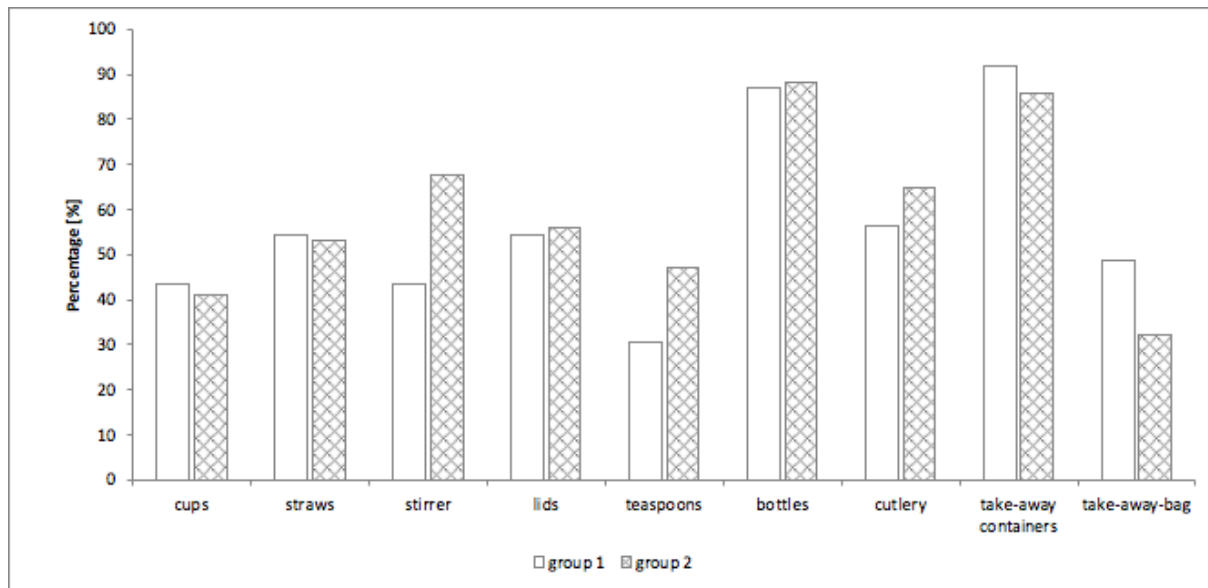
In the surveyed canteens/gastronomes, SUP consisted of all 10 items (cups, straws, stirrers, teaspoons, lids, bottles, cutlery, bags and containers-to-go) but in a different range, namely: cups were proffered in 42,25% of the locals, straws in 53,75%, stirrers in 53,75%, teaspoons in 37,5%, lids in 55%, bottles in 87,50%, cutlery in 60%, whereas take-away-containers and plastic bags were provided by 89,23% and 41,54% of all canteens/gastronomes, respectively (Figure 1).

Alternatives to SUP items were offered as different types of cups: non-plastic reusable cups, paper single-use-cups and reusable cups brought in by clients, along with straws, stirrers, teaspoons and cutlery sequentially in 71,25%; 50%; 37,50%; 5%; 32,5%; 45% and 75% of all canteens/gastronomes, respectively. In the majority of surveyed locals, beverages were offered in non-plastic containers such as glass bottles (85%) and aluminium cans (53,75%). Alternatives to take-away containers and bags were provided in only 21,54% of all surveyed canteens/gastronomes, whereas none (0/80) of the eating establishments offered substitutes for SUP lids (Figure 1).

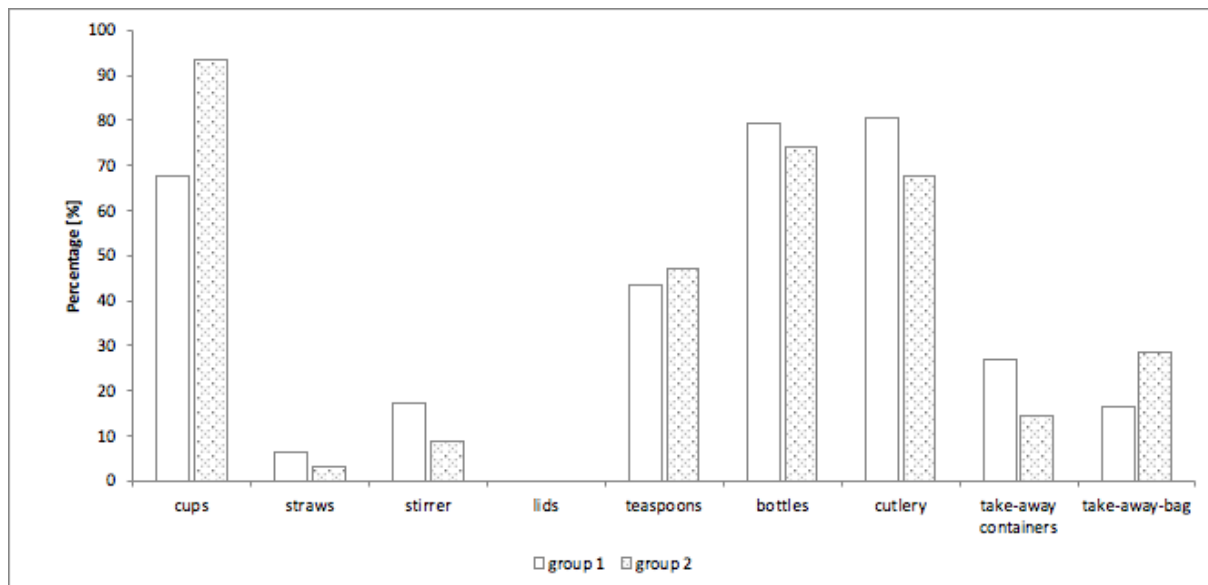


**Figure 1.** Occurrence of SUP items and alternatives in canteens/gastronomes of universities, incl. take-away offering [%].

The analysis showed a dependency between the distribution of Single-Use-Plastic items (cups, straws, stirrers, lids, teaspoons, cutlery, take-away-containers, bags) and the size of the university. In ‘larger’ universities (group 1), there were more single-use plastic cups (43,48%) and plastic straws (54,35%) proffered than in group 2 (plastic cups – 41,18%, plastic straws – 52,94%) (Figure 2). Meanwhile, there were more alternatives to SUP straws (6,52% vs. 2,94%), cutlery (80,43% vs. 67,65%), stirrers (17,39 % vs. 8,82%), reusable cups brought in by clients (41,30% vs. 32,35%) and non-plastic reusable cups (73,91% vs. 67,65%) (Figure 3). In ‘smaller’ universities (group 2), there were more single-use plastic stirrers (67,65%), plastic teaspoons (47,06%), plastic lids (55,88%), plastic cutlery (64,71%) and plastic bottles (88,24%) than in group 1 (plastic stirrers – 43,48%, plastic teaspoons – 30,43%, plastic lids – 54,35%, plastic cutlery – 56,52%, plastic bottles – 86,96%) (Figure 2). In ‘larger’ universities (group 1) there were more alternatives to SUP such as teaspoons (47,06% vs. 43,48%), glass bottles and cans (79,41% vs. 73,91%) and paper single-use-cups (55,88% vs 45,65%) than in ‘smaller’ universities (group 2) (Figure 3).



**Figure 2.** Occurrence of SUP items in canteens/gastronomes depending on the size of university (group 1 – over 20 000 students; group 2 below 20 000 students) [%].



**Figure 3.** Occurrence of SUP alternatives items in canteens/gastronomes depending on the size of university (group 1 – over 20 000 students; group 2 below 20 000 students) [%].

In the take-away offerings of ‘larger’ universities (group 1), there are more single-use plastic containers (91,89%) and plastic bags (48,65%) than in group 2 (plastic containers – 85,71%, plastic bags – 32,14%). Furthermore, in group 1 there are more alternatives to SUP containers (27,03% vs. 14,29%). In the take-away offerings of ‘smaller’ universities, in contrast, there were more alternatives to SUP bags (32,14% vs. 16,22%) than in group 1.

No canteen/gastronomes, however, displayed information about SUP, and recycling bins were only available in 20% of all the canteens/gastronomes that were assessed. Of note, most of these (9/16) were located in smaller universities (Group 2).



## 4. Discussion

Single-use-plastic beverage and food containers (including take-away offerings) are of significant concern as they impact upon the environment and harm human health, not only in terms of entering our food chain in the maritime environment, but also through our direct exposure to harmful substances via the consumption of liquids and food. Although the level of exposure to plastic varies depending on several factors, most of us experience persistent exposure to multiple compounds proven to be hazardous to human health (Anbumani and Kakkar, 2018). In addition, according to the Environmental Defense Fund, methane, which is being released during the related decomposing, shows an even higher impact on the environment than carbon dioxide (Alvarez et al., 2018).

Against this background, and as universities represent places where good practices should originate from, the analysis of the gathered results shows rather an opposite scenario than we expected. The majority of the examined canteens/gastronomes showed well-established offerings of different kinds of SUP items, and, what not fully understandable, limited recycling options, as well as no information about the harm of plastic or on upcoming legislation. Although the offering also includes alternatives in case of beverage cups (even to a higher amount than the corresponding SUP offering), conclusions can be misleading. Due to the systemic circumstances, in the majority of Polish waste management installations, alternatives produced mainly of natural resources such as e.g. thermoplastic starch obtained from potato as polylactic acid (PLA) are not perceived as bio-waste and instead of composting they are most often incinerated or landfilled. The same applies to paper cups - which are lined inside with plastic or wax to ensure waterproofness.

Recently, as a follow up of the plastic directive, various proposals were put on the table as substitutes for SUP products. These are fabricated from bio-based and biodegradable materials – PLA, PHAs, bio-PET, bio-PE, PEF, bio-PP, bio-PAs, PTT originating from sugarcane, sugar beet, corn, potato and wheat. However, the production of cups from natural based material is usually less resource efficient referring to raw material and energy used. Moreover, referring to the example of paper, the natural functions of trees, namely, the absorption of carbon dioxide, production of oxygen and filtering of groundwater can no longer be performed when the trees are removed from the ecosystem. Of further concern, Bisphenol A (BPA), classified as an endocrine disruptor and correlated with disruptions in fertility, reproduction or sexual maturation (Gore et al., 2018; Bergman et al., 2013), has been found in many paper products, including paper cups, possibly due to production lines using BPA resin-lined parts. Furthermore, the glue used to hold regular cups together partially dissolves when hot liquid is being poured in, releasing trace amounts of toxins, such as melamine (Roger, 2013).

Studies investigating organizational size effects on the prevalence of practices related to social and environmental responsibility reveal that while large organizations tend to extensively inform about socially relevant matters, corresponding engagement stays limited (Delmas, and Burbano, 2011; Lyon, and Montgomery, 2015). Although smaller organizations may face size related challenges (i.e. lack of resources, lack of possible economies of scale), while simultaneously often experiencing less public pressure (Jenkins, 2004), some studies reveal evidence that smaller organizations are capable of engaging effectively in activities related to social and environmental responsibility. However, due to a lack of reports or corresponding statements for external audiences, the visibility of their engagement often remain limited (Brammer et al., 2012). Although observing some tendencies for single items, our results do not imply a significant dependency between the size of the universities and their engagement in environmental governance. All examined educational institutions showed similar amounts of SUP and alternative items, independent of their affiliation to our size dependent samples.

Deriving from the above-described matters, the sole act of shifting to materials based on natural resources does not represent a sustainable solution. Moreover, keeping in mind that the majority of the so far established means have simply failed the target of halting plastic production increase (Zheng, & Suh, 2019), the need for a novel environmental more holistic collective governance instruments to address this problem becomes obvious.

## 5. Conclusion

The presented study is novel in the context of prognosing how systemically gastronomic locals are or are not prepared for the implementation of the EU legislation on national or local level. We, as an academic team working on SUP, have already been extending our research to the entire city of Kraków, to be able to show what are the trends of SUP occurrence outside of the academic niche. However, further and more detailed studies at the level of the EU are definitely required.

Following the discussed insights, this paper calls for a systemic rethinking of plastic governance among decision-makers, in the case of universities and the higher education sector in general. Beside the obligation to speak out and inform the public, academia is expected to serve as a good example, to take action and advocate to the best of their ability in the interest of the broad society. This involves not only advancing awareness about the possible impacts of prevailing environmental trends, but also being socially responsible with regard to environmental governance, taking into consideration upcoming legislation. This includes, among others, sustainable decision-making in the course of tender processes for dining establishments operating in general, but in the first instance, located at educational institutions.

Given the described impact of plastic items on the environment and public health, the requirement should clearly include a shift from the offering of single-use-plastic items to corresponding substitutes, and, even more importantly, a strong advocacy towards shifting to a multiple-use glass, ceramic or metal items. Hereby, we recommend integrated multi-channel and multi-way communication such as displayed information about SUP items and suggested solutions, statements on the website and social media and broad information campaigns. These norms need to be implemented as systemic solutions. Hereby, a sustainable communication approach presumes the translation of scientific knowledge into easily understandable information, speaking the same language as the public, to inform, to raise awareness, but also to motivate and engage. Moreover, and crucial, academic peers should also act, in the first instance, as citizens who need to share responsibility for the environment as a common good (Grodzińska-Jurczak et al., 2003; 2006).

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