

## SUSTAINABLE CONSUMPTION AMONG CHILDREN IN THE ASPECT OF WASTE MANAGEMENT

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**Purpose:** The aim of the study was to identify consumption patterns among children. The article analyses the concept of sustainable consumption, focusing on children's consumption behaviour patterns in the field of sustainable waste management.

**Design/methodology/approach:** The paper uses a critical analysis of the literature and survey research based on a prepared questionnaire. The survey was conducted among 1326 children in age groups from 9 to 15 years old. The questionnaire consisted of two parts, i.e. the substantive part and the respondents' particulars. The first part of the questionnaire contained a set of questions concerning e.g. children's ability to identify products with better environmental parameters, behaviours related to nutrition, saving, shopping, spending free time, waste management and implementing pro-ecological solutions in their households.

**Findings:** The survey conducted among young consumers primarily pointed to the shortcomings of knowledge on waste segregation. Despite the fact that the vast majority declare that waste is collected selectively in their homes, they are unable to correctly indicate what type of waste should be thrown into the appropriate bins. Therefore, it is recommended that in each school, both primary and secondary, there are containers for selective waste collection, along with a description and instructions on what kind of waste should be placed in them. Undoubtedly, this will increase the ecological awareness of children and teach pro-ecological behaviour.

**Practical implications:** Modification of primary school curricula to a greater extent emphasizing content related to the principles of sustainable consumption in the area of rational waste management.

**Social implications:** Shaping sustainable consumption patterns among children by building awareness of appropriate behavior in the field of post-consumer waste management.

**Originality/value:** The article presents the current state of knowledge on consumption patterns among children in the area of waste management. This is a particularly important issue in the context of shaping sustainable consumption patterns among the surveyed group of market participants.

**Keywords:** sustainable consumption, food products, a child as a consumer, food market, ecolabelling.

**Category of the paper:** Research paper.

## 1. Introduction

Sustainable consumption is one of the current, significant problems present in both scientific and public discourse as well as in economic practice. It is an indispensable element of the implementation of the concept of sustainable development to the daily practice of functioning of consumers in the market. In the literature on the subject, it is defined e.g. “as market activity of consumers contributing to the generation of positive economic, social and environmental effects (the triad of sustainable effects) through the conscious and responsible purchase and consumption of goods and services” (Kazmierczak-Piwko et al., 2022). Creating it as a kind of “natural” habit requires a number of actions from an early age in the socialization system of young generations by providing them with models of sustainable market behaviour by providing knowledge, skills and competences in the area of choosing products with probably a better relationship with the environment, proper consumption and, what is very important, proper waste management. This is essential in times of their significant accumulation and the resulting problems. Waste management is regulated by many legal provisions and has a significant impact on the daily lives of citizens, among other things, by motivating them to segregate the waste they produce. Proper waste segregation is a very important element of waste management, as it allows achieving a high level of preparation for reuse or recycling. Waste sorting is nowadays a crucial and lively discussed issue, which is why it is worth analysing this problem, if only because of the goal of increasing public awareness of the principles of operation of sorting plants. Municipal waste is a growing problem, both ecological, regarding its negative impact on the environment, and economic, related to its collection, transport and disposal.

## 2. The importance of waste management in the implementation of sustainable development goals – discussion

Sustainable consumption understood as consumption in accordance with the principles of sustainable development is currently an important and topical topic of debate in public and scientific discourse. In the public discourse, the debate seems to be primarily about international cooperation in the field of legal instruments of influencing the market and issues related to

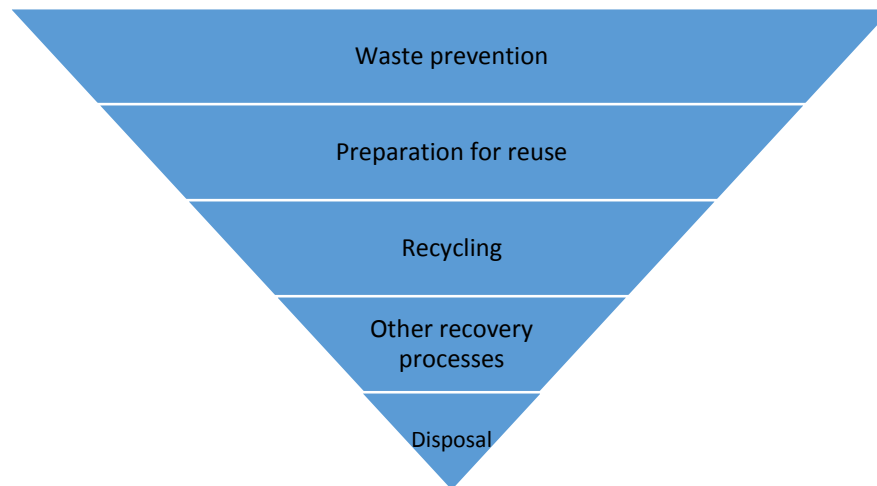
broadly understood environmental protection and respect for human rights. On the other hand, as noted by Schrader, U., Thøgersen, J., there is a debate on which of the factors, i.e. the context understood as the availability and attractiveness of alternatives, or perhaps individual values, attitudes and motives of consumers, are more important for changing their behavior towards those consistent with principles of sustainable development. These authors also draw attention to non-consumer factors related to direct and indirect government policy in this area, affecting the very context of consumption (Schrader, Thøgersen, 2011). On the other hand, sustainable consumption among children, which is addressed in this article, is becoming an increasingly important issue due to the perspective of a young group of consumers. Research in this area has been O'Neill, C., Buckley, J. (2019), paying attention to socio-structural factors and sustainable consumption at home, these authors, however, analyzed only children participating in the so-called green schools, i.e. units in which environmental issues are assumed to be more intensively emphasized compared to schools with "traditional programs" (O'Neill, Buckley, 2019). Donovan (2016) explored how children understand sustainable consumption through research on participatory activities and co-designing visual narratives (Donovan, 2016). Hadjichambis A.Ch. (2015) analyzed the effectiveness of an education program aimed at familiarizing children with the concept of sustainable consumption, focusing on environmental representations and decision-making (Hadjichambis et al., 2015). According to Phipps M. et al. (2013), a linear approach based on the VBN (Value-Belief-Norm) model, which conceptualizes behavior as a result of personal norms, developing from antecedent values and beliefs, contributed to the understanding of sustainable behavior. In this context, the impact of factors creating beliefs and values based on environmental education processes seems to be important (Phipps et al., 2013). In this context, it seems crucial to search for universal instruments for the implementation of promoting and shaping sustainable consumption based on a multifaceted impact, especially on young consumers, through environmental education shaping both the context as a result of building environmental awareness of future decision-makers and business managers and influencing the level of environmental awareness among future adult consumers products and services. In this context, international cooperation focusing on the unification of goals and methods of sustainable consumption on a global scale should be of key importance.

The modern world is facing increasing environmental challenges. Climate change, limited resources and the growing amount of waste make the idea of sustainable development more and more important. Sustainable development as a concept of global development is a doctrine of political economy that assumes the quality of life at the level, which is provided by the current civilization development (Gadomska-Lila, Wasilewicz, 2016). This concept is derived from "eco-development" and is defined as the ability to make responsible decisions regarding the use and allocation of resources to meet today's needs and ensure that the needs of future generations are met (Ozili, 2022). The first definition of sustainable development appeared in 1987 in the United Nations report (Brundtland Report), and the clarification of the concept at the Earth Summit in Rio de Janeiro in 1992 made it a description of the most appropriate economic and

social behaviour towards the environment. The idea was disseminated by adopting the principles contained in the “Global Action Program - Agenda 21” (Zakrzewska, 2019). Sustainable development is a multidimensional concept and refers to systems such as society, economy and environment. An important element of a sustainable system is also waste management. The European Union’s interest in these issues increased in the 1970s, and the reason for these considerations was, among the others, population growth, urbanization, industrialization and economic development generating increasing amounts of waste. These considerations quickly took the form of legal regulations in the form of Council Directive 75/442/EEC of 15 July 1975 on waste (Kostecka, Koc-Jurczyk, Garczyńska, 2016). The development of interest in the subject was also influenced by the newly emerging legal acts as well as educational programs that promote proper waste management. As the literature on the subject demonstrates, the production of municipal solid waste by 2050 may reach 2.6 billion tons per year, and the effects of inefficient management may cause a number of damages to public health (Okedu, Barghash, Nadabi, 2022). These damages can be divided into physical, biological, non-infectious and psychosocial health risks (Fadhullah et al., 2022). The accumulation of waste can also cause a number of environmental risks, such as groundwater pollution, air pollution and soil contamination. Waste is also a breeding ground for birds, rodents, insects and anaerobic microorganisms. Biochemical transformations that waste undergoes may affect the environment through such decomposition products as sulphides, carbon dioxide, methane, organic acids or aldehydes, which may result in intensification of global warming, acid rain or depletion of the ozone layer in the atmosphere (Kostecka, Koc-Jurczyk, Garczyńska, 2016). A conscious and responsible waste management strategy is therefore a key element of sustainable development.

In the light of the Waste Act, waste is “any substance or object which the holder disposes of, intends to dispose of or is obliged to dispose of” (Act of 14 December 2012 on waste). In the light of the directives implemented within the scope of the provisions of the Act and waste, the basic classification divides it into hazardous waste and non-hazardous waste. Hazardous waste is medical and veterinary waste, waste containing e.g. asbestos, mercury, cadmium or selenium, waste oils, electronic and electrical equipment, used batteries, batteries and plant protection products. Non-hazardous waste includes municipal waste, packaging waste and waste from industrial activity and its infrastructure (Act of 14 December 2012 on waste, Journal of Laws 2022.699).

The principles of sustainable municipal waste management in the European Union aim to reduce its negative impact on the environment and human health, and also ensure the improvement of resource efficiency. The waste management hierarchy was introduced in Directive 75/442/EEC and applies to all member states of the European Union (Figure 1). It recommends the desired sequence of actions in relation to waste management.



**Figure 1.** Waste management hierarchy.

Source: Council Directive of 15 July 1975 on waste (75/442/EEC), EU Journal of Laws of 25 July 1975.

The preferred, rational action is the action located higher in the hierarchy, i.e. waste prevention in the first place, then preparing for re-use, recycling, other recovery methods (e.g. energy recovery), and disposal is located at the very end. The long-term goal of modern and pro-ecological waste management is to transform societies into recycling societies that use waste as recovered resources and strive to reduce its amount (Widad et al., 2022). In the case of problems with accumulated waste, recycling becomes a key issue. According to the provisions of Polish legislation, i.e. the Act of 14 December 2012 on waste, recycling is understood as “recovery under which waste is reprocessed into products, materials or substances used for the original purpose or for other purposes; this includes the reprocessing of organic material (organic recycling) but does not include energy recovery and reprocessing into materials to be used as fuels or for earthworks”. As noted by Satpute, S.K., Płaza, G.A. and Banpurkar, A.G. “According to the analysis, recycling and incinerating the more than 2.5 billion tonnes of waste produced annually in Europe currently captures only about 5% of the original raw material value” (Satpute et al., 2017). The implementation of the principles presented in this chapter to everyday, habitual, sustainable behavior of young consumers requires systemic provision of knowledge about, among others, issues of waste management and its role in the sustainable development process. Undoubtedly, for this process to be effective, it should take place from the earliest years of school education. In this context, the work of Janusz Nowak (2017) is very interesting, the aim of which was, among others, to an attempt to assess to what extent issues related to sustainable development include the content of the core curriculum of general education. In his work, the author also indicated the tasks for teachers who are to conduct education, guided by the principles of sustainable development. Nowak noted that “Intensifying the pace of this development and its dissemination in society requires the creation of a new category of citizens - sustainable consumers and producers, for whom ecological and social goals are as important as economic goals. To achieve this, it is necessary to conduct an appropriate educational policy” (Nowak, 2017). Whereas P. Maddox, C. Doran,

I.D. Williams, M. Kus (2011) in their article examined the theory of intergenerational influence in relation to school education about waste (Maddox et al., 2011). A.R. Shaheen Hosany, Sameer Hosany, Hongwei He reviewed research on sustainable child behavior. Their important and current work synthesizes the core themes of sustainable child behavior into an organizational framework and offers implications for theory, policy, and practice. In their article, these authors recognized the importance and interplay of family and other socialization factors in shaping sustainable behavior (Hosany et al., 2022).

### **3. Research methodology**

The main objective of the study was to identify patterns of behaviour among children, e.g. in the context of waste management, when the products they consume enter the “post-consumer” phase, becoming waste. In this aspect, the research process focused on factors related to the recycling process, such as determining the motivators influencing the decision to segregate waste as well as identifying the reasons for not segregating waste by the surveyed group of children.

The survey was conducted among 1,326 children from primary schools in the age groups from 9 to 15 years old. The questionnaire consisted of two parts, i.e. the substantive part and the respondents' particulars. The first part of the questionnaire contained a set of questions concerning e.g. children's ability to identify products with better environmental parameters, behaviours related to nutrition, saving, shopping, spending free time, waste management and implementing pro-ecological solutions in their households. The particulars sheet took into account such characteristics of the respondents as: gender, age, place of living. The question was open-ended, allowing the respondent to give a short answer. The developed questionnaire was tested on a sample of 35 people (respectively 5 in each age group), which allowed verifying the correctness of the questions and variants of the answers provided.

The surveys were random-stratified. The strata reflected the different age groups of the respondents (7 successive years of students). The selection of students was random. As a result of the conducted research, 1326 correctly completed questionnaires were obtained in the electronic version. With the adopted confidence level of 99% and the standard error of 5%, the minimum sample size is 622 respondents, which is much lower than the number obtained as a result of the undertaken process of their collection.

## 4. Findings

The respondents were asked to assign the types of waste to the appropriate colour of the container. 851 schoolchildren (64.2%) correctly identified the colours of the containers, 475 (35.8%) of the respondents incorrectly identified the colours of the containers assigned to individual waste groups. In table 1 schoolchildren's answers are presented depending on the colour of the waste container.

Pupils had the greatest difficulty in correctly marking the container for mixed waste, nearly half of the respondents (47.3%) incorrectly indicated the type of waste that should be placed in it. The least trouble was the identification of waste that should be collected in blue containers; 1,065 schoolchildren declared it a paper container. Table 1 shows the children's detailed answers and how the colours of the containers were assigned to the individual waste.

**Table 1.**

*Identification of container colours by the surveyed group of young consumers [in%]*

Container colour	Correctly identified	Incorrectly identified
Blue	80,3%	19,7%
Green	53,9%	46,1%
Brown	62,7%	37,3%
Black	52,7%	47,3%
Yellow	71,4%	28,6%
Total	64,%	35,8%

Source: own study based on conducted research.

**Table 2.**

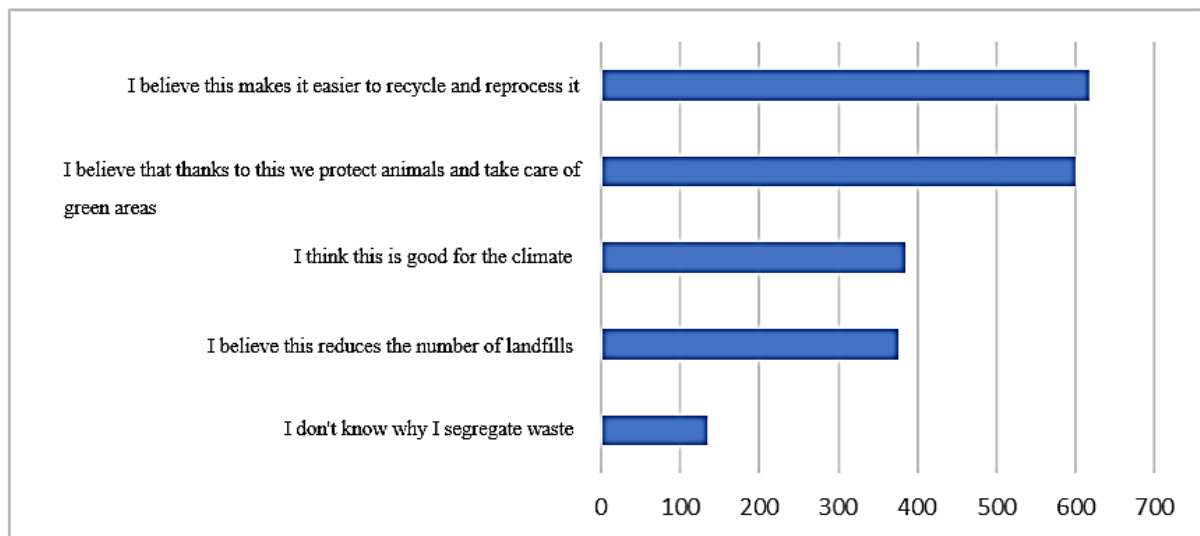
*Detailed identification of container colours by the surveyed group of young consumers [in%]*

Waste type	Container colour				
	blue	green	brown	black	yellow
Paper	80,3	1,7	1,7	1,1	8,5
Glass	5,8	53,9	2,8	4,4	9,6
Plastic/metals	6,0	4,5	4,2	8,4	71,4
Organic waste	0,6	5,8	67,2	8,2	2,3
Mixed waste	0,7	29,1	12,0	52,7	1,9
I don't know	6,6	5,0	12,1	25,2	6,3

Source: own study based on conducted research.

In the survey, schoolchildren were asked to identify the main types of waste containers. It may be surprising that more than ¼ of the schoolchildren marked the answer "I don't know" with the waste that should be placed in the black container. The content of the blue container is for plastic and metals. Even more mistakes, because as many as 386 children incorrectly identified the purpose of the green container, indicating that it is a container for organic waste. In addition, the respondents were also asked whether they disposed of used batteries in special containers. 78.43% of respondents declared that they segregate batteries properly, and 21.56% replied that they did not use appropriate containers.

Striving to minimize the amount of waste and achieve a high level of its segregation is currently a serious challenge for every local community, also because it is in line with the postulates of intergenerational justice, considered to be the core of the idea of sustainable development in its modern understanding (Dacko, M., Dacko, A., 2018). Waste segregation is still a big problem for the possibility of selective waste collection. The awareness and knowledge of people in the field of caring for the natural environment is increasing. More and more people are convinced of the need to segregate their waste, but each of them could have been guided by other factors in making the decision.



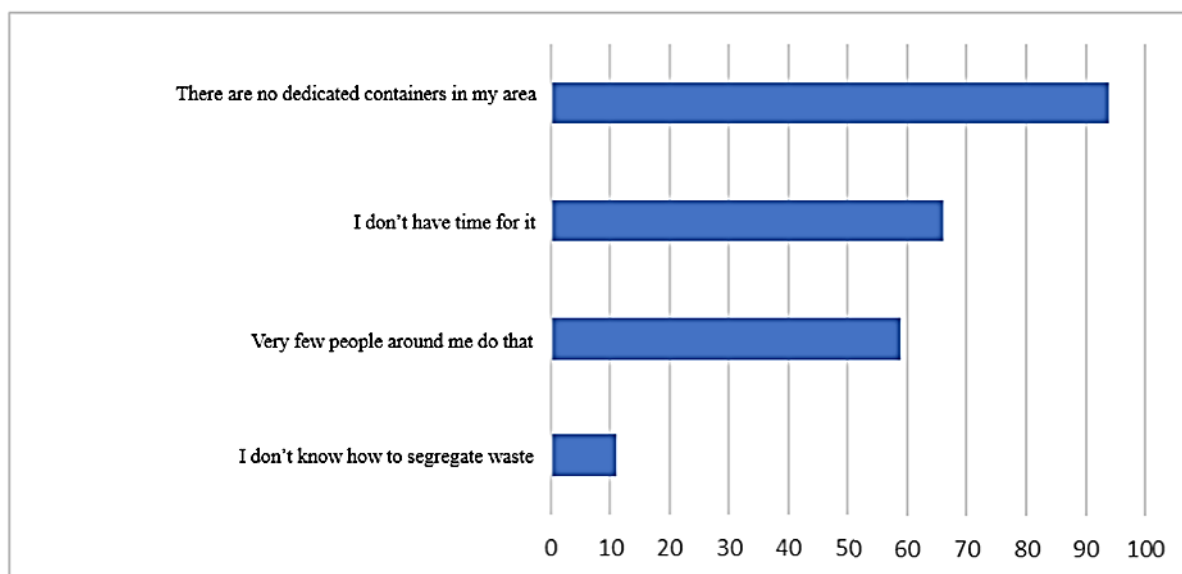
**Figure 2.** Declared factors affecting the decision on waste segregation by young consumers.

Source: own study based on research results.

Nearly 80% of schoolchildren declare that waste is sorted in their homes. The chart below shows the reasons behind them. Respondents could comment on why they segregate waste. It is encouraging that 617 schoolchildren, which constitutes 58.9% of all answers, claim that thanks to selective collection of waste, it is easier to recycle and reprocess the product. The next place was taken by the statement that “thanks to this, we protect animals and take care of green areas”, such an answer was given by 600 respondents (57.3%). Only 36.6% of children believe that selective waste collection can contribute to improving the climate. A lot of schoolchildren segregate waste in an “automatic” way – 134 children (12.8%) do not know why they segregate waste.

Not everyone declares that they segregate waste. When asked why they do not conduct selective waste collection, respondents most often emphasize that there are no containers for this purpose in the vicinity of their place of living (48%). Pupils’ lack of willingness to segregate waste is also motivated by the fact that they do not have time for it or lack of influence from the environment, because few people they know make such a selection. 11 people also indicated that they did not know how to properly segregate waste, which is confirmed by Tab. 1.2. on identifying the colours of the containers by schoolchildren.





**Figure 3.** Declared factors affecting the decision not to segregate waste by young consumers.

Source: own study based on conducted research.

An important argument in favour of waste segregation is, obviously, environmental protection. Sorting waste and the subsequent recovery of various raw materials from it is an effective method to prevent the gradual overflow of landfills. Recycling also allows us to significantly reduce the consumption of various types of natural resources. Waste segregation is not only to protect the natural environment, but also a way to save money. The waste we produce every day is an excellent source of so-called secondary raw materials, i.e. those that can be reused. Packaging made of metal, glass, cardboard, plastics – all can be processed and obtain measurable economic and environmental profits.

## 5. Conclusion

Waste management is an important element of the contemporary environmental policy of each country. Poland, as a member of the European Union, is obliged not only to introduce its own waste management regulations, but also to comply with and implement community regulations, which are designed to ensure the balanced development of the natural economy. The multiplicity of changes, new obligations, imprecision in the law may cause problems in the proper implementation of the new requirements, and thus may have a negative impact on our environment. Moreover, the complexity of regulations may result in behaviour consisting in circumventing new obligations imposed by law. Therefore, it seems important for the state to rationally approach the issue of waste management and regulate these issues in such a way that they can be easily implemented and performed by the entities obliged to do so. The survey conducted among young consumers primarily pointed to the shortcomings of knowledge on

waste segregation. Despite the fact that the vast majority declare that waste is collected selectively in their homes, they are unable to correctly indicate what type of waste should be thrown into the appropriate bins. Therefore, it is recommended that in each school, both primary and secondary, there are containers for selective waste collection, along with a description and instructions on what kind of waste should be placed in them. Undoubtedly, this will increase the ecological awareness of children and teach pro-ecological behaviour. Furthermore, direct participation of children in waste segregation campaigns is also necessary to consolidate this primarily practical skill. Interestingly, there is also no progression with age in the knowledge of the analysed groups of children. This is a dangerous phenomenon demonstrating that changing requirements are not communicated or properly recorded and skills in this area are not extended. This requires the right approach in the process of educating this generation.

It is worth emphasizing that the problem of sustainable consumption among children and adults in terms of waste management cannot be solved at the national level alone, due to, among others, has cultural differences, financial possibilities of individual countries, different approaches to the organization of the education system and environmental protection. This is extremely important now, when the issue of waste migration is becoming one of the most important problems in the implementation of sustainable development principles to global economic practice. Undoubtedly, this issue requires and will require in-depth research and international cooperation in this field in the future.

## Acknowledgments

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