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The current state of management, behaviour and education around organic waste in Europe.

Six case studies from Spain, Greece, Slovenia, Italy, Turkey and Romania

COM

Circular Organic Management

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Abstract

The report presents the findings of desk and field research carried out in Spain, Greece, Slovenia, Italy, Turkey and Romania within the bounds of the KA2 Erasmus+ project 'Circular Organic Management'. The report aims to give an overview of the state of organic waste management practices, relevant citizen behaviour and environmental education across the partner countries. The research reveals that there is a link between environmental education and ecologically sound(er) behaviour, as well as more proper waste management systems. Citizens and educators alike are showing willingness to incorporate the circular economy in their daily lives and their classrooms, and residents report a motivation to engage in the proper management of organic waste. The analysis suggests that those who do receive environmental education at school, in any shape or form, exhibit higher levels of care and awareness towards environmental and waste management issues than those who do not receive any such education. Recommendations on education and policy updates are drawn, reflecting the pressing need that was highlighted in the research for more awareness raising among citizens of all ages, and for state authorities to update their waste management systems with regulatory and policy support from national governments.

This report has been compiled by InCommOn - Innovative Communities Onwards, in its capacity as the Work Package Leader for Research and Materials' Development of the 'Circular Organic Management' project, based on research carried out by each project partner.

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1.Introduction

The aim of this report is to present and analyse the findings of 4 sets of research across 6 countries of Europe (Greece, Spain, Italy, Slovenia, Romania and Turkey), aimed at creating a baseline of understanding about 4 key factors around organic waste education: (1) the state of organic waste management, (2) citizen behaviour towards waste management, (3) the state of environmental education, (4) the experience of environmental education by teachers.

The report is part of the 'Circular Organic Management' Project, funded by the Erasmus+programme that aims to support behavioural change in schools around food and organic waste.

The project aims to create materials to support teachers in providing fun, useful and practical activities on organic waste management, thus, the research is oriented towards finding out what the situation is in each country, in order to create and provide relevant materials and teacher training. The objective behind constructing this framework of knowledge through the 4 pieces of research is to, firstly, utilise it to write teacher training materials on organic waste issues, for use in secondary schools and train teachers and, secondly, deliver the results and recommendations for change to policy makers at national levels, in order to foster and advocate for improvement and change in organic waste management and environmental education.

The report consists of four sections; Section 1 includes an introduction to the research; Section 2 presents the findings on the current state of organic waste management and citizen behaviour around organic waste per country; Section 3 presents the findings on the current state of environmental education and on the interviews with teachers, per country; Section 4 compiles and analyses the findings of the previous sections, and; Section 5 presents recommendations and suggestions for how these results can be used to inform the creation of teacher training materials and methodologies, as well as policy recommendations for decision makers.

The project's basic assumption is that environmental education in schools is essential in order to foster the next generation of citizens to be actively engaged through daily, life-long sound ecological habits, which is vital to addressing the global climate crisis and local environmental issues. In order to foster the next generation of active citizens who will practise proper organic waste management for a lifetime, the environmental education children receive in schools must therefore be formative, consistent, practical, relevant and fun.

The 4 pieces of research were carried out by the following organisations (project partners in 'Circular Organic Management') in their respective countries:

- UNIVERSIDAD DEL PAÍS VASCO/ EUSKAL HERRIKO UNIBERTSITATEA - Spain
- Innovation Hive - Greece
- INCOMMON NON PROFIT CIVIL LAW COMPANY - Greece
- Mednarodni institut za implementacijo trajnostnega razvoja, Maribor - Slovenia
- Exeo Lab Srl - Italy
- Innomate Ldt. - Turkey
- ASOCIATIA GRUPUL DE ACTIUNE LOCALĂ NAPOCA POROLISSUM - Romania

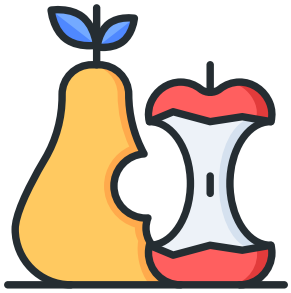
Our starting hypothesis is that a lack of environmental education in schools and lack of support for teachers engaging in it, leads to citizen behaviour that is not conducive to ecological preservation or proper organic waste management.

2.The state of organic waste management and citizen behaviour

In the EU, the total waste generated in 2020 by all economic activities and households amounted to 2,135 million tonnes or 4,815 kg per capita. Of this, 9.4% i.e. 196 million tonnes was produced by households. Municipal waste accounts for only about 10% of total waste generated. Although municipal waste generation totals vary considerably due to differences in consumption patterns and economic wealth, the EU average in 2021 was 530 kg per capita (EUROSTAT, 2021).

Waste management practices of municipal waste differ across the EU, and treatment strategies are identified based on reported amounts of municipal waste landfilled, incinerated, recycled and composted. According to the EUROSTAT waste statistics, about 34% of municipal waste is bio-waste, which means that somewhere in the region of 75 million tonnes of bio-waste from municipal waste is created every year across Europe (EU 27). Other sources place this estimate at up to 50% of municipal waste. Of this, it is estimated that around 45 million tonnes are composted. In per capita terms, of the 530 kg, 121 kg is landfilled (24%), 141 kg is incinerated (27%), 157 kg is recycled (31%) and 100kg is composted (17%). Of the 180 kg of organic waste within municipal waste (which is a rather low estimate based on the already low 34% estimate), 100 kg is composted. Of course this estimate is an average for the whole of the EU where there are differences in the methods and quantities of waste treatment practices. The rest of this section aims to provide a more accurate picture for the countries concerned within this project, in terms of the waste generated, the organic fraction and the treatment practices that take place in each of them.

According to Special Eurobarometer 501, although 78% of EU citizens agree that environmental issues have a direct effect on their daily life and their health and 66% report separating most of their waste for recycling, the countries involved in this research do not reflect these numbers. Nevertheless, from the findings it becomes clear that most citizens of the 6 countries are theoretically aware of and concerned about the issues involved with waste mismanagement and are willing to make a change, however, they do not seem to have enough information and/or guidance to implement this change.



2.1. Research Tools

The desk research was undertaken in order to acquire a general picture of the official structures, processes and plans in place in each country which manage organic waste. This quantitative data will be utilised as a baseline to analyse together with the public survey, the desk research on environmental education and the interviews with the educators, to identify if there are 'joined-up' policies, systems and services in place that support and reinforce behaviour change through environmental education (e.g. adequate local waste management, school transport for environmental activities, enforcement of environmental laws, visible and effective penalties for waste dumping etc). It was anticipated that there may be a gap between the provision of official structures for organic waste management, and citizen awareness / public education about them.

The purpose of the public survey was to find out whether citizens are aware of the official systems in place, whether they utilise them and trust them, whether they have been educated about them, and what behaviours they engage in with regard to organic waste management. Furthermore, the public survey was designed to find out about citizens' willingness to engage in correct organic waste management, if the facilities were available and if they were informed about how to utilise them. The existence of this desire will consolidate the objectives and purposes behind the COM project. We aimed to have 20 (80 in total) members of the public in each country -representing a cross-section of the population- fill out the survey, and 155 were completed in total.

The data acquired was both quantitative and qualitative, ensuring that for each question asked, a selection of 'other' was available along with a box for respondents to explain their answers, if they wished. Findings are collated per country, including cross-analysis and interpretation of the findings. For each of the six countries, the study will present the findings from the desk research carried out on the current state of organic waste management as well as the results of the surveys that were conducted on adult citizens of the participating countries.

2.2. Spain

Desk Research

According to the Urban Waste Collection Statistics of the National Institute of Statistics-INE, the total amount of domestic urban waste collected in Spain in the year 2020 was 16,452,778 tonnes (the total waste was 22,411,644 tonnes), of which 421,630 tonnes was from the Autonomous Community of the Basque Country (the total waste there was 805,486 tons). The generation of waste per capita in Spain was 475kg/In, and in the Autonomous Community of the Basque Country was 481kg/In (Ihobe, 2020). The organic component of this was a total of 1,253,212 tonnes in 2020, of which 37,720 tonnes was from the Autonomous Community of the Basque Country. The MSW collected in Spain was 5,084,072 tonnes in 2020, of which 351,734 tonnes was from the Autonomous Community of the Basque Country. The organic fraction of MSW was 1,253,212 tonnes, of which 37,720 tonnes was from the Autonomous Community of the Basque Country.

It is a big challenge in Spain, to achieve the EU recycling of organic waste targets. Municipalities have a recycling target of 55% of municipal waste by 2025. The majority of this waste (37%) is organic. For this reason, some municipalities have focused their efforts on the management of this type of waste. Many regional governments have strategies to achieve these targets. The cities in the Basque Country and Catalonia are examples that already have specific collection processes for organic waste in place. In the Basque Country, 43% of municipal waste is reused, recycled or composted. The separate collection of organic waste has increased in recent years, going from 6.4% in 2010 to 24% in 2018, but far from the objectives set for 2030 of reaching 100%. The municipalities with the highest separate collection of organic waste are located in Gipuzkoa and are close to 100 kg/ capita /year (Ihobe, 2020).

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The Spanish Law 7/2022 on Waste and Contaminated Soil for a Circular Economy establishes the objective of reducing waste by 15% by 2030 compared to that generated in 2010. In addition, it stated that a separate collection of organic waste must be launched before June 2022 for municipalities with more than 5,000 inhabitants and before December 2023 for the rest. Currently, in Spain only 25% of the municipalities have a comprehensive waste management plan and 5% a Municipal Circular Economy Plan. To meet the objectives of the Law, most municipalities consider that more human resources are required to manage it, as well as more material resources such as containers, vehicles, etc. A specific municipal waste tax that covers the real cost of its management has been proposed, since the municipalities that have already applied the Law do not manage to cover all costs. The Law also includes proposals such as creating new extended 'polluter pays' systems, that is, a mechanism financed by the waste producers themselves that is in charge of its collection and treatment (Galván López, V. 2021). In the Basque Country, a plan for the sustainable management of waste has been established (IHOBE, 2020) and a practical guide for community composting has been published (IHOBE, 2019).

Several organic waste management systems have been developed around the country. In Barcelona, the organic waste bins are freely accessible to all citizens and the collected waste is used for compost and biogas in the 'ecopark' area and another part is used to make community composting (which citizens use in their plants and orchards). In Bilbao, households can subscribe to the use of organic waste bins which they can access with an electronic card. In Biscay, more than 75% of municipalities separately collect household organic waste, which is later destined for composting.

In terms of organic waste management within the school environment, the 'Ingurugela' centre, the coordination centre for the Basque Government's environmental education programmes, supports schools to compost organic waste and use the compost for the school garden or the green areas of the centre. There are a few schools undertaking their own composting and using the compost for the school garden, mainly in more rural areas of the Basque Country. Good examples of such programmes are 'Kaixo Organikoa' that aims to recycle organic matter in the city and in the schools of the city of Bilbao and 'Eskolan Konposta' in the schools of the community of San Marcos, where the entire cycle of organic matter is developed in the school, also using the produced compost in the garden.

In terms of general behaviour towards environmental issues, a 2017 study on the 'Attitudes of Basque citizens towards the Environment' shows that 100% of the population considers that environmental protection is important. Specifically, 73% believe that it is very important and 27% quite important, while 82% of the population fully agree (37%) or quite agree (45%) with the idea that protecting the environment can boost economic growth in the Basque Country. In relation to changing attitudes and behaviour to protect the environment, 56% would be willing to make a change of habit (in any case) and 38% only if it did not involve a great effort.

Public Survey

The sample of the surveys consists of 21 people who reside in Spain, 8 of whom identify as male and the rest as female. Of the total number of respondents, 2 are between 18 and 25 years old, 9 are aged between 26 and 35, while 10 are between 36 and 50. Only 2 of the respondents do not hold a higher education degree/diploma or above. There is a wide range of professions and areas of work covered by the respondents, including education, engineering, psychology, journalism, conflict resolution, logistics, and social innovation. Respondents get their information from a mixture of media, with almost all of them using social media (76%) and 3 of them (14%) using only local media (radio, magazines, newspapers). There seems to be no correlation between gender, level of education or preferred source of information and the level of care or knowledge of the respondents on the themes covered by the survey.

In evaluating (from 1 to 5) their level of care regarding environmental issues, 1 respondent reports no care (level 1), 3 report that they do care to some extent (level 3), 14 care a lot (level 4), and 5 report a high level of care (level 5). In evaluating their level of care regarding the proper management of all streams of waste, 1 respondent reports little care (level 2), 3 respondents report that they do care to some extent (level 3), while 17 respondents report a high level of care (levels 4 and 5), with 12 and 5 respondents accordingly. See Diagram 1.

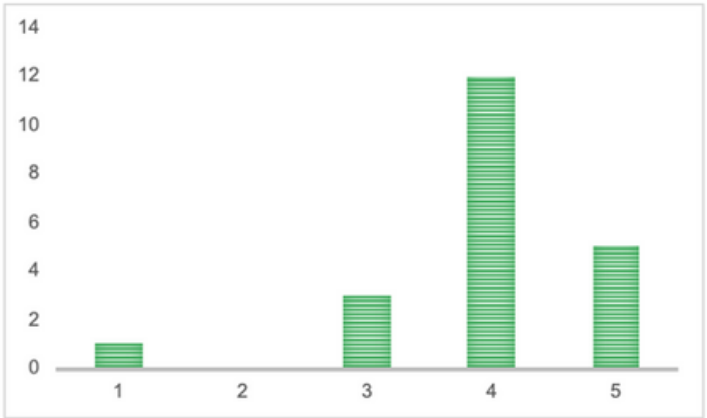


Diagram 1: Level of care regarding the proper management of all streams of waste | Spain

Notably, those aged between 18 and 36 years old report slightly higher levels of care towards environmental issues and proper waste management than those aged between 36 and 50 years old; the average level of care towards environmental issues is 4.1 for those aged between 18-36 and 3.6 for those between 36-50, and the average level of care for for proper waste management is 3.9 and 4.1 accordingly. However, age does not seem to make a difference when it comes to the level of knowledge and awareness.

In evaluating their level of knowledge regarding the potential for reuse/repurpose of organic waste, 5 respondents report that they have little knowledge (level 2), 10 respondents report that they have some knowledge (level 3), and 6 report a good level of knowledge (level 4), while none consider themselves as having either no (level 1) or very good knowledge (level 5) regarding the potential of organic waste reuse. As Diagram 2 below demonstrates, only 34% of the respondents feel that they have good knowledge about the local practice of organic waste management, while more than half report having only some knowledge. The responses demonstrate a gap between the levels of care and the levels of knowledge.

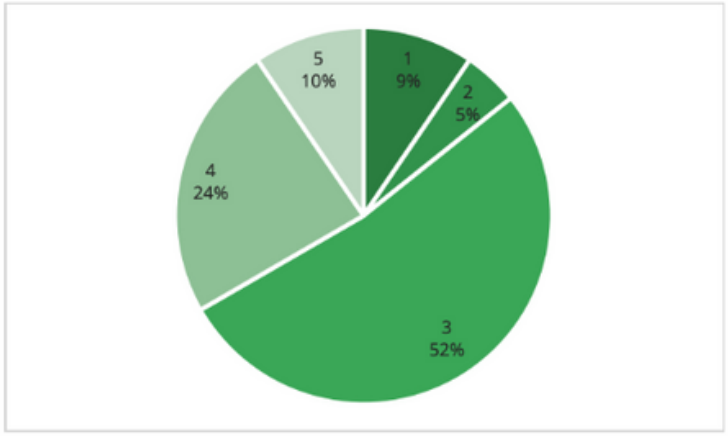


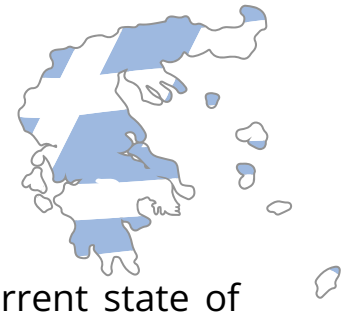
Diagram 2: Level of awareness regarding the management of organic waste that takes place in their town/city | Spain

Out of the 21 respondents, 20 reuse items regularly, while all 21 recycle regularly. In total, 11 respondents separate their organic household waste, while 11 do not for varying reasons. 18 would be interested in learning more about organic waste reduction, and 19 would be motivated to engage in organic waste reduction at home, if it were easy to do so, with the 2 respondents who report no such motivation claiming it's due to mistrust on the relevant authorities.

Only 5 respondents received information / classes / activities about organic waste handling at school. 3 of the respondents have children and 2 of them report that their children get information / classes / activities about organic waste handling at school as part of another subject. Finally, when asked whether there is a body / organisation / authority they can reach out to in their town to get more information on organic waste handling, 13 respond that there is, with most of them pointing at the municipal authorities.

The findings demonstrate that although the concern for the environment and the proper management of waste is rather high -with 90% and 81% of respondents accordingly reporting high levels of care-, the level of knowledge about the potential for reuse of organic waste is rather low, with only 29% feeling that they have good knowledge, while 34% are aware of local organic waste management practices. This points to the fact that although there is concern and desire to partake in ecologically sound behaviour, there is not enough relevant information. Finally, although all respondents reuse and recycle at home, half of them do not separate their organic waste. The vast majority claim that this behaviour is due to the lack of viable options as the city in which they live does not have an outlet for organic waste. Despite this, most would like to know more about it and almost all would be motivated to participate in reducing organic waste at home. Therefore, there seems to be a need for more awareness and education on the issue of organic waste management.

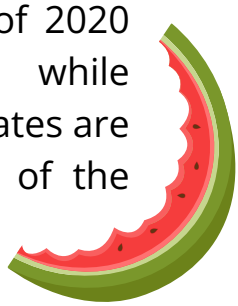
2.3 Greece



Desk Research

The results of the desk research clearly show that the current state of organic waste management in Greece is below par. Waste generation for the year 2020 amounted to 28,943,897 tonnes, with municipal solid waste accounting for 20.9% of this, including households which account for 15.6%. Municipal waste amounted to 6,056,479 tonnes in 2020 (ELSTAT, 2022), with organic waste being estimated at 2.07 million tonnes (Eurostat, 2019). As this represents only 34% of MSW it seems a rather low estimate.

The separate collection system consists of mixed solid waste, recycling and in some municipalities there are a few bio-waste bins. “According to Eurostat, the annual generated waste amounts to 514kg per capita which compared with the EU average (482kg/capita) is much higher despite the financial recession the country has gone through recently (Eurostat, 2017). Moreover, based on NWMP’s data, 44.3% of the produced municipal waste consists of bio-waste, 22.2% of paper and cardboard, 13.9% of plastics, 3.9% of metals, 4.3% of glass and 11.4% of the other recoverable materials, and non-recoverable materials. (NWMP, 2020).” Of the total amount of recyclable waste, only 21% is recycled as of 2020 (https://www.eea.europa.eu/ims/waste-recycling-in-europe), while merely 2% of organic waste is utilised into composting. The estimates are inconsistent between sources, demonstrating a fragmentation of the available data.



Concerning national guidelines on organic waste, the recent National Law 4819/2021 incorporates the provisions of the EU Waste Framework Directive 2008/98/EC, including the promotion of prevention, separate collection and composting of bio-waste. Specifically, the new law creates an obligation to municipalities to ensure the separate collection of organic waste, beginning 1 January 2023. The National Circular Economy Plan also gives directions for the separate collection of organic waste, as well as for the prevention of food waste.

However, organic waste management is still in its infancy in Greece, with only some bright exceptions engaging in the separate collection of organic waste. Some municipalities have put in place a network of 'brown bins' (organic waste receptacles), while regional authorities are currently providing municipal authorities with the necessary equipment (kitchen bins, collection bins, appropriate vehicles), a process which is meant to be completed before the end of 2023. However, the decentralised authorities are not informing citizens and businesses regarding organic waste separation and collection, which means that there is a rather low uptake of the new habit of at-source-separation. Furthermore, some waste treatment facilities include organic waste treatment plants. For instance, in Attica, the main waste treatment plant (landfill) has an industrial composting facility where the organic waste collected in Attica ends up. Other regional facilities also provide organic waste treatment, while there are many bio-waste treatment plants in the process of tender (by the state) or in construction. These are mainly private waste management companies.

Generally, there is no organised, centralised effort for the application of organic waste management systems in educational settings. However, there are some schools that have in-school composting, for instance, that we know of, while there are also some schools in Athens that we have visited - as InCommOn - to implement a circular economy education programme that concluded with the installation of a compost bin at the school's premises.

In all, there is a lack of proper information -if any- being given to citizens for their engagement in the organic waste management system. Moreover, there is the very bad precedent of the recycling system, which in Greece is rather problematic, riddled with scandals and mismanagement which has resulted in a lack of trust in the systems by the citizens, that expands to all attempts for waste management. This has led to a situation in which, even when citizens know about proper waste management, they don't necessarily engage in it, as they don't trust that the municipality / waste companies will handle it properly. There is no culture of recycling in Greece, mainly because there is no appropriate education - at any level, neither at schools, nor at adult level.

Public Survey

The sample of the surveys consists of 43 people who reside in Greece, 7 of whom identify as male and the rest as female or non-binary. Of the total number of respondents, 17 are aged between 26 and 35, while 25 are above 51 years old. Only 2 of the respondents do not hold a higher education degree/diploma or above. There is a wide range of professions and areas of work covered by the respondents, including education, science/research, forestry, shipping, media, art, IT, psychology, architecture, translation, pharmacist, civil servant, social work, private employees, managers. We are therefore assured that despite the imbalance of gender in the responses, we have a sufficiently broad cross section of the population. Respondents get their information from a mixture of media, including national and international newspapers, traditional media and social media. There seems to be no correlation between gender, level of education or preferred source of information and the level of care or knowledge of the respondents on the themes covered by the survey.

In evaluating (from 1 to 5) their level of care regarding environmental issues (incl. climate crisis, waste management, ecosystems' disruption, etc), none of the respondents report no or little care (levels 1 and 2), 10 of them report that they do care to some extent (level 3), 15 care a lot (level 4), and 18 report a high level of care (level 5). In evaluating their level of care regarding the proper management of all streams of waste, 3 respondents report that they care little (level 2), 8 respondents report that they do care to some extent (level 3), while 32 respondents report a high level of care (levels 4 and 5). See Diagram 3.

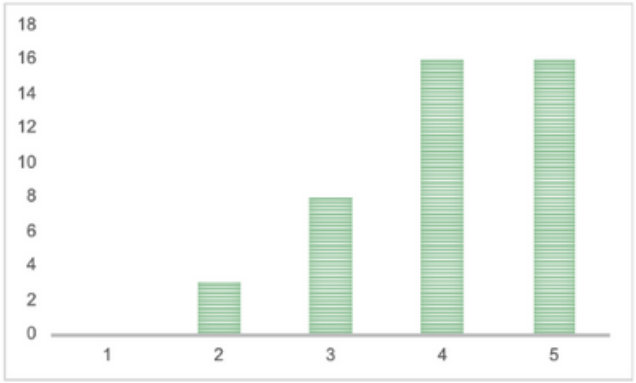


Diagram 3: Level of care regarding the proper management of all streams of waste | Greece

In evaluating their level of knowledge regarding the potential for reuse/repurposing of organic waste, 3 respondents report that they have no knowledge at all (level 1), 9 report that they have little knowledge (level 2), 16 respondents report that they have some knowledge (level 3), 10 report good level of knowledge (level 4) and only 5 consider themselves as having very good knowledge (level 5) regarding the potential of organic waste reuse. When it comes to their level of awareness regarding the management of organic waste that takes place in their town/city, only 24% of the respondents feel that they have knowledge about the local practice of organic waste management, while as high as 44% have little to no knowledge at all (Diagram 4).

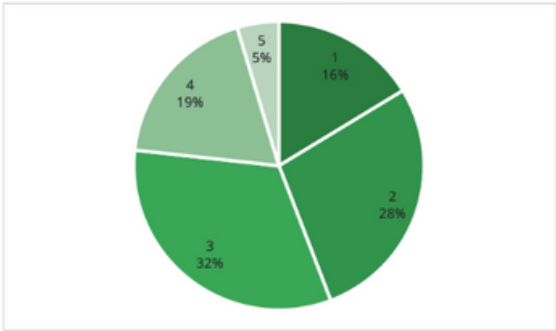


Diagram 4: Level of awareness regarding the management of organic waste that takes place in their town/city | Greece

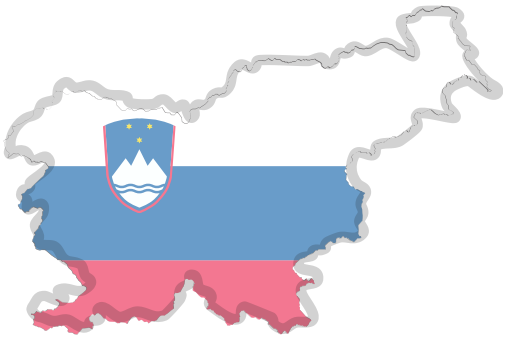
Out of 43 respondents, 42 reuse items regularly (e.g. jars and plastic boxes from food products, plastic bags etc), while 36 recycle regularly ('regularly' meaning not every item, but as a general habit, to have two separate disposal units at home and throw rubbish in one, and items for recycling in the other). Of the 7 who do not recycle regularly, 3 report that this is because they do not trust that the relevant authorities actually recycle the separated waste, echoing the findings from the desk research. In total, 13 respondents separate organic household waste (for compost or for organic waste collection), while of the 28 who do not, 18 report it's because there is no municipal organic waste collection in their town. 42 (that is, the vast majority) would be interested in learning more about organic waste reduction, and 41 would be motivated to engage in organic waste reduction at home, if it were easy to do so, again the vast majority of the respondents.

Only 10 respondents received information / classes / activities about organic waste handling at school. 13 of the respondents have children and only 5 of them report that their children get any information / classes / activities about organic waste handling at school, either as part of a dedicated environmental subject, as part of another subject (such as biology, chemistry, etc) or through an extracurricular activity. Finally, when asked whether there is a body / organisation / authority they can reach out to in their town to get more information on organic waste handling, 25 respond that there isn't. These figures demonstrate that even among citizens who are interested in learning about proper waste management (as evidenced in diagram 1), there are few opportunities for them to find information or engage in it effectively. By extrapolation, we can assume that there are therefore extremely low levels of awareness by people who are not already interested in proper waste management and a large populace which is simply not reached at all with regard to waste issues.

In all, while as high as 95% of the respondents would be happy to separate their organic waste at home, only 24% are aware of any separate collection or management of this waste happening in their towns and 58% of them feel that they have nowhere to reach out to for relevant information. The findings clearly point to a need for more awareness raising and more education on the issue of organic waste management, while the desire and motivation of citizens seem to be in place. Moreover, a correlation could be drawn between little to no relevant education received at school and the low level of awareness on the issue, however this does not necessarily point to causation.

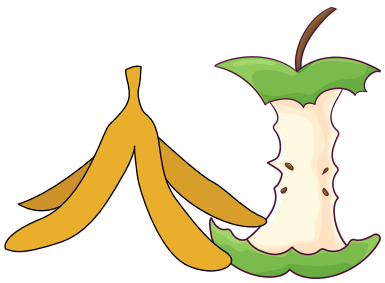
2.4 Slovenia

Desk Research



In 2020, 7.7 million tonnes of waste was generated in Slovenia, which is almost 9% less than a year earlier. In 2021, 143,254 tonnes of organic waste was generated. In 2021, almost 1.1 million tonnes of municipal solid waste was generated in Slovenia, which amounts to 518 kg/capita, 34% of which is estimated to be organic.

In Slovenia, waste management is mainly the responsibility of local municipalities. The waste management system is based on the EU waste hierarchy, which prioritises waste reduction and prevention, followed by reuse, recycling, and energy recovery, and finally, disposal as a last resort. Household waste is collected separately and sorted into different categories, primarily paper, glass, plastic, mixed, biowaste and bulky waste. Waste is collected on different levels: (i) at home (where each house has its own bins and apartment complexes have collection points), (ii) at collection/eco-islands available in each municipality (which serve as collection points for bigger amounts of waste paper, cardboard and glass, with some also having containers for electronic waste and electrical equipment, (iii) at collection centres, where all types of waste are collected (including building materials, bulky waste, toxic waste, green garden waste, metals, wood, etc.), (iv) through organised clean-up actions. Recycling centres are also available in all major cities, and residents can bring their sorted waste to these centres for recycling.



The recycling rate of waste (excluding mineral waste) in 2022 was almost 86%, while the recycling rate of municipal waste was 60%. The landfill rate of all waste treated (excluding major mineral wastes) was 5.2 %. The capital city, Ljubljana, is very environmentally oriented and focuses on sustainable development. With different awareness-raising activities, they encourage users to be responsible in their daily life and to aim for the development of high-quality, environmentally friendly and sustainably-oriented services. Ljubljana is the first and only zero-waste capital in Europe. Four types of waste are collected in Ljubljana through the door-to-door system, while there is also an underground waste collection system. The underground bins for organic waste and other waste are intended for households and shops, catering facilities and companies and users access them with special cards that records the entry and determines the monthly charge.

With regards to legislation, at national level the key legislation governing waste management is the 'Decree on Waste' (Uredba o odpadkih). It defines the legal framework for waste management, including waste prevention, minimization, separation, collection, transport, treatment, and disposal. Its basis lies in the Environmental Protection Act and Services of General Economic Interest Act. In addition to the Waste Act, several other national guidelines and regulations related to waste management in Slovenia include the Decree on Packaging and Packaging Waste and the Decree on biodegradable kitchen waste and garden waste management.

At the regional and municipal levels, waste management guidelines and regulations vary depending on local needs, priorities, and infrastructure. Since 1 July 2011, separate collection and collection of organic waste has been mandatory throughout Slovenia. Household waste must either be composted at home, or delivered to the public waste service, for a fee. In 2022, the recovery rate of organic waste was estimated at 66%.

The 2021 Eurobarometer survey (No.513) shows that 11% of respondents in Slovenia consider climate change to be the most pressing problem in the world in general. When asked how serious a problem they consider climate change to be, 77% of Slovenians answered "a very serious problem". A 2019 Eurobarometer survey (No.501) on general attitudes towards the environment shows that for 65% of Slovenians protecting the environment is very important and for 30% fairly important, while 63% of respondents feel that the biggest environmental issue is the growing amount of waste.

In interpreting the above results for Slovenia, social, cultural and economic factors need to be taken into consideration. The cultural emphasis on thriftiness and resourcefulness has led to a long tradition of reusing and recycling materials. However, this cultural norm is not always extended to organic waste, which is often seen as dirty or unpleasant to handle. Lack of awareness and education about the importance of sustainable waste management practices can also contribute to a lack of interest in organic waste management. Many citizens (especially older) may not be aware of the environmental impacts of organic waste or the benefits of composting and other organic waste management practices. The cost of implementing and maintaining organic waste management systems can be a barrier for both households and municipalities. Municipalities may lack the necessary funds to establish and maintain composting facilities or implement door-to-door collection of organic waste. For households, the cost of purchasing composting equipment or paying for organic waste collection services may be prohibitive.

Public Survey

The survey's sample consists of 20 respondents who reside in Slovenia, 9 female and 11 male. Of the total number of respondents, 11 respondents are aged between 18 and 25, 3 are between 26 and 35 years old, 1 is aged between 36 and 50 and 5 are 51-65. 13 respondents hold a higher education/professional diploma or university degree and 7 a high school diploma. There is a wide range of professions covered by the respondents, including IT, journalism, caregiving, educators, students, project managers, accountrants, auditors and interpreters. The most used news sources for respondents are social media, with 75% of respondents using them, followed by national television and radio broadcasts (60%) and local media (radio, magazines, newspapers). National and international newspapers (print or online) (35 %) and specialised (politically targeted) media (10%) were the least used sources. There seems to be no clear correlation between gender, age, level of education or preferred source of information and the level of care or knowledge of the respondents on the themes covered by the survey.

In evaluating (from 1 to 5) their level of care regarding environmental issues, 1 of the respondents reports little care (level 2), 7 report they care to some extent (level 3), 8 care a lot (level 4), and 4 report a high level of care (level 5). In evaluating their level of care regarding the proper management of all streams of waste, 2 respondents report little care (level 2), 5 respondents report that they do care to some extent (level 3), while 13 respondents report a high level of care (levels 4 and 5), with 8 and 5 respondents accordingly. See Diagram 5.

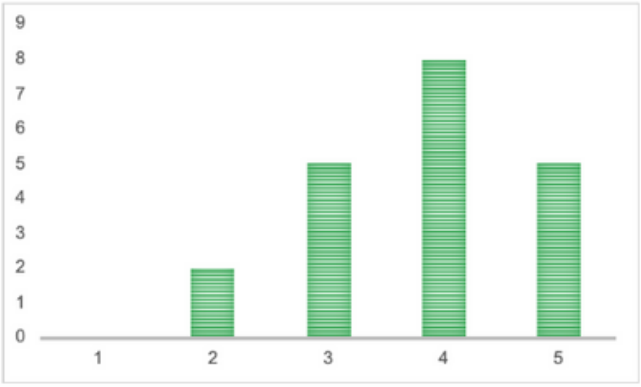


Diagram 5: Level of care regarding the proper management of all streams of waste | Slovenia

In evaluating their level of knowledge regarding the potential for reuse/repurpose of organic waste, 55% report a high level of knowledge (levels 4 and 5) while 45% have medium to low level of knowledge (levels 3 and 2). Specifically, 3 respondents report little knowledge (level 2), 6 respondents report that they have some knowledge (level 3), 8 report a good level of knowledge (level 4), while 3 consider themself as quite knowledgeable (level 5) regarding the potential of organic waste reuse. When it comes to their level of awareness regarding the management of organic waste that takes place in their town/city, as high as 55% of the respondents feel that they have good knowledge, while 25% report little to no knowledge at all, and a 20% an intermediate level of awareness (Diagram 6). The chart below represents the levels of awareness regarding the management of organic waste, which in contrast to many of the other countries in the research, demonstrates a better correlation between levels of care about waste (Diagram 5) and knowledge of how to engage in correct organic waste management.

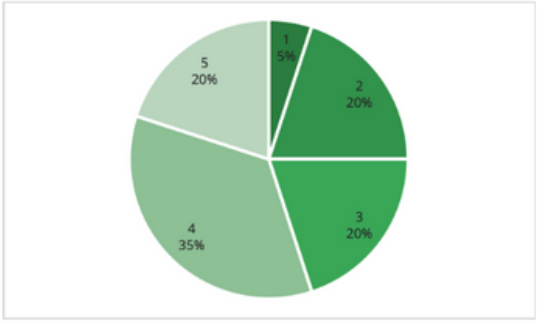
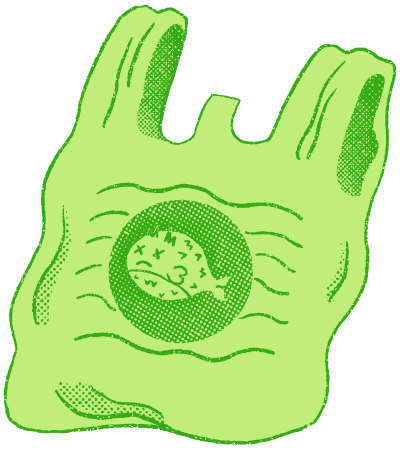
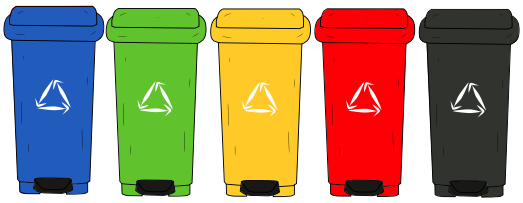


Diagram 6: Level of awareness regarding the management of organic waste that takes place in their town/city | Slovenia

Out of the 20 respondents, 16 reuse items regularly (80%), while 18 of them report that they recycle regularly (90%). 15 respondents (75%) separate their organic household waste, while only 9 would be interested in learning more about organic waste reduction. From those who report no such interest, 2 believe they already know a lot and the rest report a mixture of reasons with the most prevalent being having no such interest, having no time to devote to this or believing it's not important. However, 17 would be motivated to engage in organic waste reduction at home. For the 15% who would not be motivated, reasons include the lack of interest/impact and distrust in authorities to handle waste properly.

8 respondents received information / classes / activities about organic waste handling at school, 5 of them as part of another subject. Of the 7 respondents who have children, 6 of them report that their children get information / classes / activities about organic waste handling at school either as part of another subject or as an extracurricular non-obligatory activity. Finally, when asked whether there is a body / organisation / authority they can reach out to in their town to get more information on organic waste handling, 13 respond that there is, such as local waste management/collection company, municipality, NGOs. Since there is almost always a body to reach out for information, the ones who answered no are seemingly not as informed about the local state of waste management.





Slovenia reports high levels of both care and knowledge regarding environmental issues, the proper management of waste, as well as organic waste separation. There seems to be no correlation between relevant education received at school and these reported levels. However, the most interesting finding is that among the 7 respondents who reported a lower level of care regarding the proper management of waste (levels 2 and 3), predominantly young people (6 aged 18-25 and 1 26-35) were present.

The same is true when it comes to awareness regarding the management of organic waste that takes place in their town/city; from the 9 respondents who report low to medium awareness (levels 1-3), 7 are aged between 18 and 25 and 2 are between 26 and 35.

A possible explanation could be that younger people live in households where they are not the primary member dealing with waste management, e.g. if they live with their parents. However, the sample is too small to suggest causation. Moreover, Slovenia was the only country where respondents were uninterested in learning more about organic waste management because they feel they already know enough.

However, it also reports the highest percentage of uninterestedness, with more than half of the respondents (55%).

In all, a higher degree than that of the average EU percentages of recycling and reusing by citizens is not surprising, as Slovenia has well-established and strict waste management guidelines, using monetary penalties for non-compliance. Municipal waste management is divided almost everywhere into at least 4 streams: plastics, paper, mixed and biowaste, with only some smaller/remote/rural municipalities not providing organic waste collection who instead practise home composting.

2.5 Italy

Desk Research

The waste management sector has been growing strongly in recent years in Italy, and this is evidenced by the increase in turnover in this field. Municipal waste, which accounts for the majority of waste, was about 30 million tonnes in 2019. This equates to approximately 500 kg per capita annually. Over the coming years, a growth in waste production is estimated, given the increase in consumption, however, an increase in separate waste collection and recycling is also expected. In 2021, national municipal waste production was 29.6 million tonnes. The organic fraction of MSW amounts to about 35% of total municipal waste production, about 11 million tonnes. The Italian recycling industry is growing steadily, even after the pandemic, while data show growing trends for separate collections of organic waste. Landfilling accounts for 21% of municipal waste, or nearly 6.3 million tonnes.

The separate collection of organic waste has been growing steadily for more than 20 years: it has always been the main portion of MSW and year on year has increased its weight in relation to total waste, from 36.6% in 2010 to 42.7% in 2014. According to ISPRA's Waste Report 2019 Edition, monitoring organic waste collection in Italy showed that 7.1 million tonnes of organic waste (wet, green and other organic matrices and from separate collection) are collected, including 5.1 million tonnes of FORSU (Organic Fraction of Municipal Solid Waste) and almost 2 million tonnes of green waste (grass clippings, prunings etc.)

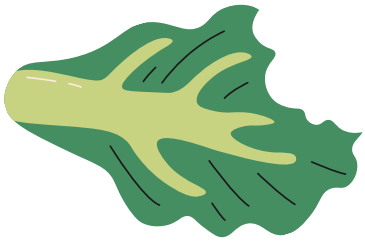
As such, organic waste collection has increased by 7.5% compared to the previous year (+500,000 kg) and confirms that it is the most important part or separated waste collection. Italian citizens separate about 17.5 million tonnes, 40.4% of which is organic waste (FORSU and green). Between 2016 and 2017, the latest available data confirm the growth trend of RD (Separate Collection) of organic waste with record-breaking data attributable mainly to the wet waste, which from 2017 to 2018 increased from 4.5 to 5.1 million tonnes. At the national level, the per capita figure for organic waste shows a major surge from 108 to 117 kg/capita/year. Growth estimates lead us to assume that by 2025, 9,200,000 tonnes of organic waste will be collected, or more than 150 kg/capita/year.

In the ranking compiled by 'Altroconsumo' against the analysis of behaviour in different nations, it emerges that Italy has an average propensity for sustainability. In fact, it ranks 6th, right after Germany and Spain, with a score of 53/100 for green lifestyle. The protection of the environment is very important to as many as 7/10 Italians. Specifically, there is a greater focus on the relationship with food and shopping. Results are average but generally positive with regard to waste management, with 80% of consumers saying they sort waste correctly, and water and energy, with 64% saying they adopt energy-saving behaviours at home. Eco-sustainability is among the criteria for choosing products and services: 35% buy those with 'green' labels, 33% from environmentally conscious companies, and 30% invest following this criterion.

Public Survey

The survey's sample consists of 25 people who reside in Italy, with 11 of them identifying as male and 14 as female. Of the total number of respondents, 6 are between 18 and 25 years old, 9 are between 26 and 35, 7 are between 36 and 50 and 3 are between 51 and 65. Only 4 of the respondents do not hold a higher education degree or diploma, 2 of whom are currently University students. There is a wide range of professions covered by the respondents, including students, customer care supervisor, sales agent, engineers, entrepreneurs, project managers, insurer, IT analyst, dentist, hairdresser, personal trainer and nurse. Respondents get their information from a mixture of media. There seems to be no correlation between gender, age, level of education or preferred source of information and the level of care or knowledge of the respondents on the themes covered by the survey.

In Italy, we have been talking about separate waste collection for about 50 years, but, as of today, the percentage of separated waste to the total is still around 53.3%. Statistics report that there is still little awareness of the importance of 'environmentally sustainable' behaviours and practices. ISPRA's 'Urban Waste Report 2020 Edition' notes that separate waste collection has increased from about 9.9 million tonnes in 2008 to 18.5 million tonnes in 2019, but this is still far from EU targets. Total recycling of waste generated and collected separately stands at 53.3%. Three provincial capitals, Treviso, Pordenone and Belluno, are among the 'waste free' administrations, where each citizen produces a maximum of 75 kg of dry waste per year, and can be considered examples of good practice.



As for the specific management of organic waste, it should be premised that the EU and Italian regulations were based on three tools/objectives: separate collection, composting, and digestion of organic waste, as evidenced by The DL.vo 116/2020. DL.vo 116/2020, i.e. the waste (and packaging) management reform transposing Directive 2018/851. The legislation also promotes on-site composting activities including self-composting and community composting.

According to the latest Ispra report, there is a slight but steady deterioration in the quality of organic waste collection, due to incorrect deliveries by citizens. In order to address this, the Legislative Decree 152/2006, which transposes the Waste Framework Directive in Italy, stipulates that from January 2022, it will be mandatory in all Italian municipalities to provide for the separate collection of the wet fraction of organic waste. With regard to public education and information, the Municipality of Trento, as part of the European Life project 'No Waste', has recently implemented the educational project 'Less Waste' in the primary and secondary schools in the municipal area. The project explores the themes of waste reduction and conscious spending.

In evaluating (from 1 to 5) their level of care regarding environmental issues, 2 of the respondents report little care (level 2), 9 report they care to some extent (level 3), 11 care a lot (level 4), and 3 report a high level of care (level 5). In evaluating their level of care regarding the proper management of all streams of waste, 3 respondents report little care (level 2), 11 respondents report that they do care to some extent (level 3), while 11 respondents report a high level of care (levels 4 and 5), with 9 and 2 respondents accordingly. See Diagram 7.

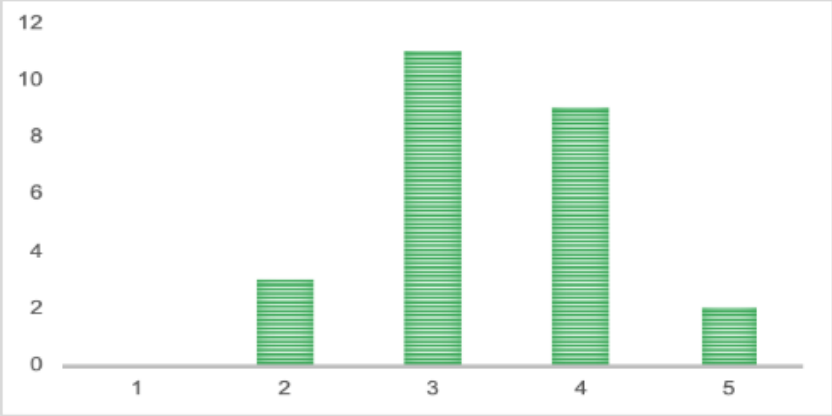
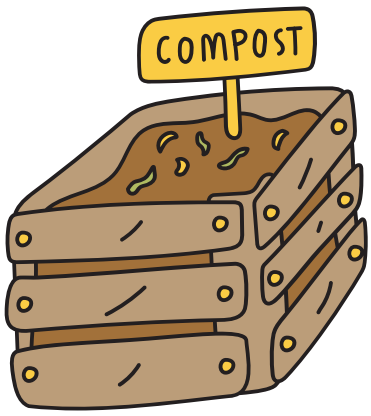


Diagram 7: Level of care regarding the proper management of all streams of waste | Italy

In evaluating their level of knowledge regarding the potential for reuse/repurpose of organic waste, 1 respondent reports no knowledge (level 1), 6 report little knowledge (level 2), 8 respondents report that they have some knowledge (level 3), 9 report a good level of knowledge (level 4), while only 1 considers themself as quite knowledgeable (level 5) regarding the potential of organic waste reuse. As Diagram 8 below demonstrates, 24% of the respondents feel that they have good knowledge about the local practice of organic waste management, while as high as 36% report little to no knowledge at all.



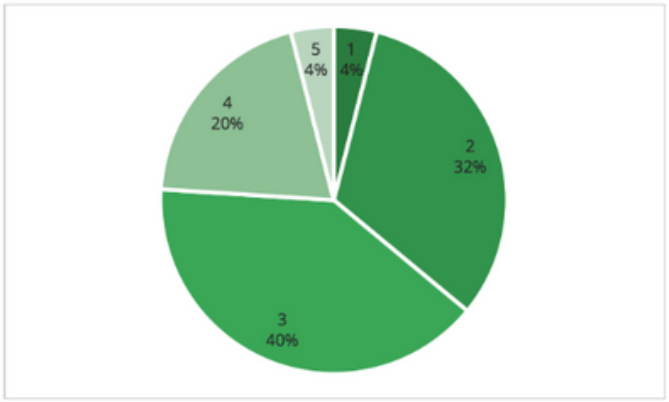


Diagram 8: Level of awareness regarding the management of organic waste that takes place in their town/city | Italy

Out of the 25 respondents, only 14 reuse items regularly, while all of them report that they recycle regularly. Almost all respondents (24) separate their organic household waste. 22 would be interested in learning more about organic waste reduction, and 24 would be motivated to engage in organic waste reduction at home.

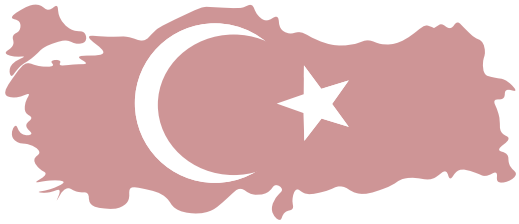
9 respondents received information / classes / activities about organic waste handling at school, 6 of them as an extracurricular activity. 10 of the respondents have children and 7 of them report that their children get information / classes / activities about organic waste handling at school either as part of another subject or as an extracurricular non-obligatory activity. Finally, when asked whether there is a body / organisation / authority they can reach out to in their town to get more information on organic waste handling, 10 respond that there is not.

From the countries covered by this research, Italy has the highest rate of organic waste separation, with 96% engaging in separation at source. Interestingly though, it has a much lower rate of reuse as compared to the other countries. In fact, separate waste collection is active throughout Italy and citizens are therefore required to separate waste at home between organic waste, plastic, paper and mixed waste.

These findings point to the fact that there is no consistent ecologically sound behaviour, and that it might be duty and obligation that inform behaviour instead of knowledge and genuine care. Therefore, there seems to be a need for more awareness regarding a comprehensive environmentally sound behaviour as well as the importance of the values behind the circular economy, which encompass our relationship with the environment and nature in a more holistic way than merely recycling.

2.6 Turkey

Desk Research



Turkey generates 32.3 million tonnes of municipal solid waste per year; the annual amount of waste generated per capita amounts to around 412 kg (TUIK 2020, Official statistic). According to Waste Atlas, Turkey's waste collection coverage rate is 77%, whereas its unsound waste disposal rate is 69%. According to the National Waste Management Plan and the 2016 Action Plan, 61.07% of municipal waste is disposed of in sanitary landfills and 28.25% in municipal landfills. 11% of municipal waste (including packaging waste) was reported as recycled, composted or otherwise disposed of.

The Turkish Ministry of Environment and Forestry declared in 2006 that their priority disposal method is composting to reduce organic waste landfilling. This statement is in harmony with European Union Adaptation Acquisitions since EU Member Countries aim to reduce the landfilling of biodegradable waste. But, most of the current composting plants in Turkey are not designed to process 'Turkish Type' solid waste which has high levels of humidity, high amounts of ash, and low levels of carbonaceous material. The system's operation is costly because of their high electricity consumption. Additionally, mixed waste collection systems in Turkish Municipalities need to switch from current systems, to source-separated collection systems to reduce the charges of composting plants and future incineration plants.

Approximately 130 million tonnes of waste is produced in Turkey every year and only 7% of this is recycled. Other data show that from the 127.4 million tonnes of waste processed in waste disposal and recovery facilities, 78.3 million tonnes were disposed of while 49.1 million tonnes were recovered. Energy recovery was achieved by burning 1.3 million tonnes of waste in co-incineration facilities with waste recovery licences. Except for compost and co-incineration facilities, a total of 47.6 million tonnes of metal, plastic, paper, mineral, etc. is produced in other licensed waste recovery facilities. This collectively results in approximately 61% of the 127.4 tonnes of waste processed being disposed of while 39% was recovered. An annual amount of 14.1 million tonnes of organic waste and 17.2 million tonnes of other urban waste has been recorded. Organic wastes constitute approximately 33% of 32.3 million tonnes of waste (H.Durmaz, BEU Journal of Science 9 (3), 1415-1424, 2020 9 (3), 1415-1424, 2020).

Turkish legislation and policy in the field of waste management have been prepared in line with the country's harmonisation process with the European Union. In this context, on the basis of Environmental Law No. 2872, several regulations have been adopted to regulate different categories of waste. The Waste Management Regulation, which sets out the framework for waste management in Turkey, has been implemented, taking into account the Waste Framework Directive. Waste management has been identified as a top priority by the Ministry of Environment and Urbanization. In this context, the Ministry published the 'National Action Plan for Waste Management 2023' in 2016, which analyses the current waste management situation for the 81 provinces of Turkey and sets out the country's waste management objectives.

Public Survey

The sample of the surveys consists of 23 people who reside in Turkey, 10 of which identify as male and 13 as female. Of the total number of respondents, 2 are aged between 18 and 25 years old, 5 are aged between 26-35 and 16 are 36-50 years old. Only 2 of the respondents do not hold a higher education degree/diploma or above, and those are aged between 18-25. The range of professions and areas of work covered by the respondents is narrow, mainly consisting of education (both educators and students), medicine and IT.

There seems to be no correlation between gender or level of education and the level of care or knowledge of the respondents on the themes covered by the survey.

Respondents get their information from a mixture of media, including national and international newspapers, national traditional media, local media and social media; 22 respondents get their information from social media either exclusively or in combination with other forms of media, while 1 respondent receives information from local media (radio, magazines, newspapers) exclusively.

In evaluating (from 1 to 5) their level of care regarding environmental issues (incl. climate crisis, waste management, ecosystems' disruption, etc), none of the respondents report that they do not care at all (level 1), 4 care a little (level 2), 7 of them report that they do care to some extent (level 3), 6 care a lot (level 4), and 6 report a high level of care (level 5). Of the 12 respondents who report a good level of care (levels 4 and 5), 11 get their information exclusively from social media while 1 respondent from both social media and newspapers. Of the 11 respondents who report a level 2 or 3 care, only 1 of them uses social media exclusively as a source of information, while the rest use a mixture of media, including social media, national and international newspapers, national traditional media and local media.

In evaluating their level of care regarding the proper management of all streams of waste, 3 respondents report that they care little (level 2), 8 respondents report that they do care to some extent (level 3), while 12 respondents report a high level of care (levels 4 and 5). See Diagram 9.

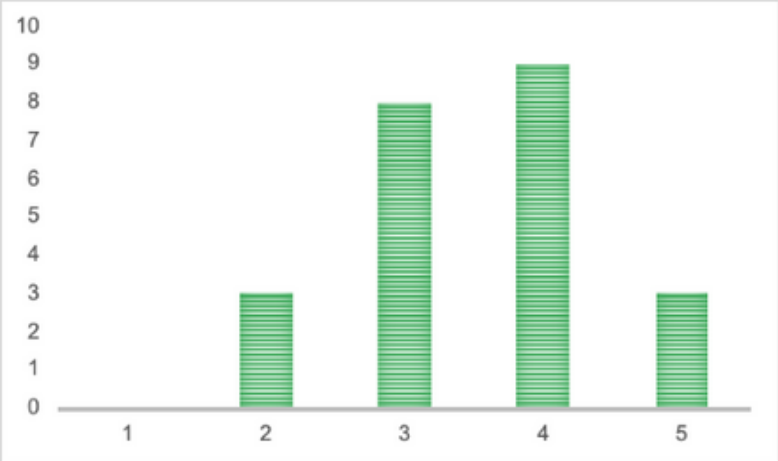


Diagram 9: Level of care regarding the proper management of all streams of waste | Turkey

As with the previous question, the 12 respondents who report a higher level of care (levels 4 and 5), get their information exclusively from social media, with only 1 of them combining it with national and international newspapers.

In evaluating their level of knowledge regarding the potential for reuse/repurpose of organic waste, 8 respondents report that they have little knowledge (level 2), 4 respondents report that they have some knowledge (level 3), 5 report good level of knowledge (level 4) and 6 consider themselves as having very good knowledge (level 5) regarding the potential of organic waste reuse. Again, of the 11 respondents who report good awareness (levels 4 and 5), 10 are informed exclusively from social media. When it comes to their level of awareness regarding the management of organic waste that takes place in their town/city, 2 respondents report no such awareness (level 1), 5 report little awareness (level 2), 5 have some awareness (level 3), 10 report good awareness (level 4) and only 1 consider themselves as being completely aware (level 5) regarding the organic waste management that takes place in the area they live in. The correlation with their preferred source of information is the same as with the previous questions; 10 out of 11 respondents with good awareness (levels 4 and 5) receive their information exclusively from social media. As Diagram 10 below demonstrates, 47% of the respondents feel that they have good knowledge about the local practice of organic waste management, while 31% have little to no knowledge at all. This 47% (11 out of 23 respondents) is the part of the sample that uses social media as their primary news' source.

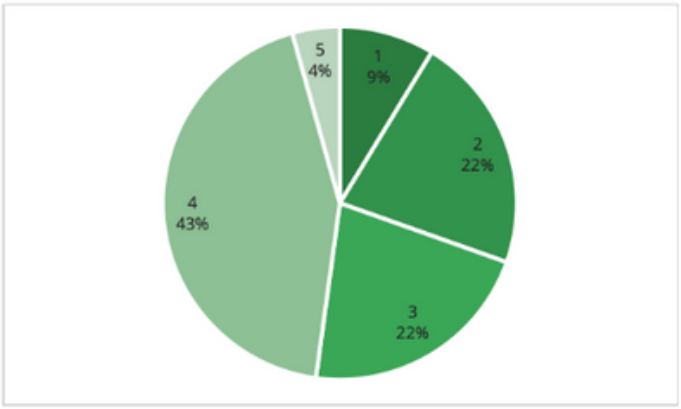
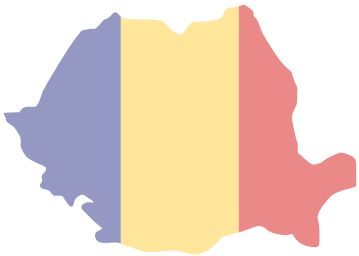


Diagram 10: Level of awareness regarding the management of organic waste that takes place in their town/city | Turkey

Out of 23 respondents, 18 reuse items regularly (78%), while 13 recycle regularly (57%). Of the 10 who do not recycle regularly, 9 report that this is because they do not trust that the relevant authorities actually recycle the separated waste while 4 also feel that they do not know how to go about it as there is lack of information. In total, 7 respondents (30%) separate organic household waste (for compost or for organic waste collection), while of the 16 who do not, 14 report it's because there is no municipal organic waste collection in their town. 22 of respondents (96%) would be interested in learning more about organic waste reduction and would be motivated to engage in organic waste reduction at home, if it were easy to do so. The one respondent who answered negatively to both questions, reports that the reason is limited time availability.

Two-thirds of the participants (65%) report that they have received no information / classes / activities about organic waste handling at school. Of the 18 respondents who have children, half of them report that their children get some information / classes / activities about organic waste handling at school, either as part of a dedicated environmental subject, as part of another subject (such as biology, chemistry, etc) or through an extracurricular activity. Finally, when asked whether there is a body / organisation / authority they can reach out to in their town to get more information on organic waste handling, 21 respond that there is, indicating the municipal, regional and/or ministerial authorities as the appropriate bodies. In the final comments' section, 10 of the respondents clearly express a desire to learn more about organic waste management, including separation as well as home composting.

2.7 Romania



Desk Research

The amount of waste generated in Romania has been relatively constant over the past 10 years, with a slight increase from 5.044 million tonnes in 2012 to 5.768 million tonnes in 2021, with waste generated per capita going from 251 kg/person in 2012 to 302 kg/person in 2021. In the research carried out, it was not possible to identify relevant data on quantities of the organic fraction of MSW due to the lack of information available in the sources consulted.

According to Eurostat, the average recycling rate in Romania was around 20% for municipal waste in 2021, which is significantly below the EU target of 50% for 2020. In terms of waste disposal, around 60-70% of MSW is landfilled, while 10-20% is incinerated or treated in other ways.

Over time, some regions in Romania have adopted good waste management practices. For example, in the city of Cluj-Napoca, the local authorities have implemented an efficient separate waste collection system, which has helped to increase recycling rates. The city of Alba Iulia has also developed a household waste collection and recycling system which has been recognised as one of the most efficient in the country.

One of the main legislative instruments is Law 211/2011 on waste management, which sets the general framework for waste management in Romania, including organic waste, and provides measures for waste prevention, separate collection and recycling (Romanian Parliament, 2011). Romania has also adopted the National Waste Management Plan (PNGD) 2017-2030, which sets out specific objectives and measures to improve the national waste management system, including organic waste. The PNGD promotes recycling, energy recovery and other waste treatment methods, in accordance with the EU waste hierarchy. In the context of the circular economy strategy, Romania has developed the National Action Plan for the Circular Economy (PNACE) 2021-2030, which also includes specific measures for organic waste management. PNACE encourages waste prevention, separate collection of organic waste, composting and the use of composted products in agriculture and other sectors. Beyond these, there are a number of laws and regulations that demonstrate Romania's efforts to address organic waste management and implement measures to protect the environment and human health.

In Romania, separate collection is promoted by local and regional authorities through information and awareness-raising campaigns and the provision of dedicated containers for organic waste. Home composting is a popular method among the Romanian population, especially in rural areas where there is greater access to green spaces and agricultural land. In addition to home composting, some industrial composting facilities exist, which manage organic waste from the food industry, households and markets (Fărcășanu, 2019). In addition, community composting pilot projects have been developed in some cities, such as Cluj-Napoca and Bucharest, to encourage citizen participation in responsible waste management (Cluj-Napoca City Hall, 2020). Some biogas plants exist in Romania which convert organic waste into energy through anaerobic digestion, generating biogas and digestate, a valuable fertiliser. Currently, there are only a few incineration plants in Romania, used mainly for organic medical and animal waste (NEPA, 2020).

Schools and educational institutions have started to adopt organic waste management systems to promote environmentally friendly and responsible behaviour among students and staff. Composting projects have been developed in some schools in Romania to teach students about the benefits of this method of organic waste management and others have created school gardens. There are also numerous partnerships for environmental education between various non-governmental organisations / associations and individual schools / areas, but these are not part of government programmes or Ministry of Education initiatives.

According to Special Eurobarometer 501 (2020), 96% of Romanians believe that protecting the environment is important to them personally, and 29% of respondents said that waste and recycling is the most important environmental problem facing Romania. In terms of responsibility for protecting the environment, 39% of Romanian respondents believe that the government and public authorities have the greatest responsibility, while 33% believe that each citizen has an individual responsibility in this regard.

In terms of citizens' waste management behaviour, Romania has seen an increase in recycling rates in recent years; according to Eurostat, the recycling rate of municipal waste in Romania increased from 13.9% in 2015 to 18.1% in 2019 to 20% in 2021.

Public Survey

The survey's sample consists of 23 people who reside in Romania, with 20 of them identifying as female and 16 of them aged between 26-35. All of the respondents hold a higher education degree/diploma or above, with 22 of them having at least a University degree. There is a wide range of professions covered by the respondents, including public administrators, communication experts, educators, legal professionals, economists, project and assistant managers, salesmen, engineers and entrepreneurs. 18 of the respondents get their information from social media, either exclusively (6 respondents) or in combination with other sources.

In evaluating (from 1 to 5) their level of care regarding environmental issues, none of the respondents report no or little care (levels 1 and 2), 4 of them report that they do care to some extent (level 3), 10 care a lot (level 4), and 9 report a high level of care (level 5). In evaluating their level of care regarding the proper management of waste, 1 reports little care (level 2), 4 report that they do care to some extent (level 3), while 18 respondents report a high level of care (levels 4 and 5), 11 and 7 accordingly. See Diagram 11.

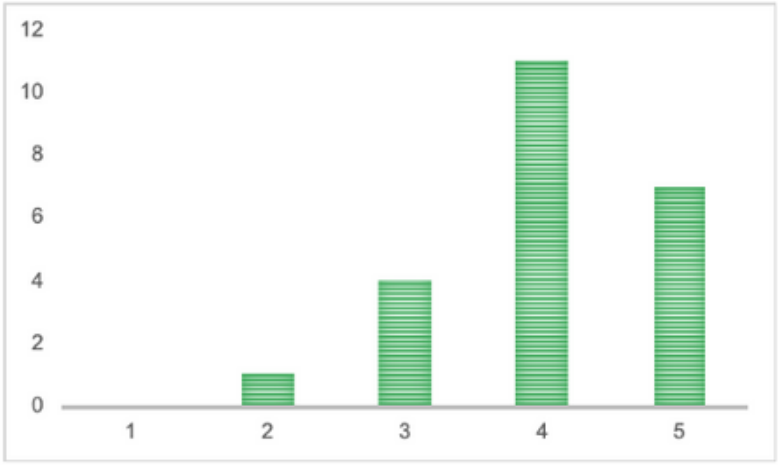


Diagram 11: Level of care regarding the proper management of all streams of waste | Romania

In evaluating their level of knowledge regarding the potential for reuse/repurpose of organic waste, 3 respondents report that they have little knowledge (level 2), 10 respondents report that they have some knowledge (level 3), 8 report good level of knowledge (level 4) and only 2 consider themselves as having very good knowledge (level 5) regarding the potential of organic waste reuse. When it comes to their level of awareness regarding the management of organic waste that takes place in their town/city, it is lower than the high levels of care reported about the proper management of waste. As Diagram 12 below demonstrates, 44% of the respondents feel that they do have knowledge about the local practice of organic waste management, while 26% have only little relevant knowledge.

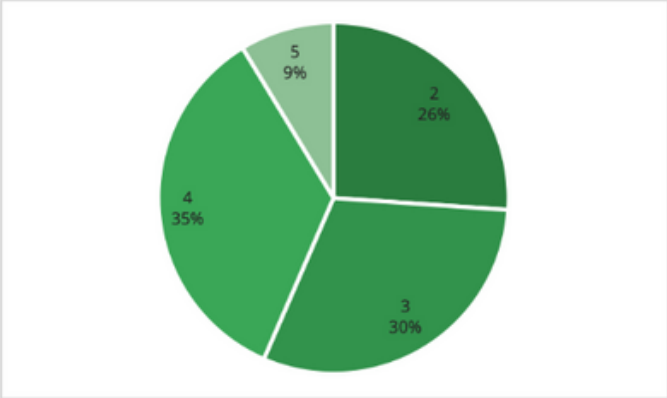


Diagram 12: Level of awareness regarding the management of organic waste that takes place in their town/city | Romania

Out of the 23 respondents, 22 reuse items regularly and 17 recycle regularly. Of the 6 who do not recycle regularly, 4 report that this is because they do not trust that the relevant authorities actually recycle the separated waste. In total, 7 respondents separate organic household waste (for compost or for organic waste collection), while of the 16 who do not, 7 report it's because there is no municipal organic waste collection in their town. 19 would be interested in learning more about organic waste reduction (the rest report not having enough time), while 22 would be motivated to engage in organic waste reduction at home, if it were easy to do so. The one respondent who would not engage in organic waste management reports it is because they don't trust the relevant authorities to handle the waste properly.

Only 3 respondents received information / classes / activities about organic waste handling at school. 7 of the respondents have children and all of them report that their children get some information / classes / activities about organic waste handling at school as part of another subject (such as biology, geography, home economics, etc). Finally, when asked whether there is a body / organisation / authority they can reach out to in their town to get more information on organic waste handling, 14 respond that there isn't.

In all, while as high as 95% of the respondents would be happy to separate their organic waste at home, less than half are aware of any separate collection or management of this waste happening in their towns and 61% of them have nowhere to reach out for relevant information. The findings point that citizens have the desire and motivation to engage on the issue but that there is a space for more awareness raising and a need for the relevant authorities to take more action towards organic waste management. All in all, the greatest issue in Romania regarding the management of organic waste seems to be the lack of involvement on the part of the public administration authorities.

Interpreting the data presented above and taking into account the specific context of Romania, we can identify that there is a lack of waste management infrastructure and facilities, which makes it difficult for citizens to adopt responsible organic waste behaviour. This lack of infrastructure may be the result of insufficient government investment in this area. There also seems to be insufficient education and awareness although the reported numbers of care both in the desk and the field research are high. Economic factors and living standards can vary significantly, which may make some citizens pay less attention to environmental issues, especially in the context of immediate economic concerns. Finally, the lack of success stories in organic waste management leaves citizens without clear role models and examples to follow.

2.8 Conclusions

When taking into account the whole sample of the 155 surveys from all six countries, the level of care about environmental issues in general is quite high, with 69% of respondents reporting that they care a lot (level 4 and 5), and only 5% exhibiting little to no care at all (levels 1 and 2). See Diagram 13.

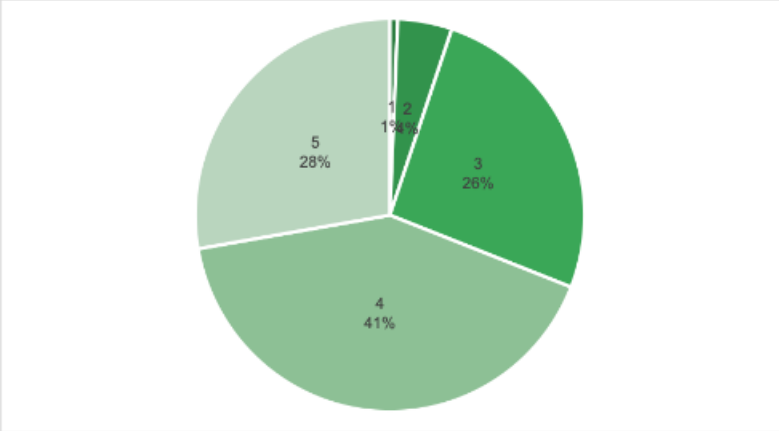


Diagram 13: Level of care regarding environmental issues

However, when it comes to the level of care regarding the proper management of waste, the level of care drops a bit, with 62% (100/155 respondents) caring a lot (levels 4 and 5) and 9% caring only little (level 2), as Diagram 14 shows.

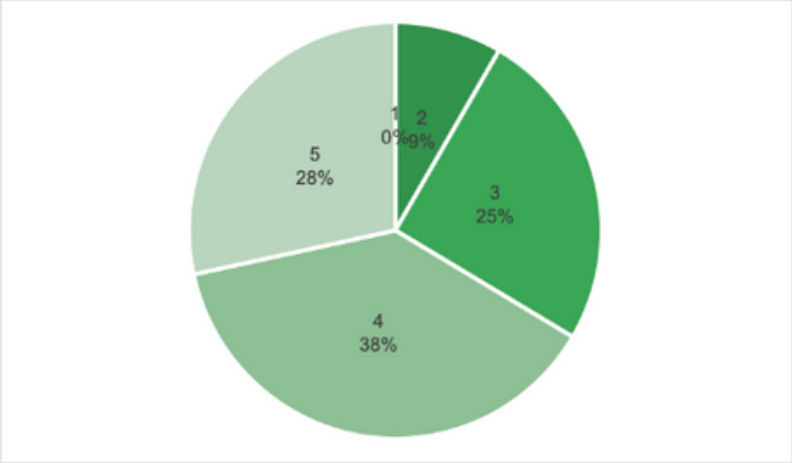


Diagram 14: Level of care regarding proper waste management

In terms of knowledge about the potential of organic waste reuse, and as Diagram 15 shows, only 41% respondents reported good knowledge (levels 4 and 5), while 24% report little to no knowledge at all (levels 1 and 2).

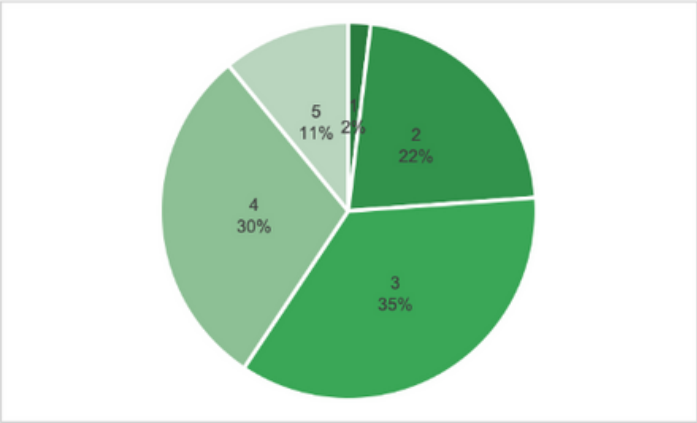
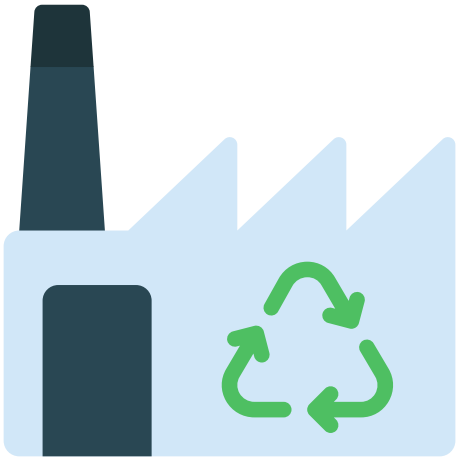


Diagram 15: Level of knowledge regarding the potential for reuse/repurpose of organic waste



Finally, the level of awareness regarding the organic waste management systems that are in place in their towns is even lower, with only 36% of respondents feeling that they have good knowledge about it (levels 4 and 5), while up to 31% have little to no knowledge at all (levels 1 and 2). See Diagram 16 below.

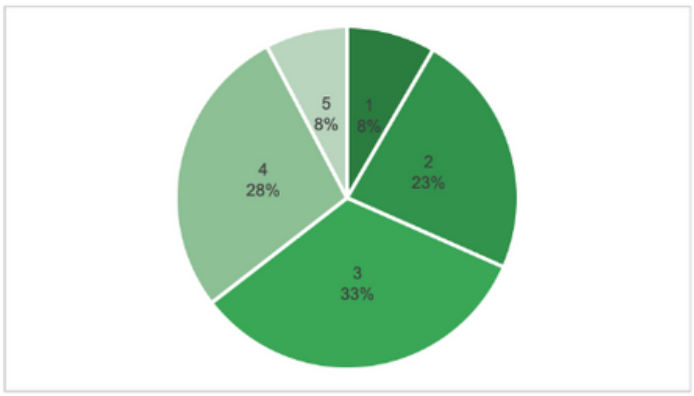
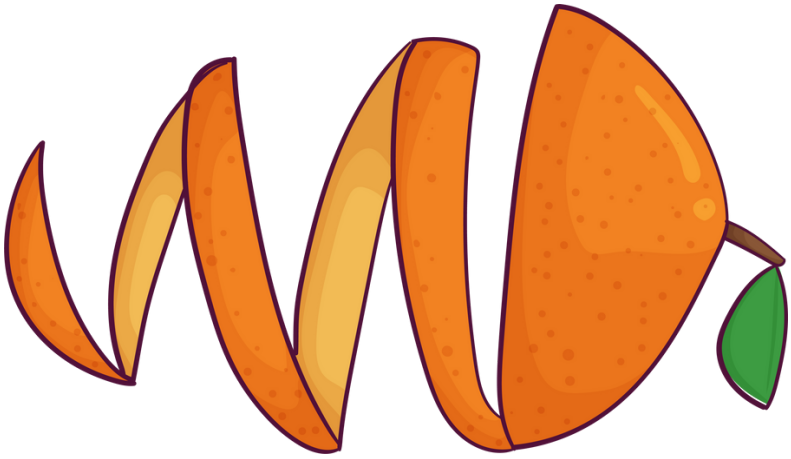


Diagram 16: Level of awareness regarding the management of organic waste that takes place in your town/city

These findings of the surveys show that although respondents do care about the proper management of the stream of organic waste, they do not have enough knowledge in order to engage in the proper behaviour. The findings from the surveys are in line with the findings from the desk research showing that although care and desire for the proper management of organic waste on the part of citizens do exist, overall organic waste is not properly managed, with some countries (Spain, Italy and Slovenia) doing better than others.



Behaviour is currently not ecologically sound while state bodies and structures do not provide the necessary information, tools and infrastructure for the citizens to engage in a more circular and sustainable organic waste management.

3.The state of environmental education

Environmental education (EE) in schools concerns knowledge that allows pupils to explore a range of environmental issues and to engage in problem solving with the aim to take action to improve the environment. The expected results are for pupils to develop a deeper understanding of environmental issues and to acquire the skills to make informed and responsible decisions. We consider it a foundational aspect of bringing about behavioural change and, in terms of education on the circular economy, we consider this to be a catalyst in accelerating the transition to the circular economy. There are many good examples around Europe of incorporating the circular economy into the curriculum, however these are fragmented and rare, especially in the countries involved in this project.

The European Commission calls for environmental sustainability to be at the core of EU education and training systems, and provides a range of funding schemes and programmes to support this. As such, several Erasmus+ KA2 projects are centred around promoting environmental education, and more specifically circular economy education, while there are multiple european networks aimed exactly at supporting teachers and trainers with the tools and materials to engage in environmental education. In April 2022, the Commission published a proposal for a Council Recommendation on learning for environmental sustainability to support Member States in equipping learners with knowledge, skills and attitudes needed to act on sustainability, climate change and biodiversity loss.

The focus of the project and its target is secondary schools and teachers, although the standards, laws and documentation. This aimed at providing a baseline of what the official research was expanded to include environmental education in both primary and secondary schools. The desk research was undertaken in order to acquire a clear picture of the state of environmental education in each country, according to the public education system's structures, guidelines, provisions and teacher training for environmental education are in each country, where (if at all) and how it fits into curricula, what frameworks are in place to support it within the education system.

It additionally looks at the broader framework of environmental promotion and change, and whether educational policies for environmental issues are backed up with policies and practises for recycling and environmental protection or links to other ministries and agencies that manage environmental issues, to provide a 'joined up' approach to environmental behaviour.

3.1 Research Tools

The field research consisted of interviews with educators, pedagogical experts and education officials. These are a vital aspect of the research as they will provide us with primary evidence and data, expressed by the people engaged in environmental education, in the manner that they choose to convey it (that is, through open-ended questions that invite discussion and opinions). Through the desk research, data and knowledge about the official structures can be discerned, which is one significant part of understanding the state of environmental education in a country, but this does not necessarily reflect reality or the experience and opinions of environmental education in schools, in practice. Therefore, it is essential to interview educators about their experiences, knowledge, training and daily interaction with the education system with regard to environmental education, as they experience it through their work in practice.

The interviews took the form of a dialogue and discussion, posing broad questions and offering thematic areas for interviewees to respond to, allowing for the greatest freedom of expression of the respondents as possible. As the issues are complex and multi-faceted, it is essential for opinions from the people 'on the front lines' to be expressed in the way that they choose. As such, the interviews were in-depth, lasting approximately one hour. This investment of time, provision of space to express freely, and consideration of the interviewer of the experience, knowledge and expertise of the educators supports ongoing efforts of the organisations to work with teachers on environmental education projects.

The research paradigm and methodology chosen for the interviews was a critical realist approach. This was selected as it allows for the greatest freedom of expression of both the respondent and the interviewer while simultaneously providing a broad framework which offers overall consistency so that the data is able to be analysed and used in conjunction with all of the other interviews and data-sets. Respondents were assured that the interviewer was not seeking a specific answer, but rather a joint exploration of the issues within a broad framework. Analysis of the interviews included not only what was said and the opinions presented, but also the overall demeanour, emotion and manner of expression of the interviewee, as well as what was not said, bearing in mind their relationship with the interviewer.

We aimed to interview 20 educators per country and completed 136 interviews in total. These were carried out in a variety of ways including one-on-one interviews which took place in schools, in offices, or online. In some cases, focus groups were carried out, which allowed for interaction among the respondents, contributing to the aim of acquiring in-depth, qualitative, narrative data. For each of the six countries, the study will present the findings from the desk research carried out on the current state of environmental education as well as the results of the interviews that were conducted with educators of the participating countries.

3.2 Spain

Desk Research

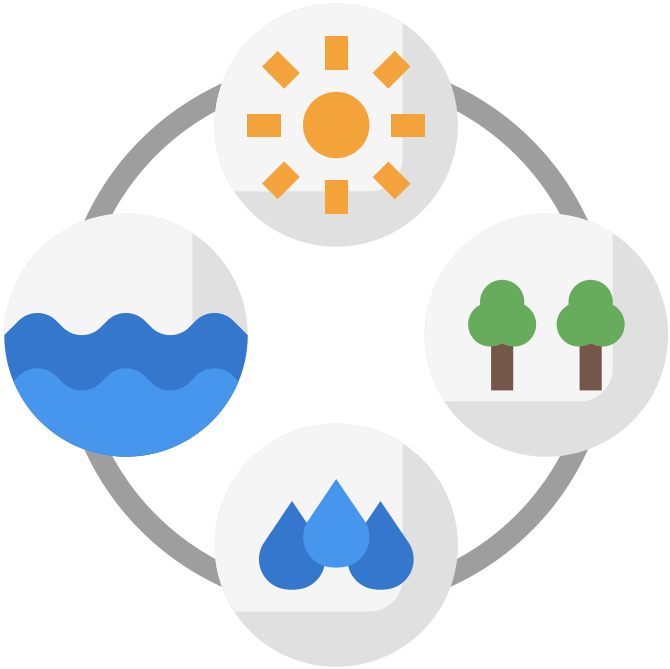
Policy, framework and content

The contents, subject matter and teaching hours of schools in Spain are set out via the Royal Decree 217/2022, which established the organisation and minimum teaching requirements of Compulsory Secondary Education (LOMLOE). This decree is currently being transposed into different decrees in the different Autonomous Communities of Spain, to then be rolled-out into practice. In the case of the Basque Country, the new curricular decrees have been drafted and are expected to come into force this year, which is why they have been analysed in order to answer these questions.

According to LOMLOE, biology and geology should both be taught in Compulsory Secondary Education in which explicit reference in both is made to environmental issues. In addition, the law also describes the subject of Education in Civic and Ethical Values, which must include, among many other things, approaches to education for sustainable development, or the integration of scientific, technological and organisational content.

Despite the positive approach to the obligatory inclusion of EE issues in both science and social science classes, these subjects are not given anywhere near as much significance or time as other core subjects.

The compulsory classes on 'Education in Civic and Ethical Values' are divided into 3 sections: the first focuses on self-knowledge and moral autonomy (including rational deliberation of issues, recognising one's own aims and motivations etc), the second looks at society, justice and democracy, and covers issues such as equality, social frameworks, identity, diversity and the values with which we interact with the environment; the third section works specifically on sustainable development and environmental ethics. It is implemented through interdisciplinary work and the cultivation of system thinking around relationships of interdependence, interconnection and eco-dependence that exist between the natural and social environments.



In the biology and geology classes, environmental issues are approached not only from a scientific angle, but also includes discussion on ecosystems and human behaviour. It aims to not only instil knowledge, but also promote habits that minimise negative environmental impacts. Both of these classes include issues of climate change, the importance of human action to preserve biodiversity and the relationship between the natural world and human behaviour.

Furthermore, in accordance with Law 3/2020, companies and entities managing catering, or school canteens, in collaboration with schools, must establish educational programmes to reduce food waste. This is extremely important to reinforce the environmental and organic waste management concepts and practices learned in class by students. If they see that the school practices sound environmental management, they are more likely to engage in habit change, rather than simply regard the EE in the classroom as a 'topic' to learn and not necessarily use.

Teaching methodologies

Although in recent decades there has been a shift towards more active and student-centred methodologies (e.g. inquiry based learning, problem based learning etc.), 'traditional' methodologies still dominate. Likewise, the main learning environments are the traditional classrooms and, therefore, outdoor learning is still scarce and mainly limited to a few field trips and/or specific learning activities. Generally, teachers throughout Spain can use additional materials in their classrooms as they wish, which means that although some teachers utilise creative and innovative materials, others do not, so the quality of EE varies depending on the teacher.

In Biology and Geology, because these subjects aim to promote and funnel students towards specific vocations, scientific methods of learning are generally used. However, group work, project work (promoting critical thinking, planning and cooperation skills) are also encouraged. Critical thinking is greatly supported in the teaching methods in these subjects and connected to the real world through encouraging students to think critically about the pseudo-science and unfounded popular knowledge that is steadily increasing.

In the classes on Education in Civic and Ethical Values, dialogue, participation and cooperation are encouraged, along with the free expression of ideas and critical thinking, within a framework of respectful civil interaction and debate based on facts, not personal attacks. Teachers integrate real world contexts into teachable activities in the classroom to foster the development of active citizens, committed to not only human equality and diversity, but also environmental values and action. In the Basque Country, these classes may involve stays in environmental education facilities, exchanges in environmental centres and other activities outside of the school.

In the Basque Country, training on environmental and sustainability issues is offered to teachers (who are already qualified and working). The training processes take place in the educational centres themselves and in the context of the teachers' work.

Despite this framework and infrastructure for the promotion of environmental education and the professional training of teachers, there is no system of evaluation or accreditation of the quality of environmental education programmes. Similarly, this does not exist for learner-centred active methodologies either. In any case, the professional training of teachers is developed progressively hand in hand with the pedagogical orientations established in the curriculum and the curricular projects of the centre.

Even if new curriculum reforms emphasise the importance of active learning methodologies, reform alone is not sufficient to alter and modify the teachers' practices. What is needed are changes in the beliefs, habits, roles and power structures of teaching as well as developments in pedagogy.

Such a radical change also requires new principles and practices in teacher education. Thus, processes of change must be analysed to understand if curriculum reform has been transferred effectively to teacher education culture.

Analysis and interpretation

The new curriculum decree (LOMLOE) introduces the ecosocial perspective, together with an interdisciplinary approach to address contextualised learning situations. This ecosocial perspective is explicitly included in the key competences that define the learner's exit profile (Citizenship Competence 4, p. 31), as well as in the specific competences of the different disciplines. However, this ecosocial approach is subordinated and diluted among the rest of the competences, and the definition of a specific key ecosocial competence is missing, as has been demanded by different forums and agents.

On the other hand, the LOMLOE decree establishes elementary bases and contents, which offer much scope for developing and/or specifying curricula at regional or school level. This may represent an advantage in terms of developing projects focused on specific themes or problems and which allow for the development of defined competences. Similarly, the main ecological problems are present in the contents of the decree (i.e. climate change, waste management, soil...). In this sense, organic waste management can offer a representative and meaningful context to work on these problems, as it is directly related to the mitigation of climate change, reduction of waste, ecological cycling of matter, soil restoration and/or improvement, as well as environmental and human health.

Within the broader framework and context of environmental protection and the need for large-scale social change, there is growing social pressure to promote systemic change through education. These movements are articulated through different organisations, such as 'Fridays for Future', Teachers for future etc), and put pressure on institutions at different levels for transformative and committed action.

Interviews with educators

All of the respondents emphasised the need to integrate environmental education into the educational curriculum, which they feel is currently lacking. Within the current system, they feel that EE is not regarded as sufficiently important to be included systemically and whether students have any EE or not, depends heavily on whether the teacher is interested, aware and willing to engage in it.

It was also mentioned regularly, that current curricula are extremely full with what are regarded as the 'more important' subjects and there is little time for EE. It was also stated that there is a lack of resources in the education system in general, and a lack of training in appropriate methodologies. Holistic approaches need to be taken to EE and must involve interaction with nature, not simply sitting in a classroom. It was noted that the receptivity of pupils and their families is also an issue to take into consideration with regard to EE: in areas with vulnerable families or low income groups, it is difficult to promote EE and its practice as people are focused on studying subjects which will lead to better jobs.

The main issues and concerns most commonly raised by the educators include a lack of awareness of EE and environmental issues in general, a lack of collective responsibility, lack of cooperation with other branches of local/central government (that is, there is no integration of EE with the sanitation / environment departments) and the high pressure of teachers' working conditions and the lack of training offered on issues and methodologies for EE. Many teachers are in favour of carrying out EE in classes, but only a few actually enact it.

In addition, some of the interviewees showed a pessimistic opinion about the knowledge and attitudes of the students, indicating that the problems of engaging in EE are not only issues of a lack of support from the educational authorities. In secondary school in particular, respondents said that the topic of the environment does not interest students of this age group, but simultaneously pointed out that there are not many materials on the subject, or interactive ways to teach them, and that, within the teaching staff, attitudes are also negative, which makes it difficult to change the way of doing things.

Interviewees also highlighted the role of the wider society in issues of EE, with strong criticism for the institutions of government but also positive comments about the work of some social movements. These issues influence how the students regard environmental education. The respondents mentioned the wider social context to emphasise the transformative character of EE, but pointed out that it requires institutional and political commitment, along with the educational aspects.

Another challenge mentioned was that of 'greenwashing', which implies that the messages transmitted by the media make young people believe that the problem has already been solved, which can lead to a lack of motivation and action. Wider 'eco-literacy' as well as 'media literacy' is therefore required to allow children to develop the critical thinking skills to be able to discern biassed information. These aspects of education need to be applied consistently throughout the education system and in each year of school (not simply introduced in a class in elementary school and then abandoned).

It is clear from the responses that educators regard environmental education as fundamental to facing and tackling the current environmental challenges. However, they expressed that they often feel that society makes them responsible for raising awareness among students (on a wide variety of issues), and place the burden of informing children about environmental habits solely on them. They make it clear that there is a vital role for educators in changing environmental attitudes and habits, but that this can only be part of the approach to bringing about change. There needs to be good examples set in the family home and cooperation with local services/institutions so that there is a wider 'joined up' societal effort which supports the work that the teachers are doing.

Respondents also clearly stated that teachers need to be trained in EE, and any environmental programmes on a local level, need to include school visits and teacher support, so that pupils can see that the ideas they learn about, are being put into practice.

With regard to the circular economy and organic waste management, many expressed that society considers it to be an uncomfortable or even dirty burden. They believe that it is given little importance because the results are not visible at first sight, or do not have a direct impact. For this reason, they argue that it would be necessary for state institutions to provide more information to schools (or visits) on the processes that are being carried out at municipal or state level and on the consequences of social neglect. They also believe that changing environmental habits requires collective responsibility, and that many young people feel that their individual effort cannot make a difference, especially when so many other people do not engage in environmentally responsible habits.

In addition, there are contradictions between attempting to include EE in schools, and the reality of the students. Adding another academic subject does not create behaviour change in itself. It requires holistic, hands-on learning 'in' the environment, outside the classroom. There is also a lack of good materials for teachers to use, both in terms of content and methodologies, and a lack of ways to create 'hands on' experiences connected to them (e.g. a garden in the school, a composter etc). Many respondents stated that it is important for the whole school (cleaning staff, cafeteria staff, teachers etc) to participate in environmental actions (e.g. composting unused food from the cafeteria, recycling rather than throwing away etc) to offer students a way to see how the theoretical issues are put into practice.

Finally they pointed out that there are currently more qualified EE teachers and trainers than before, and a lot of didactic materials. They highlighted the need for outdoor education to emphasise the value of nature, not just learning facts about it. They mentioned that involving emotions and feeling a connection to the outside world is a vital aspect of education to protect it. However, there is a lack of will and resources (teacher time, gardens, composter, access to the natural world) to carry out hand-on activities that are essential to converting environmental knowledge into habit change.

The respondents mentioned working conditions as a point to be improved if teachers are really to be able to assume part of this collective responsibility, that is, more resources and paid time for teaching EE. Many additionally mentioned the temporary nature of contracts (which leads to a lack of investment of time and effort by the teachers) and, on the other hand, the lack of context, i.e., that in many cases they do not know the characteristics of the city or the neighbourhood where they work (as they are placed wherever they are needed).

They further state that one of the greatest challenges is found in the educational institutions themselves, in terms of the lack of decision making by the departments, or the support of the curriculum to carry out different multidisciplinary projects. Another aspect to highlight is the lack of time and the teacher-student ratios that undoubtedly make it difficult to carry out any new classes or integrate new materials into any classes in secondary schools.

There is also a discernable dissociation between the theoretical contents of an EE class, and the interest shown by the students towards the circular economy. In order to bring about habit change, it is clear that it is not enough for students to learn the content of the materials, it is necessary for them to apply the theory and knowledge in a practical manner, in direct contact with nature. They note that gardening and composting and trips to forests etc are often carried out in primary school, which do sensitise children to environmental issues, but this is not continued in secondary schools and there is no effort to link the practical activities in nature at a primary level, with theoretical knowledge about environmental issues at a secondary level.

Moreover, most of the interviewees expressed concern about the global ecological crisis and the inability of governments to offer solutions to major problems. They believe that this pessimism spills over into the classroom. Once again, the wider socio-political and media context has a direct effect on pupils' willingness to engage in EE. They also expressed that the lack of a systemic approach to the environment (no coordination across ministries of education, environment, sanitation, and local municipal systems and initiatives) greatly affects the pupils' interest in environmental habit change as they see state and local systems failing and not setting a good example.

3.3 Greece

Desk Research

Policy, framework and content

The research in Greece-looking at the Ministry of Education's curricula-showed definitively that environmental education is not treated with the same significance or regarded with the same value as other subjects (those required for exams). There is no dedicated class provided throughout the education system that focuses specifically on environmental education. However, according to the national curriculum, there is one class on 'Environmental Study' at elementary/primary school level. At the middle and high school levels, there is no specific class on the environment, but aspects of environmental issues are included in 'Geology - Geography' and 'Home Economics' classes (middle school). There are no specific classes on environmental/ ecological issues beyond Grade 8.

Environmental issues are integrated into other subject-specific classes. For example, Biology classes throughout the school levels cover themes on ecosystems and plant life, while in Grades 11 and 12 there is some focus on Applications of Biotechnology in agriculture and animal farming. The Geology - Geography in Grade 7 class briefly covers climate change, while in Grade 8 it looks at energy production and consumption (incl. RES) and briefly discusses land use. In the curriculum of the Home Economics subject in Grade 7, the chapter on Ecology and Housing describes basic concepts about natural resources and energy and gives basic advice that can be applied at the household level. However, these are introduced as knowledge to be learned by rote, rather than issues that can translate into behaviour change or action. Furthermore, the Social and Political education classes do not include aspects of environmental issues. Thus, there is no connection between the community and political framework around environmental behaviour and the scientific facts learned in biology or geography classes.

Since 2022, Skills Workshops have been integrated into the mandatory curricula of kindergartens, elementary and middle schools. This addition aims to cultivate and strengthen soft skills, life skills and technology and science skills (STEM skills). There are 4 thematic sections: "Live Better - Live Well", "I take care of the environment", " I am interested and active" and "I create and innovate". The "I take care of the environment" theme includes references to natural disasters, ecology, as well as global and local cultural heritage.

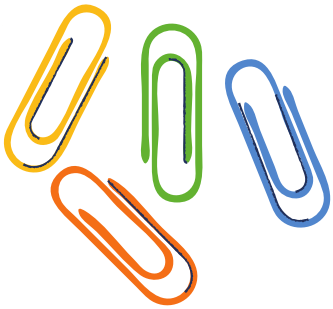
There is a network of the so-called 'Environmental Education Centres' across Greece, which are decentralised public educational structures of the Ministry of Education, which aim to promote environmental education and provide support at local, national and international level. The ultimate goal is awareness raising and cultivation of environmental consciousness.

They develop education methods and supporting materials which are promoted and implemented with a view to the protection of the Environment and Sustainable Development. The implementation of these Environmental Education programs, for all levels of education, and the support of the corresponding school programs, happens in collaboration with the Heads of Education Departments. They also organise events and activities and promote research in the field of Environmental Education. In addition, schools often organise school visits to places of interest, relevant to the themes of the environment and sustainability.

Teaching methodologies

When it comes to subjects that are part of the national curriculum, teaching methodologies are rather old fashioned and the content is simply delivered to students, in a 'lecture' style. When it comes to the implementation of the Environmental Programme, it is at the discretion of the teacher to decide how to carry out activities. Therefore, the quality and methods may vary greatly from one school to the next. The Environmental Education Centers promote interactive teaching and learning methods, through the educational and support material they provide.

Teachers are not necessarily trained or confident in practising learner-centred methodologies and 'activity' style classes, but this will differ greatly depending on the teacher's interest in engaging in interactive teaching methods. It is at the discretion of teachers to decide how they will conduct their teaching, but without learner-centred training in departments of pedagogy in universities, teachers who wish to gain these skills will have to do so on their own time and with their own resources. Therefore, most teachers are not confident or even necessarily aware of how to elicit creative expression, facilitate team activities or engage children in fun, problem-solving ways to investigate environmental issues.



Supplementary materials on issues of organic waste would be allowed in classrooms, but as long as the materials and the information required by the Ministry of Education is also covered. Despite the favourable climate conditions, Greek schools and classes are not familiar with 'outdoor education' and the essential contact with the environment around us and as such all the experiential and empirical knowledge required to develop the relevant attitudes and behaviours attached to environmental education are difficult to incorporate in the Greek classrooms.

Analysis and interpretation

There is a clear lack of 'joined up' thinking about environmental education in Greece. It is delivered in a manner that is inconsistent throughout the educational levels, and fails to connect the scientific facts and knowledge with the behavioural, social and political framework of everyday life.

The guidelines on education in general, is centralised. The Ministry of Education is the body with the authority to approve change. The system is therefore very 'top-down'. Teachers and local educational officials could initiate dialogue, but the change needs to be approved by the Ministry. The Institute of Educational Policy is a scientific body with the objective to carry out scientific research and studies on all aspects of education, including both teaching and learning, and to provide scientific and technical support in the design and implementation of educational policy. Teachers and other educational bodies and officials can raise questions and concerns directly with the Institute, which often works as a bridge between the people (bottom) and the state (up).

Therefore, it is very difficult to change the status-quo. There is no initiative from the top to change environmental education in schools, and initiatives from teachers, parents and schools are processed by the Institute and Ministry extremely slowly.

With regard to teaching methodologies, teacher training tends to emphasise and focus on teachers needing to know their subjects thoroughly, with little discussion or practice of pedagogical methods or approaches. This means that teachers are often left either with the implied notion that they 'hold all of the knowledge' and their job is to 'give it to the students' ('banking' method of teaching) or lacking the confidence to be able to plan a class in which students can come up with ideas and offer their knowledge and experiences, for fear that the teacher might not be able to 'control' the class or might not 'have the correct answer' to a question or idea.

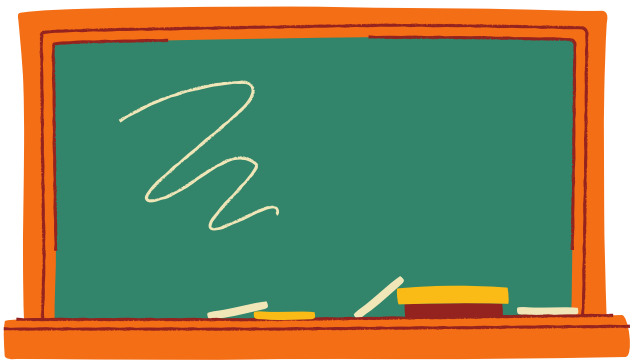
Part of the reason why this lack exists in teacher training may have to do simply with the quantity of information that teachers have to 'deliver' within a semester, per class, and the fastest method to cover a large volume of information is to do so in 'lecture' style. With extremely strict examinations at the end of high school (which require a lot of rote learning and determine which university a student will go to), there is a lot of pressure on teachers to get through the content dictated by the curricula quickly, and thus little incentive for training teachers in participative, learner-centred teaching methods.

The level of knowledge of the teachers themselves on matters such as the circular economy or organic waste management can be very indicative of the current state of environmental education. At the moment, this seems to be at a low level in Greece.

In addition, when thinking about environmental education for behaviour change, we need to consider the wider social situation beyond the school. If parents are not educated and do not practise good organic waste management at home, whatever students learn in school is in danger of being undermined. This risk is further exacerbated by the failure of the management of recyclable streams in Greece, which does not provide students with good examples of waste management beyond the classroom, which can be de-motivating and lead to the abandonment of good habits.

Interviews with educators

Interviews were undertaken with educators currently working in secondary schools (middle school and high school), teaching in both public (state) and private school systems, in both the general high schools and also the technical / professional oriented high schools. Many of the educators also have a wide range of previous teaching experience in a variety of educational settings - elementary school, special needs education, tertiary education (IEK), teaching adults etc. All of the interviews were undertaken on a one-to-one basis.



The overarching themes expressed unanimously by the respondents is that, in their opinion, there is very simply, not enough environmental education in schools in Greece and also that EE is essential to changing behaviours and habits and therefore crucial to the fight against the climate crisis. There was an overall sense of disappointment in the lack of time in the curriculum devoted to EE, the lack of interest from school directors and decision-makers, and the lack of support for teachers.

The majority of respondents stated clearly that EE is not valued as a subject in Greece, nor regarded as an area of 'specialisation' and is not given space in the curriculum. Respondents stated that EE is very often not carried out at all at the secondary level, and where it is present, it is either piecemeal (e.g. a project lasting for a week, or some mention of EE in classes on biology, geography, home economics, social studies etc) or done entirely on the initiative of individual teachers.

Many respondents conveyed that where there is some form of EE in schools, the approach is usually theoretical and content is delivered in a 'lecture' style, rather than in a manner that encourages inquiry, interest, practical engagement and behaviour change.

There is often some EE carried out in primary schools which takes a practical and experiential approach, such as nature walks, planting fruits and vegetables etc. but it is not compulsory. Any initial introduction to EE in an experiential way is not followed-through in a systematic way in middle and high schools.

One particular strand of distinct disagreement among the educators is reflected by the current discourse in Greece with regard to EE. One set of interviewees felt strongly that EE should be an obligatory 'separate' subject in schools, with teachers trained specifically in all aspects of EE. The other set felt strongly that because environmental issues include and involve many disciplines and sectors of sciences, social sciences and human behaviour, EE should be integrated into a wide variety of classes in a 'cross-cutting' and joined up manner and also through skills workshops.

The responses show that all of the respondents are frustrated and disappointed at the lack of support (financial, resources, practical help, bureaucratic) for EE and for teachers trying to incorporate and carry out EE in schools.

The findings explain that educators already feel overworked and under a huge amount of pressure to 'deliver' what is already a very challenging and full curriculum in time for exams. It is therefore not only very difficult for them to find the time in class to address EE issues, but when they do, they find that the children are often not necessarily responsive or receptive. Secondary school children have very tight schedules and have to learn a lot of content and information in order to pass exams, so even when a teacher can incorporate EE, if it is not part of the required text book of a class (and therefore won't be on an exam), students have little motivation, time or energy to engage with it.

The responses expressing disappointment can be additionally explained by the lack of support for teacher training in EE. While there are sometimes seminars or training sessions, these are always voluntary, and therefore are attended by teachers who are already interested in the topic, on the teachers' own time, rather than with remuneration.

Furthermore, many respondents pointed to the lack of 'joined up' approaches between ministries, initiatives, local government and the practicalities of waste management systems that the children see and experience every day. Although the Ministry of Education has EE aims and initiatives to include it in schools, because there is no coordination with other branches of government or the reality of environmental systems through local government, children have no motivation to engage in better ecological behaviour on an individual level, because they see poor ecological behaviour on a daily basis on a city wide and nationwide level.

Respondents expressed frustration and disappointment as well as pessimism about the future of EE, as well as their anger that their efforts don't seem to motivate colleagues or schools to do more around it, not only as a classroom subject, but also in practice in schools (recycling, composting, etc). This pessimism extended to the broader social context and their opinion that there is little collective responsibility around EE and general environmental behaviour in society.

Many respondents raised the issue of the lack of teacher pay for the additional work involved in undertaking EE and lack of payment for attending training sessions on it.

An important point raised by more than one respondent, is that when there are EE programmes undertaken for a week or a month, they are very often 'done to be done' (to fulfil some kind of criteria or box-ticking) or 'done to be seen'. The urban/ rural divide was also mentioned in connection with access to EE programmes. In many rural areas, villages often only have primary schools, so children attending middle and high schools often have to take public buses every day to a school in a larger town or village. This therefore means that they cannot always stay after school for extracurricular activities.

Respondents also brought up the topic of a lack of 'good examples' by the local and national authorities and society in general of collective responsibility. Even if some attempts are made within schools to work towards behaviour change through EE, children see that adults, local governments, public systems etc are not taking care of the environment which leads to demotivation for individual behaviour change and feelings of powerlessness.

One very interesting point raised by a respondent is with regard to the lack of awareness by the authorities about what appeals to the public, and how this leads to the failure of public education campaigns. He pointed specifically to the introduction of the organic waste bins.

3.4 Slovenia

Desk Research

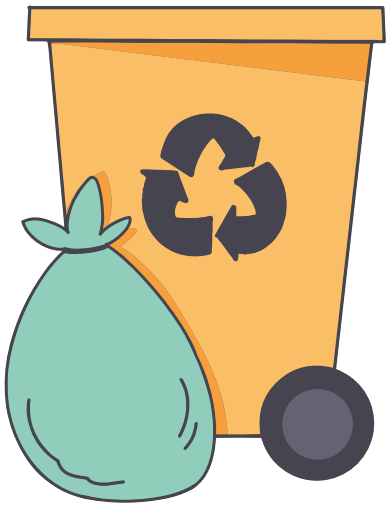
Policy, framework and content

The Basic (Primary) School Act in Slovenia mandates that a specific programme 'Learning about the Environment' is implemented in all schools for the first 7 years. In addition, 'Natural Sciences and Technology' and 'Natural Sciences' also focus on environmental studies. Legally, all subjects are treated with the same importance. However, when it comes to the amount of time each subject is given in the classroom, subjects related to environmental studies take up less time than other 'core' subjects.

There are no specific exclusively environmentally focused subjects beyond Grade 7, but aspects of ecology are covered in biology and geography.

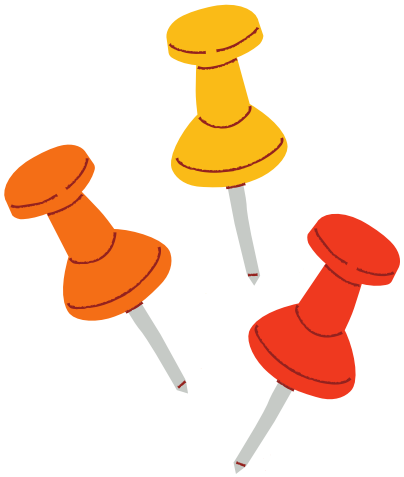
In the general high school system, environmental themes are included in Biology, geography and sociology classes, but these subjects are not compulsory for all schools, and if they are, they usually last only 1 year, with more years being non-compulsory. Schools, primarily focusing on the environment, such as Biotechnical centres, Secondary School of Civil Engineering, Secondary School of Woodworking and Secondary Environmental School discuss environmental issues more in-depth over a range of different subjects.

In addition, an obligatory class called 'Household' is implemented in years 5 and 6 which includes some issues of eco-conscious consumerism, household waste etc. This subject offers a mix of social and environmental studies. However, other social study classes have no mention of environmental issues or obligatory need for discussing them.



School students can choose to engage in extra-curricular environmental activities, but this depends on the school and the teachers, and what they can provide. There are some national and European initiatives/projects that cover the themes of environmental education, in which primary and secondary schools can choose to participate in.

Teaching methodologies



Specific subjects are taught in different ways, and with different levels of interactivity depending on the content, but teachers are encouraged to teach in an interactive, hands-on learning approach. The curriculum for Natural Sciences for year 6 of primary school, stresses that teachers should encourage 'learning through discovery' and using real life and everyday examples, together with group work and role play / games. It recommends that at least 40% of these lessons should be based on active working methods and experiential learning.

Teachers are therefore encouraged to provide added value by offering real-life practical knowledge. This can be done via classes outside the classroom. Teachers are trained (as part of their university classes in pedagogy) on learner-centred, creative, interactive methodologies which foster critical thinking, problem solving and teamwork. Supplementary materials (not produced by the government) are allowed to be used in schools, at the discretion of each teacher.

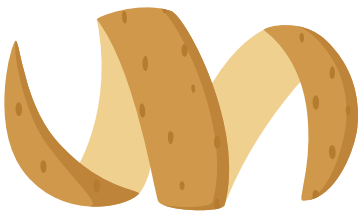
Analysis and interpretation

Environmental education is adequately covered in the first 7 years of education throughout different subjects, which adds to the multidisciplinarity. Students participate in practical work and receive some level of real-life experience. During the remaining compulsory school years, the amount of environmental topics and time given to them reduces, with it fluctuating greatly from secondary school onward depending on the general curriculum of each school. More environmental education on higher levels of education should and could be put into action.

Nationally regulated school curricula (top-down approach, approved by the Ministry of Education) take many years to change and put into practice. There have been initiatives and plans on changing the curricula to include more sustainability themes throughout all subjects. It also depends on the current coalition and ideology of the political party.

Teachers can choose to provide extra-curricular activities or elective subjects on the topic, but rarely do as this takes time and effort they do not get well compensated for.

Slovenia is one of the most environmentally conscious and sustainable countries in the EU. Slovenia is also one of the European countries with the highest recycling rate for municipal waste (59%). The recycling rate of all waste (excluding major mineral wastes) was almost 83% in 2020.



Interviews with educators

The respondents stated that environmental education is very well covered in the early stages of education – kindergarten and the first 3 to 5 years of elementary school. Topics such as recycling, food waste and reusing are talked about almost daily, as children spend a lot of time with one single teacher (rather than going to a variety of different classes for different subjects). In addition, experiential learning (such as finding out what happens to leftovers after lunch, picking up rubbish on nature walks etc) about environmental issues takes place regularly and in a learner-centred manner. However, as the demands of the information-heavy school subjects increase in middle and high school, environmental issues are talked about as part of obligatory education, but in a manner that simply 'delivers information'. There is also a significant disparity in secondary school students' knowledge of environmental issues, depending on which type of high school (general vs. vocational and which direction of study) they attend. Respondents unanimously felt that more needs to be done in the later stages of education.

The interviewees, in general, expressed that although environmental education is present in the curricula or is included through various projects that try to address young people in the direction of sustainable development, it is too abstract and theoretical (rather than hands-on and experiential), lacking in terms of materials and methodology, and not consistent. Although Slovenia is one of the most sustainable countries in the EU, systemic and comprehensive EE is lacking in schools.

Most of the respondents were quite passionate about the topic of EE, clearly expressing their anger at the lack of improvements and the feeling of helplessness.

The interviewees expressed that the need for education on environmental issues is urgent because of the immediate and critical issue of climate change. They felt that the National Education Institute (which produces curricula) has been far too slow to respond to the urgency of the need for EE and have not put in place systems which can allow for EE as a subject on its own, or as part of other disciplines and classes. This delay in creating useful EE is worsened by the problem of educators not having access to the materials and relevant skills to teach EE. They felt that environmental issues should be included on a national level in curricula (as a topic in itself or integrated across classes), and felt that there should be more and better training on EE for teachers, made available.

The single biggest challenge at the school level was identified as simply a lack of time and complex bureaucracy. Even if schools wanted to implement their own initiatives, e.g. composting stations and workshops about organic waste, the legislation does not allow them to do so, as waste can only be collected via an external contractor.

On a personal level, respondents also noted the lack of interest from pupils and 'rebellious teenage behaviour' which they say leads to deliberate mismanagement of waste, in order to simply annoy teachers or parents. They also pointed to a lack of modelling of good habits at home by parents, around issues of waste. They further stated that young people are also not critical consumers and are often influenced into purchasing cheap, not environmentally friendly products.

Respondents mentioned that there have been changes and improvements in recent years (EE is on the national curriculum as an obligatory subject in elementary schools, and there are plans to include it in an integrated way throughout the current high school subjects), however, they have been extremely slow and insubstantial.

Another major challenge is the inconsistencies between talking about the environment and actually engaging in ecological change in practice. Even when schools teach about climate change and waste reduction, pupils see that their neighbourhoods are having green areas reduced, trees cut down, more concretisation and see the lack of recycling bins, rubbish on the ground etc. Therefore, in order to be effective, there needs to be a more 'joined up' approach between the education department and the local environmental and sanitation departments.

In primary schools, there is a decent level of EE, usually carried out in a practical way (a school garden, nature walks, school bee-hives) whereas there is much less emphasis on this in secondary schools, in which global environmental issues are discussed, but purely as 'in classroom' theoretical topics, without and direct connection to nature.

In secondary schools, EE is part of the curriculum, integrated into other subjects (e.g. biology, household studies). The curricula aren't very detailed, which for a teacher skilled and knowledgeable about EE, means that they can work on these issues in whatever way they please, but for teachers without relevant training, the materials are not as informative and helpful as they should be. The quality of EE therefore depends to a great extent on the training and interest of the teacher.

While there are various programmes and European projects for schools on EE, these are extra-curricular activities and therefore voluntary.

Linking the issues of EE in the classroom to school practices, they also talked about the huge amounts of wasted food in school and the wasted opportunity to engage in EE in practice through this. They felt very strongly that discussing the issues in the classroom, without any practical implementation of environmental habits, undermines the point of environmental education.

3.5 Italy

Desk Research

Policy, framework and content

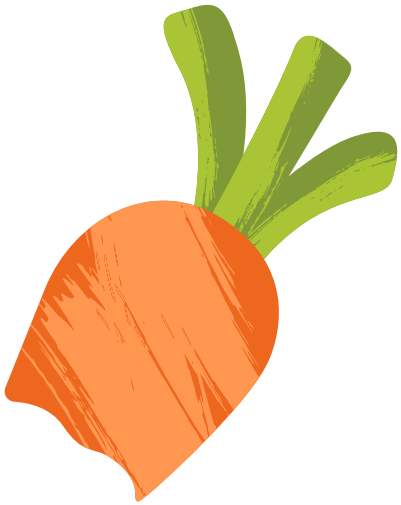
Italy is the first country in Europe to have introduced environmental education in schools in a consistent way throughout the education system. In secondary schools it is part of the scheduled teaching of Civic Education, a cross-curricular subject that includes knowledge and understanding of the social, economic, legal, civic and environmental structures and profiles of society. It is assessed as a subject in its own right. Within the dedicated classes, there is therefore space for environmental education, depending on the individual curricula developed in the different schools. However, it is evident that environmental education in itself, does not have the same importance as other subjects since the number of hours is very limited compared to the other disciplines.

According to the guidelines of the MASE (The Ministry of the Environment and Energy Security), teachers can choose a range of teaching paths and fact sheets to draw up a flexible curriculum, within the Civic Education classes.

In addition to the inclusion of environmental education in the Civic Education classes, many 'traditional' subjects (such as geography, mathematics and physics), are also studied from a perspective related to sustainable development. An 'update' of traditional subjects was made in 2020, in which the new aspects of ecological transition are included. The aim is to support the gradual inclusion of education for sustainable development in the education and training curricula, starting with the teaching of civic education and enhancing transversal skills and orientation pathways. Through this approach, and through the inclusion in Civic Education, environmental education is taught in a holistic and multidisciplinary manner, combining the scientific issues with social change.

Teaching methodologies

Environmental education content is delivered to students in a highly interactive manner. Teachers can take students out of school, to any natural or non-natural place, to do research, discover and observe the environment. All Italian schools can adopt and implement the 'Programme of environmental and sustainability education initiatives' drawn up by the Institute for Environmental Protection and Research. This document lists some of the educational initiatives in which schools can participate. These initiatives almost always involve meetings with experts followed by visits to places of interest by students and teachers.



The researchers reported that teachers are trained in interactive, problem-solving, 'learning by discovery' methodologies, and apply them to environmental education classes and projects. In addition, any supplementary materials can be freely used during lessons, whatever way the individual teacher chooses.

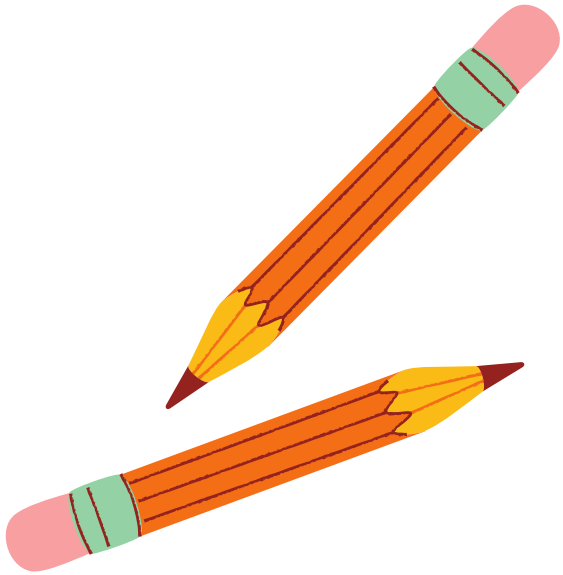
Analysis and interpretation

Although the current state of EE in Italy is rather good as compared to the other countries included in this project, there is no dedicated EE subject on the curriculum and there is a lack of public funds to implement practical teaching activities. The roots of these weaker areas or gaps are due to prejudices linked to educational traditions that make modernising the school system difficult and the lack of importance given at schools on the topic of the environment.

However, despite some resistance to EE in schools, a very positive step has been taken on a national level. In June 2022, the Ministry of Education developed the 'ReGeneration School' plan. It is the National Plan for the ecological and cultural transition of schools. The plan aims, while respecting full school autonomy, to accelerate and facilitate environmental education activities and learning towards new living models. This step forward by the ministry is crucial in order to learn how to combine established school practices with the new vision outlined and to channel learning content towards ecological empowerment.

Interviews with educators

The teachers interviewed were all extremely interested in the topic and willingly shared their knowledge and experience. All interviewees stated the importance of environmental education and how essential it is to be able to tackle climate change and the many environmental problems the world is facing, and that in order to bring about environmental change, a profound change of mentality is required, and this necessitates effective education on a wide scale.



They stated that biodiversity, energy sustainability, environmental quality and climate change must become part of all subjects and classes, rather than being introduced as seemingly isolated topics, phenomena and situations belonging to different fields of knowledge. They specified that only through an education system capable of linking the educational experience with the rest of society (and social / government institutions) can behaviour change be effectively undertaken. The interviewees expressed that because environmental education involves a wide variety of disciplines and has the aim of not simply 'transferring knowledge' but rather, strives to change habits, it should therefore be integrated into classes across the curriculum rather than taught as a separate subject. They felt that aspects of EE should be approached through classes on geography, sociology / civics, psychology, chemistry, biology etc, as EE should not be encapsulated in a single discipline, but must be approached holistically, intra and transdisciplinary.

They reported that, unfortunately, the dissemination of sustainability issues from the context of school and educational institutions to the public is failing to take place at the national level. They felt that EE should be approached as a path of emotional and cultural exploration and acquisition of awareness of sustainability issues, through the promotion of integral human wellbeing, linked to protection of the environment and collective responsibility.

In recent years, there has been a change towards greater school autonomy, and this firstly, gives teachers and schools more choice about what to teach, and secondly lays the foundations for schools to work with local municipalities, local groups etc to engage in education through practical projects.

Interviewees also stated that the school should take on a stronger role as a promoter of culture and relations, and provide students, families and the community with the tools necessary to communicate and implement habit change around environmental issues. They felt strongly that only through schools taking an initiative on this, and working with the community and institutions outside of the education system, can things change.

From the exchange of opinions that arose between the various teachers, a concept not proposed by the interviewer emerged from a number of the respondents: that environmental education must be an interdisciplinary subject. Interviewees stated that the subject needs to be looked at from a wide range of angles (global and local, scientifically and emotionally, national and international perspectives, the social, economic and natural aspects etc) holistically.

3.6 Turkey

Desk Research

Policy, framework and content

Activities related to education in Turkey are all carried out centrally by the Ministry of National Education. The curriculum as well as the methods of teaching and the materials are all determined by the Ministry alone.

The General Directorate of Secondary Education of the Turkish Ministry of National Education continues to study the implementation of environmental education at secondary level. They plan to develop environmental topics within the current biology, geography and philosophy courses. It is important to note that this environmental curriculum will not only 'deliver' knowledge but will also aim to encourage specific action. The objective is to support students in identifying natural resources near them, and be capable of consciously working with them within the framework of the new curriculum.

At the time of writing, there is, however, no elective or compulsory course in Turkish schools specifically on environmental education.

Nevertheless, in classes on Life Science, Social Studies, Geography, Science/Science and Technology, Biology, Health Science and Chemistry courses, there is some evidence of inclusion of environmental issues into the topics. There is not necessarily any interdisciplinary work to connect the social and scientific aspects of environmental issues however. Climate and climate change issues are taught in the 5th, 6th and 7th grades in the Social Studies course, and in the 5th, 6th, 7th and 8th grade Science and Technology course in accordance with climate change education, with an interdisciplinary approach at the secondary school level.

In the geography course curriculum, students learn about natural disasters and are encouraged to develop solutions / applications for protection and taking precautions by evaluating natural disasters and environmental problems. In the Science/Science and Technology course curriculum, students are encouraged to to understand the interactions between science, technology, society and the environment.

Organic Waste Management specifically, is included in the Biology curriculum of 10th Grades, which includes issues of composting, carbon footprint, climate change, waste separation, recycling household organic waste and oil, collection of rainwater, renewable energy sources, etc.

In the Life Studies course curriculum, the focus is on students gaining the ability to develop environmental awareness and use the resources in the environment effectively. In addition, it aims to help students develop the ability to gain knowledge about natural disasters and to protect themselves from them.
In the Social Studies curriculum, students explore ideas about the the place they live in, question the role they play in the place they live, and at the same time comprehend the importance of being sensitive to the environment, the importance of their environment and the importance of protecting the environment not only for themselves but also for the society and future life. It further aims to encourage students to participate in the process of solving environmental problems.

In December 2021, the Ministry of National Education took an important step to allocate more space to the environmental education and climate change course in the curriculum. With Turkey becoming a party to the Paris Agreement, a significant change was made in the curriculum in order to raise awareness of our young generations for the fight against climate change. It was decided that a class on 'environmental education and climate change' will be taught for 1 hour in the 6th and 7th grades and 1 or 2 hours in the 8th grades, starting in the 2022-2023 academic year.

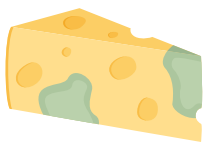
Teaching methodologies

Education in Turkey is generally oriented towards raising individuals that have knowledge, consciousness and good behaviours towards the environment. Inclusion of environmental issues into the curriculum, or supporting students to carry out extracurricular environmental activities could be ways of giving environmental education.

With regard to teacher training programmes, it is clear that science teachers do not have enough input about EE in terms of both content and also teaching methods. However, in- service EE seminar programmes for all teachers are being conducted by the Ministry of National Education.

Within the framework of the seminar program, ecology, ecosystem and environmental problems are discussed, and teachers are trained to create awareness, knowledge, attitudes and skills in students for an effective EE.

In terms of materials, books are provided by the Ministry of Education and supplementary materials can be used with the permission of a school's head teacher.



Analysis and interpretation

The data suggest that teachers are the key drivers of incorporating certain aspects of EE in school curricula. Basic education should include compulsory EE and relate it to the life needs and aspirations of the students. It is important that we capture this enthusiasm and that no opportunity is lost to develop knowledge, understanding and concern for the environment through school education.

The curricular and cross-curricular attempt of EE also should be a joy for the learner, arouse pupils' awareness and curiosity about the environment and encourage active participation in resolving environmental problems. EE is closely linked to the other cross curricular themes of other subject areas.

Within the broader framework of environmental change and progress, it is important to note that EE in Turkey is at a nascent stage of development, and aims to improve the environmental literacy of the individuals. The general Directorate of Secondary Education of the Turkish Ministry of National Education continues to study the implementation of environmental education and there are several ongoing efforts to increase environmental awareness in the country, in particular, due to EU Accession requirements.

Interviews with educators

From the interviews carried out in Turkey, the overall feeling among the respondents (teachers in general secondary schools) was that although teachers are familiar with the subject of environmental education, they struggle to integrate into the curriculum as there is no specific class for EE. They also agreed that teachers need to be trained on how to introduce and integrate the topic into their classes, but that in order to do this, trainers need to be trained. All of the respondents stated clearly that environmental change requires that teachers work on EE with children in schools.

Respondents indicated that climate change is included in the curricula of various courses, but there is a need for a more creative and practical approach and methodologies (rather than simply theoretical) in terms of raising awareness and improving environmental ethics which lead to behaviour change.

They stated clearly that there is a lack of training on EE, during their teacher-training, and that there is also a general lack of time and funds for teachers to engage students in EE, in nature (that is, hands-on experiential education and outdoor activities).

Every year, municipalities engage in some form of EE with schools (so there is some manner of 'joined up' work between government institutions) and there are also environmental themed competitions for schools, run by municipalities which many schools participate in. However, most schools do not have a proper yearly activity plan on EE or a consistent approach to addressing it throughout the curriculum, throughout the year.

Although some teachers pointed to some positive aspects of recent developments in EE, in particular in agricultural education and with the addition of an 'eco-delegate' in general schools, many felt strongly that EE is insufficiently addressed or it is piecemeal (such as a one-week project, rather than integrated into classes consistently).

One respondent raised the issue of the lack of consistency between the education system and society and parental behaviour and knowledge, stating that even when there is EE in schools, this doesn't necessarily lead to change, because parents are not modelling this behaviour in homes and in general, in society, people are not engaging in correct waste management behaviour. Therefore, children may learn something in theory in schools, but not 'translate' that into behaviour because they don't see anyone else engaging in it.

It is very interesting to note that many of the respondents felt that their knowledge of EE is sufficient but that they lack a 'roadmap' to take action and find a way to bring it into the classroom. Nearly all of the respondents expressed that they need support in how to help students to be climate literate, but also mentioned that the initiative to do so will have to come from individual teachers, (that is, working bottom-up) and relies on each teacher's willingness to get involved in EE.

It was stated as an obvious point, that without sufficient training, it is sometimes difficult to propose interesting activities for the pupils. Therefore, even though most stated that they are confident in their knowledge about EE, they also expressed that they lack the skills to engage their classes in a relevant, interesting and effective way.

Some of the respondents proposed that 'thematic weeks' on EE could be initiatives, but this requires an additional investment for the teachers. Most favoured a consistent and cohesive approach to EE in a cross-curricular manner (that is, integrated into a range of already existing subjects).

With regard to the current approach to EE in the Turkish school system, the teachers agreed unanimously about the importance of EE as a central and obligatory part of the curriculum. It was pointed out that environmental education is increasingly present in agricultural education and that although this is very positive, it is not as evident in the general secondary school system.

Respondents remarked that there are also 'eco-schools' in Turkey in which EE is one of the central axes of education, in which environmental issues are cross-cutting themes, at all ages and in all classes, regardless of the subject, and also pervades the practical behaviours and systems of the school itself. These schools, however, are not mainstream secondary schools.

3.7 Romania

Desk Research

Policy, framework and content

Environmental studies and environmental education are integrated into the school curriculum in Romania as part of other subjects, but are not always treated with the same importance as other subjects. Environmental education is usually included as part of the curriculum for subjects such as biology, geography or natural sciences, depending on the educational level. There is no specific class dedicated exclusively to environmental or ecological issues. This means that teachers are encouraged to address environmental and ecological issues within these subjects. In recent years, efforts have been made to increase the importance and visibility of environmental education in Romanian schools, especially by promoting projects and experiential learning initiatives. However, it does not seem to be a priority subject.

In addition to this, high school education also includes a transdisciplinary module called 'Environmental Education', which aims to develop students' knowledge and skills in the field of environmental protection and sustainable development. This module can be integrated into various subjects and is not a separate class in itself. This interdisciplinary approach ensures that environmental issues are addressed within a broader context and in relation to various themes and concepts within other disciplines. However, this integration may also lead to a lower visibility of environmental topics compared to a class dedicated to environmental studies. Moreover, its implementation depends largely on teachers' decisions and their willingness to engage in environmental activities and projects.

Although biology, geography and natural sciences are subjects in which environmental issues are frequently addressed, these topics can also be integrated into other subjects, such as social studies or humanities, to engage students in issues about the impact of human activities and decisions, as well as the roles of society, politics and government in managing environmental problems. In this way, these issues can be addressed in a more interdisciplinary way and can be linked to the social, economic and cultural context.

Where environmental issues are not sufficiently addressed in the classroom, clubs and extracurricular activities can provide additional opportunities to explore these topics, while there are many relevant non-formal education programmes and initiatives run by NGOs and other organisations.

Teaching methodologies

Teaching methodologies for environmental and ecological education can vary depending on the teacher, institution and educational level. In general, teachers are encouraged to use interactive, practical learning methods and to stimulate discussions about the relationship between facts and behaviours. Modern pedagogical approaches in environmental education tend to promote experiential learning and focus on real environmental issues.

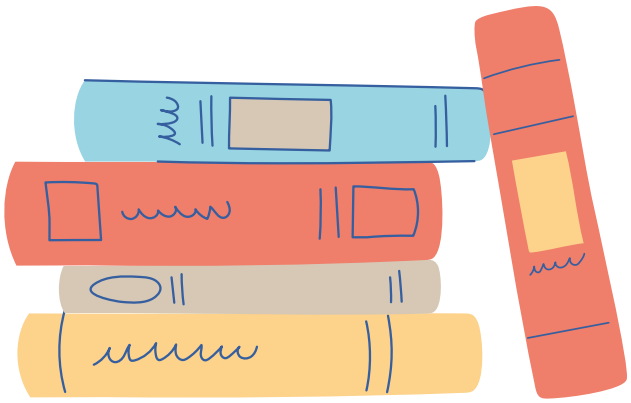
Teachers can take their students out of school and into the environment to investigate, discover and observe. Such activities can contribute to a deeper and more relevant understanding of environmental issues and develop practical skills as well as a responsible attitude towards the environment. However, it is important to note that the implementation of these methods and activities depends largely on the initiative and motivation of teachers, as well as on the resources and support available in educational institutions.

A programme called ‘School Differently’ aims to provide students with alternative and non-formal learning opportunities, different from the traditional methods used in the regular classroom. It can include activities that focus on environmental and ecological themes, such as visits to recycling centres, greening projects, observing the environment and participating in workshops and presentations on environmental protection. However, it is not compulsory.

In general, in teacher training courses, teachers are encouraged to use student-centred methodologies that promote critical thinking, problem solving, teamwork and creative expression. However, the degree to which teachers apply these methods in practice may vary depending on their experience, pedagogical beliefs and the resources available in educational institutions.

In general, teachers are free to choose and use additional materials in their lessons, as long as they are relevant and in line with the objectives and content of the curricula set by the Romanian Ministry of National Education. This freedom allows teachers to adapt their methods and materials to the specific needs and interests of their students and to ensure that the information presented is up-to-date and in line with recent developments in environmental education.

Analysis and interpretation



Areas in which EE is successfully implemented include the integration of environmental topics into various disciplines to address the issues in an interdisciplinary way, initiatives such as 'School Differently’ and training programmes for teachers to develop skills in teaching environmental issues.

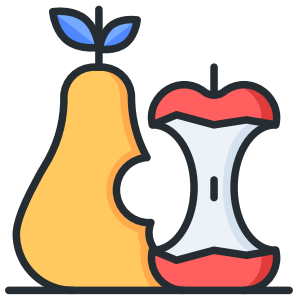
Whereas weaker areas include the lack of a specific and mandatory class on environmental studies and the variability in the implementation of learner-centred methodologies and innovative approaches in environmental education, which depend on teachers' experience and skills.

Educational change can be initiated both 'top-down' (through reforms and regulations by the Ministry of Education) and 'bottom-up' (through initiatives by teachers, local officials and school communities). Both approaches can contribute to improving environmental education in Romania. Improving teacher training and promoting effective pedagogical methods in environmental education can encourage change and sustainable development in the education system.

The causes and reasons behind the current situation include; limited priorities and resources in the education system, resistance to change, lack of coordination and cooperation between different stakeholders, insufficient resources and the heavy content load of the curriculum. In addition, outside of the education system itself, there is little public awareness of the importance of environmental issues and this leads to a lack of public pressure or movement on education ministries / school systems to engage in EE.

It is also important to note that there is a large urban/rural divide in terms of access to services, which includes high quality education and this has an impact on rural students' involvement and engagement in EE, if it is offered as an extracurricular activity only.

Interviews with educators



Respondents expressed clearly and unequivocally that the state of environmental education in Romania is not very well developed, and this is why most of them were very sceptical about the research and were hesitant in their responses.

All of the respondents showed that they are acutely aware of the need for EE, but seemed to be very disappointed with regard to how it is implemented.

It is important to note that there are huge discrepancies in Romania (in social and economic terms and also with regard to government facilities and waste management) between rural and urban areas. Urban areas tend to be much more modern, better organised, better engineered and with a generally better provision of education, higher incomes and better waste management systems. Rural areas tend to be very underserved in terms of waste collection and other services.

Many interviewees informed us that there are a variety of school organisations and 'other groups' (NGOs, non formal associations) who do a lot of work on EE, but many lack resources and also may have no formal 'standing' to work with schools directly.

Most respondents stated that they personally do their best to develop proper, active behaviour change with their pupils and try to involve them in various hands-on activities, but it is very difficult to do so, when there is no correct waste management by the institutions / government departments as a role model and good example. In addition, respondents stressed that they do not feel like they have the knowledge and resources to be able to engage properly in EE with their pupils and it was also noted many times that they did not feel that Romanian society is 'ready' to engage in the behaviour change. This means that even if the EE is effective, pupils will not see good examples of proper waste management in society in practice, and this may be demoralising or demotivating.

The general conclusion of the interviews is that there are many problems around EE in Romania, which are due to a lack of resources and information, and also disappointment in the educational system in general.

It is significant to note that most of the respondents felt that the status of EE in Romania is either in its infancy, or very weak, and some expressed that they felt that EE is not even addressed in Romania at all. Although some respondents stated that things are developing, these same respondents did not feel very confident about its development (in contrast to their optimism about the potential for groups (NGOs, informal groups to make some kind of difference or initiate EE in an informal manner).

The respondents stated that the most significant needs and challenges with regard to EE in Romania are: the lack of education (for both teachers and students) and materials provided by educational officials, and also the lack of proper waste management in their cities / towns in general, so that even when children do have some EE input in schools, they do not see examples of good environmental practice in their neighbourhoods (and are therefore much less likely to adopt good waste behaviours).

Some mentioned that environmental issues have been introduced in some schools, but they are not part of an obligatory curriculum. They all consider it essential that it should be obligatory to include EE in schools, and that this is done in a practical manner. Moreover, they point to the importance of including parents in this education. They felt it is vital that the parents are taught good waste management practices and that they apply these in the home, so that the EE information taught in schools is practised and therefore reinforced as a habit, in the home.

With regard to the factors that have an influence on, or affect the progress and the development of environmental education in Romania, the respondents pointed to the lack of information and materials, and the poor quality of financial resources as the main issues. In addition, many mentioned social mentality and emphasised that EE in schools must be accompanied by public EE for parents and citizens, in order to have an effect.

Many respondents expressed that environmental behaviour change requires not only EE in schools, but also cooperation and integration with the municipality, local institutions, government policy etc, in order for change to be brought about. They seemed a bit disappointed with the focus on teachers and schools and considered that these issues need to be addressed at a higher level and in a 'joined up' manner.

The most important thing to be noted is that they consider that environmental issues need to be approached at a national level across ministries and put into practice by municipalities, and to have more investment and relevant information about it.

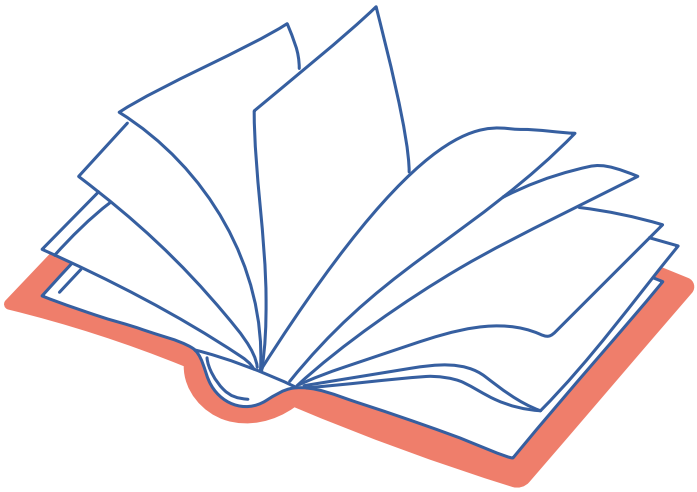
3.8 Conclusions

None of the countries' education systems provide EE as a separate class, but some of them have dedicated subjects on broader civic issues, which involve EE as an obligatory aspect. Most countries integrate aspects of EE across the curriculum, but the manner in which this is carried out varies. Most countries indicate that where environmental issues are included in other subjects (biology, geography etc), it is often without linking the theoretical issues to the practical local situation, and there is often no scope for multi-disciplinary approaches, or linking the scientific facts to human behaviour. Italy and Spain's approaches, together with Slovenia's class on 'Household' however, attempt to clearly connect the social aspects of environmental issues to the scientific ones.

An additional commonality throughout all of the countries is that the amount of time given to EE tends to lessen as children get older, with primary (elementary) schools providing more education 'in' nature and hands-on activities than middle schools and high schools (with the exception being specialised agricultural high schools in Slovenia). Also, EE is still not afforded the same importance as other subjects. The 'traditional' subjects that will be required for exams, university entrance and professional progress are given many more hours of class time and are regarded as more 'valuable' than EE.

Additionally, the approach by Ministries of Education towards the manner in which EE is implemented in all of the responding countries is to leave it up to each teacher to work on EE issues with whatever methodology /activities they choose. On the one hand, this is a positive finding, as it demonstrates that teachers are given the freedom to engage learners in a wide variety of creative, practical ways and that they are trusted to have the skills and knowledge to do so, without supervision or prescriptive methods. However, on the other hand, it could indicate a lack of interest by the Ministry and an attitude of not giving the topic any significance. The latter is problematic, as it means that many teachers who wish to implement EE may not have the training, skills or resources to undertake it in fun, creative, formative and useful ways. This will result in varying levels of quality of the EE experience by children.

Finally, many educators mentioned the role of the family and household practices in reinforcing or undermining ecological behaviours, and stated that for EE to be effective, parents and families must be part of the learning and behaviour change process too.



4. Analysis

The initial hypothesis behind both the project and the report was that there is a direct correlation between the level of education, citizen behaviour and waste management; in countries where environmental education is present, citizens demonstrate more ecologically sound behaviour which leads to proper (organic) waste management. The findings from the research presented in the sections above show that there are indeed links to be drawn between the state of environmental education, the behaviour of citizens and the state of organic waste management.

Some countries (Slovenia, Spain, Italy) have very strong official frameworks for EE in schools, others (Romania, Greece) have some manner of attempts to include EE in schools, but the systems are not necessarily robust, whereas Turkey has a clear plan (but it has not been implemented yet) to introduce EE in an integrated way. Countries that present a higher level of education, both at a theoretical level (i.e. found in the literature review) and a practical one (as reported by the educators), exhibit better behaviours towards waste management and issues around organic waste. Spain, Italy and Slovenia are such examples.

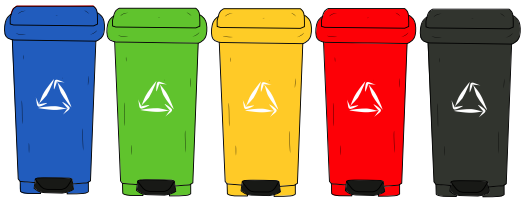
The Spanish curriculum includes a compulsory subject featuring a section on sustainable development and environmental ethics, while Spain demonstrates higher levels of separate collection of organic waste as compared to the other countries included in the research, with 50% of the survey respondents separating their organic waste.

Italy has integrated environmental education within its national curriculum, and reports the highest rate of organic waste separation among the 6 countries and an overall higher awareness levels on environmental issues. Nevertheless, it also reports the lowest rate of reuse with only 56% of respondents reusing items regularly, and, while 96% of respondents separate their organic waste at source, only 24% report a good awareness of the local organic waste management systems. This suggests that the awareness is limited to specific themes and does not run though all aspects of ecological behaviour within daily life. Therefore, there is still quite a lot of room for awareness raising.

With a dedicated 'Learning for the Environment' class in the more formative years of education, more than half (55%) of the Slovenian sample surveyed - the highest reported level of knowledge - have good awareness of the organic waste management systems in place in their towns, while Slovenia is one of the leading examples in the EU for its organic waste management system, that recycles up to 66% of organic MSW. Slovenia also imposes fines for non-compliance, which might also be one reason behind its good performance. This suggests that there is no causation proven between the state of environmental education and that of organic waste management and relevant citizen behaviour.

On the other hand, countries with minimal to no formal environmental education - such as Greece, Romania and Turkey - present lower levels in waste management statistics, and subsequently in citizen behaviour in terms of organic waste separation. However, although there seems to be a clear correlation between the status of environmental education and the status of waste management, there is no clear correlation to be drawn between the education and the awareness of citizens.

In fact, Slovenia's average level of knowledge regarding the potential for reuse/repurpose of organic waste is 3.55/5 and its level of awareness regarding the management of organic waste that takes place in your town/city is 3.45/5. These are the highest reported levels as compared to the rest of the countries, with Slovenia reporting the highest levels of separation of organic waste, as well as the most comprehensive environmental education within the national curriculum. However, although Italy is a good example in terms of both environmental education and organic waste separation, it reports the second lowest average level of knowledge regarding organic waste utilisation (3.12/5) and the second lowest level of awareness about local organic waste management practices (2.88/5).



The diagram below (Diagram 17) shows that there is no direct correlation between any formal environmental education and the awareness of citizens regarding the organic waste management that takes place in their towns.

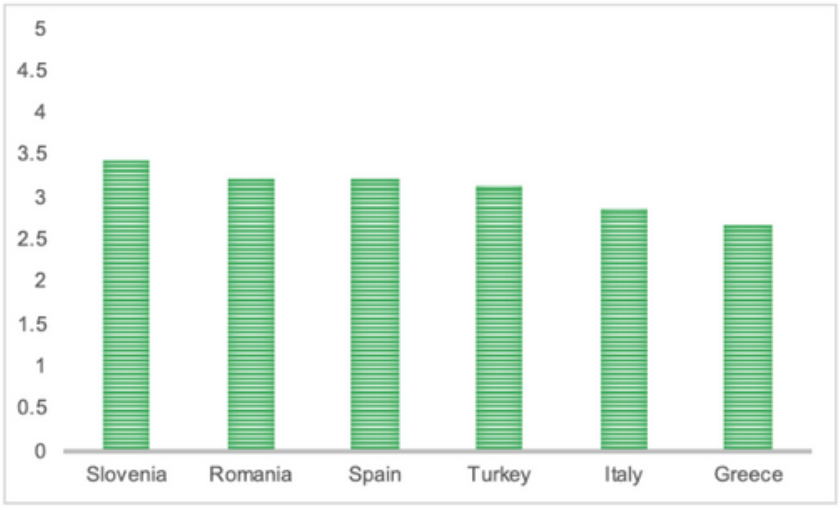


Diagram 17: Level of awareness regarding local organic waste management practices per country

The graph below (Diagram 18) shows that there is not necessarily a link between any formal environmental education and the level of knowledge regarding the potential for reuse/repurpose of organic waste.

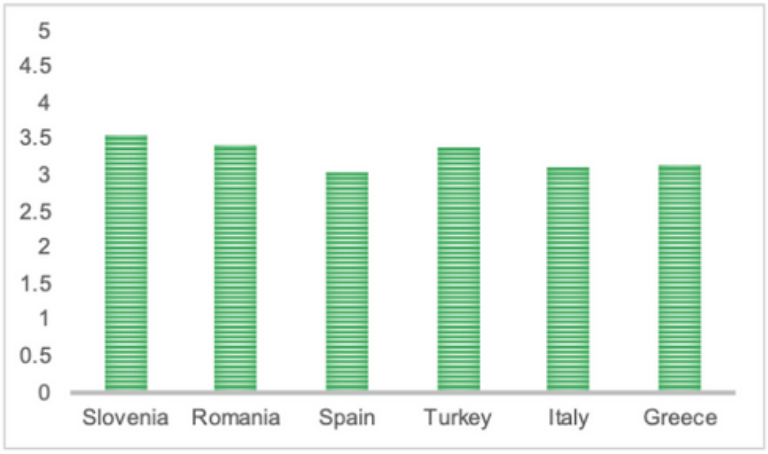
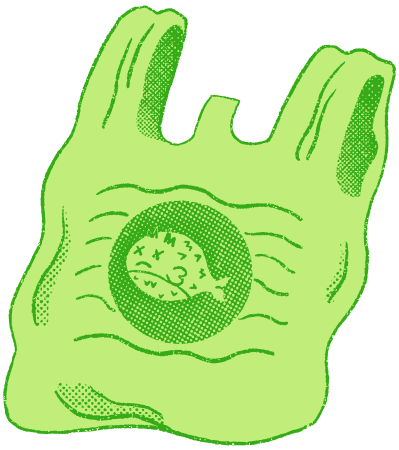


Diagram 18: Level of knowledge regarding the potential for reuse/repurpose of organic waste per country



It should be noted that it could also be the case that the sample surveyed did not themselves receive the environmental education described above as they are fairly newly introduced in the national education systems, which could present another limitation to the analysis of the findings.

In fact, of the whole survey sample, only 28% (43 out of 155 respondents) received any information / classes / activities about organic waste handling at school. Of those, only 10 respondents did so through an environmental / ecological studies class, i.e. only 6% of the whole sample had the opportunity to attend a class devoted to EE, and they come from all 6 countries of the project. As such, there is no specific data in this research that can shine a clear light on the relationship between receiving compulsory education that is devoted to environmental issues and exhibiting ecologically sound behaviour later on. However, there are interesting findings when comparing those who did receive EE at school and those who didn't.

Between those who did receive EE at school in any form, the average level of knowledge regarding the potential for organic waste reuse is 3.47/5, which is slightly higher than of those who did not receive any education which is 3.89/5 on average. Similarly, the average level of awareness regarding the local organic waste management system is 3.42/5 compared to 2.88/5. The average level of care about environmental issues is 3.95/5, compared to a 3.89/5 average for those who did not receive any EE. And the level of care about the proper management of waste is 3.97/5, compared to a 3.82/5. The graph below (Diagram 19) demonstrates the average levels of care, knowledge and awareness of those who did receive EE themselves and those who did not.

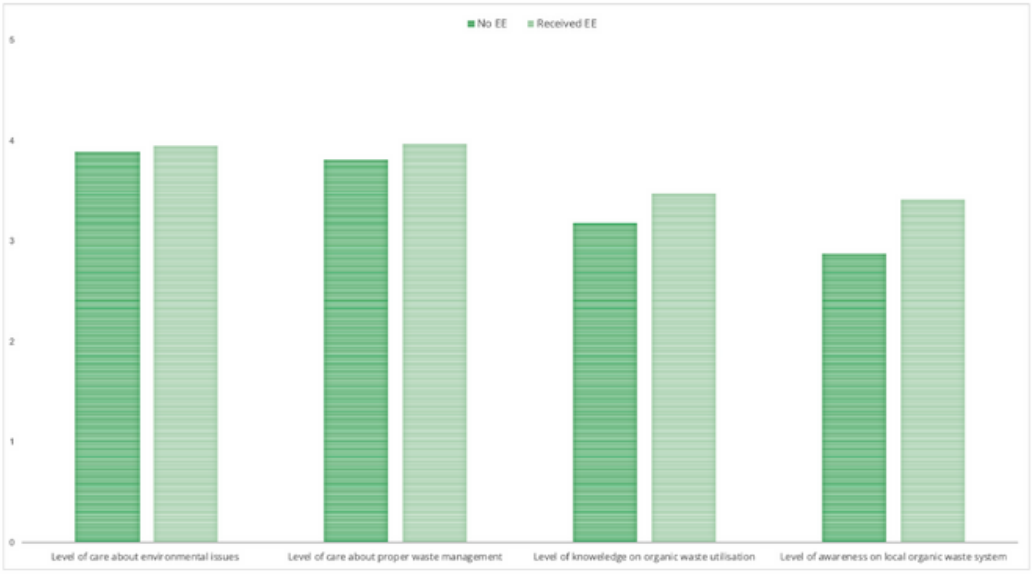


Diagram 19: Comparative levels of care and knowledge between those who did and those who did not receive EE

The graph clearly shows that the average levels of care and knowledge among those with any EE are higher, albeit only slightly, than of those who did not receive any relevant education at school. When it comes to organic waste specifically, the increase in knowledge and awareness reaches 9-19%, i.e. those who did receive environmental education at school are on average 14% more aware of issues related to organic waste.

Furthermore, in terms of practical day-to-day habits that could be indicative of a citizen's environmental behaviour is that of reusing/repurposing items. Survey respondents were asked whether they reuse items regularly and the findings seem to be irrelevant to any environmental education or organic waste separation. Specifically, Greece - with its very minimal EE and the lowest levels of awareness on organic waste management - presents the highest rate of reusing, with 98% of respondents reporting that they do reuse. At the same time, in Slovenia - where there is a very comprehensive EE and one of the best organic waste management systems in the EU - only 80% of respondents reuse items. Diagram 20 presents the % of respondents per country who reuse items at home regularly.

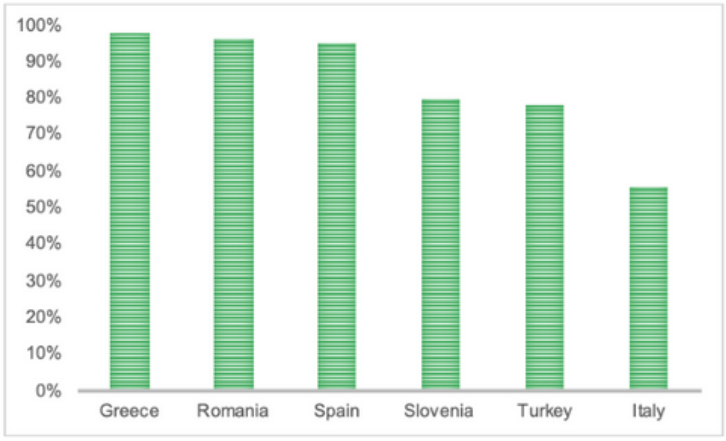


Diagram 20: % of respondents who reuse/repurpose items regularly per country

Although the sample respondents are active in terms of ecological practices that are not related to provisions from local authorities (such as reusing and repurposing items at home), they are not equally aware or informed about organic waste. A key finding from the research is that almost all participants were willing to learn more (85%) and to engage in proper organic waste management (94%) if given the knowledge, tools and opportunity. This could indicate that governmental bodies are not providing their citizens the appropriate information, tools and infrastructure to engage in the proper separation of their organic waste. Specifically, of the respondents who do not separate their organic waste, 75% report that there is no organic waste collection in their town and/or no information given to them on how to separate their organic waste. Of the 10 respondents who would not be motivated to engage in organic waste separation, 7 report it is because they do not trust the relevant authorities to handle the waste properly.

Another reason that needs to be taken into account that impacts citizen behaviour but also their desire to engage in ecologically sound behaviours, is the lack of demonstration of enforcing environmental rules by the State. For instance, Greek educators frequently mentioned that images of sewage leaks / effluence and the lack of proper recycling by both the public and the authorities are deterrents for proper citizen behaviour and create a negative model for young people who may initially be inclined to act with an environmental conscience, but are demotivated when they see that the government is either not enacting legislation to protect the environment, or when it does, doesn't enforce it. At the same time, many respondents raised the issue of a lack of good public education by municipalities / authorities about EE issues (e.g. how to use the brown bins, how to recycle etc) as the reason behind improper behaviours.

Concerning specifically the desk research on the state of environmental education, while the findings differ greatly between the countries and EE is implemented in a range of different ways, as has been described above, there are a number of common themes across the countries. The systems and approaches differ greatly from country to country in terms of the content of EE, educational policy, attempts at 'joined up' government policy (that is, consistent implementation of sound ecological policies and initiatives for public engagement in proper waste management), teaching methodologies and support for teachers.

In Slovenia, in particular, the commitment to EE is supported very effectively by its wider ecological policies, enforcement of environmental standards and public education about waste management behaviours, which have created a broad culture of collective and individual responsibility. This wider visible public and governmental practice of good environmental behaviour (which is reportedly working efficiently in Slovenia) was identified by more than one country's research as essential to supporting and reinforcing EE in schools. Without 'joined up' public policy giving children the opportunity to experience and see good ecological behaviours on a daily basis by local and central governments and the public, it is very difficult to encourage and instil behaviour change, or make the link between the theoretical aspects of EE and daily life.

Nevertheless, the overarching problem voiced by the educators is that environmental education is simply not regarded as important and its practice is not valued, while they do not feel properly supported in engaging students in the topic, even in countries with a central commitment of Ministries to EE. The reasons behind this is that curricula are already too full with obligatory classes, the syllabi are often so dense that even if a teacher wished to include some environmental issues there would be no time to address it effectively, and students - already overburdened with school work- would not engage with additional ideas that are not essential for exams. Educators also pointed to a lack of training (both in terms of content and methodology) provided to teachers around EE.

Beyond the issue of education in schools, an interesting issue identified as a problem in engaging in environmental education and in ecologically sound behaviours, is the lack of 'joined-up' policy, which undermines educators' efforts to interest children in ecological behaviour. For example, even when EE is mandated via a Ministry of Education, there are often no good examples of environmental management in practice on a local or national level. Children therefore learn about habit change and good ecological behaviour, but don't see any of the official state bodies enacting and enforcing good ecological practice. All of these findings present important inputs for both the educational and policy recommendations listed below.

In all, there are limitations to the analysis of the findings and although there is correlation there might not be causation between the elements analysed. However, the research clearly shows a need for more awareness raising activities, with up to 60% of respondents not having good knowledge around organic waste management. Findings such as that 66% of respondents report a high level of care regarding the proper management of waste, that 85% would be interested in learning more about organic waste reduction and that 94% would be motivated to engage in organic waste reduction at home, if it were easy to do so, suggest that the desire to engage in the more circular management of organic waste from the part of the citizens is in place. Therefore, more actions need to be taken to inform these citizens while authorities also need to update their waste management systems to reflect the desire from residents with regulatory and policy support from national governments.

5. Recommendations

The recommendations presented in this section reflect the findings from the research carried out and the conclusions reached. On the one hand, education needs to be provided more widely in line with the desire of the citizens to learn and of the educators to incorporate it in their classrooms. As such, this section will recommend elements that should be included in the teacher training materials for environmental education that will be produced through this project. On the other hand, policy needs to be updated to reflect both the pressing need to manage organic waste properly and the readiness of residents to engage in it. Recommendations for policy change will be discussed below.

5.1 Educational Material

Drawing from the issues addressed and described by all of the partners, based on their country's systems and experiences, and the participants to the surveys and the interviews, a set of recommendations has been compiled with regard to the common areas for improvement of environmental education in general, and more specifically, what materials teachers need in order to engage students in organic waste education, and how teachers can be supported in doing so.

Ideally there needs to be a class specifically for environmental education that includes teaching on the circular economy, its values and practices and more specifically information on how the students and the citizens can incorporate it in their daily lives. However, if this is not possible within the school curriculum, the issues of EE should be addressed in a multi-disciplinary manner (linking biology, geography, agriculture, psychology, civic values and personal and social education), which requires not only cross-curricular coordination, but also cooperation between teachers within a school. All partners unanimously and unequivocally recommend that EE is given more recognition as a subject of importance and that teachers involved in EE should be supported better by school systems, with a greater input of time, training and resources.

More specifically, teaching materials for environmental education on organic waste management need to include:

- Detailed information on the life cycle of organic waste, from generation and collection to prevention of generation, recovery through composting or biomethanisation and use of the resulting products in agriculture or energy. This should also include the impact of organic waste on the environment and the importance of its proper management.
- The negative impact of organic waste on the environment and human health, such as soil, water and air pollution, the emission of greenhouse gases (with emphasis on methane) and risks to public health, is highlighted. This includes material on organic waste management, among other things.
- Ideas and supporting guidance on creating organic waste reduction and reuse systems with students in the classroom and school in practice (e.g. composting, gardening, separate waste containers in the cafeteria).

- Information about household waste management for students to practise at home, and advice / suggestions on how to engage parents in this habit change
- Suggestions on how to connect the knowledge that students will have already gained about EE in general (probably in a piecemeal manner), via biology, geography and chemistry classes, with practical issues of organic waste in practice, and link this to behavioural change and good citizenship.

In terms of pedagogical methodologies, teacher training materials need to include:

- Lesson plans that guide the teachers, step by step, in carrying out participative, learner-centred activities. These need to be practised in teacher training sessions as role-plays, not simply 'telling the teachers' about them. Therefore, any materials need to be accompanied by training workshops.
- Introducing learner-centred methodologies requires supporting the teachers in gaining the confidence to 'relinquish some control' over their class, and this takes guided practice.
- Step by step guidelines to create participative activities in the class around the relevant issues of organic waste.
- Sets of participative, critical thinking, cooperative games / activities (5-10 minutes long) that a teacher can use at the start of any class. The purpose of this is to enable the teacher to introduce the new methods to their classes and allow both the teacher and the students to gain confidence and enjoy the new approaches and prepare the students for the manner in which the organic waste lesson material will be handled, prior to engaging with the specific content.

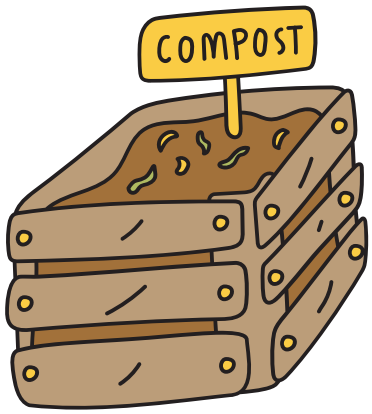
- Step-by-step instructions on how to actively involve students in the learning process, through practical activities, debates, projects, and teamwork that engage them in organic waste management and provide opportunities to apply in practise the knowledge and skills acquired in environmental education.
- Ways to encourage teachers to design their own teaching-learning sequences that facilitate meaningful learning by both students and teachers, through the relevant cultural frameworks of each country / region.
- More (and more innovative) use needs to be made of digital technologies and the capacity for gamification of environmental education, the real-time involvement of students in citizen science projects that might involve uploading data to wider projects, and also communication and shared projects across geographical regions and countries.

5.2 Policy

Based on the results, findings and suggestions of each partner, arrived at through the four pieces of research undertaken, the following recommendations for policy change have been identified:

First and foremost, it has been unanimously stated that EE needs to be given greater priority as a core subject in schools which can only be achieved by providing teachers with training, materials, greater resources and creating time in the curriculum to dedicate to it.

Environmental education in schools needs to be backed up with policy and system changes in energy policy, environmental management (national and local levels) and waste management and the visible enforcement of such. This is essential in order to create a social framework and cultural norm of caring for the environment in practice, through behaviour change. Without this 'real world' model of good environmental practice, any EE in schools is at a high risk of being completely undermined. In a similar vein, public education (via public service announcements, attractive branding, visible separate waste bins, engaging businesses in the visible practice of waste separation etc) is essential to reinforce the education that children receive in schools, and encourage good habits. Therefore, policy change requires 'joined up' government, between ministries, local government and local systems of enforcement, together with effective public outreach.



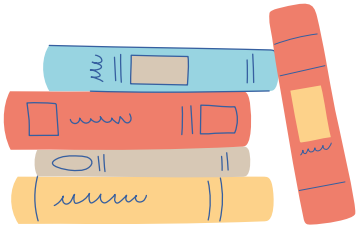
Environmental education must be provided in schools as a compulsory part of the curriculum. It must be approached and implemented in a consistent, age-relevant and practical manner, linking theory and practice and ensuring that it is included in the curriculum as either a dedicated subject, or in a coordinated and multi-disciplinary manner across subjects, without a reduction in its hours as children get older.

EE in terms of content must be included in teacher training in Departments of Education at Universities either as a separate subject, or integrated into subject-specific teacher training. In either case, it is vital that the broader social, cultural and political spheres are included, to draw the links between environmental issues and human behaviour in nature and on the planet.

It is equally important that teachers are trained not only to gain knowledge proficiency, but also in experiential, 'learning by discovery', participative and critical thinking pedagogical methods. Without the pedagogical approaches that encourage thinking, experimentation, team work, debate and 'hands on' learning in nature, EE remains a theoretical subject that has a low potential for formative habit change. This essential aspect of EE (training teachers) requires that departments of Ministries of Education that deal with primary, middle and secondary schools, cooperate with the departments of tertiary education to ensure that teachers are confident and trained to teach with the materials for EE in schools, with relevant methodologies.

Furthermore, more 'joined up' policies and systems need to be put in place to encourage and provide the resources for teachers to make use of and cooperate with environmental centres, areas of natural importance and research institutes, as well as have the resources to organise trips to either study the environment in nature, or else to carry out research in place with eco-social problems and formulate ideas to solve them. Community-based environmental education needs to be encouraged, which includes not only students carrying out projects in the community, but also bringing the community (and students' families) into schools to learn and plan actions together. Thus, formal and 'informal' environmental education can take place together, which will support a culture of habit change within a neighbourhood. Such actions need to be supported by local/municipal and regional authorities as well as local environmental centres.

All of the above point to the recommendation that Ministries of Education should design and develop national curricula on environmental education for all school grades, that approach the topic holistically and through interactive methodologies with an emphasis on experiential education and critical thinking.



6. Conclusion

The initial hypothesis of the research undertaken was that there is a correlation (and potential causal relationship) between the provision of environmental education in schools, ecological behaviour of citizens, social norms, laws and policies (and their enforcement), and systems of waste management.

The research set out to explore these issues, identify possibly causality, highlight gaps in systems and offer a set of recommendations about how to address them, so that education can be utilised as a tool for large-scale and lasting change with regard to public behaviour around organic waste.

Our findings reveal sets of interconnected issues as co-determinants of outcomes, which are not necessarily clearly linear relationships of cause and effect, but rather, a complex interaction of factors both within the educational systems, as well as interplay with socio-economic issues, approaches to ecological rule enforcement, and environmental / energy policy.

Having noted the complexity of the issues, the findings seem to point to the fact that in countries where there are higher levels of environmental education, public behaviours towards waste management are better, and official systems of waste management are more effective. At the same time, the surveys reveal that those who do receive environmental education at school in any form exhibit higher levels of care and awareness towards environmental and waste management issues than those who did not receive any such education.

In addition, the research reveals unequivocally that educators feel strongly that the single most effective way to address public behaviour and bring about systemic change in waste management is through a robust programme of consistent EE in schools, throughout all of the compulsory years of education. This is reinforced by the finding that EE does correlate to better awareness and care.

This requires resource input (training teachers, supporting teachers, providing more materials and funding) and joined up policy making and implementation both within each Ministry of Education (e.g. to train teachers at the tertiary level in coordination with creating materials for primary and secondary schools), and coordination with Ministries of Energy, Environment etc. and local systems of municipal waste management. Without this holistic approach, it is impossible to create and sustain a culture of responsible environmental behaviour and support it to become the social norm.

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