GREEN BIO GUIDE

Cofinanțat de
Uniunea Europeană

RESPONSIBLE COMMUNITY

BUMIR

ΟΠΕΘ

Erasmus + project: " Together for a responsible community"

Project no. 2021-2-RO01-KA210-ADU-000048442

Partners

- BUMIR srl – Bucharest, Romania
- Organization for Promotion of European Issues (O.P.E,I.) – Paphos, Cyprus

This project (project no. 2021-2-RO01-KA210-ADU-000048442) was funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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ABSTRACT:

Earth is our home. A friendly home because it gives us everything it has without asking us for anything directly. It has always hoped that humans would realize that it cannot be exploited indefinitely. It strives to provide varied resources, but these are limited because they need a certain amount of time, years, maybe decades to recover. Each individual is important, they have a well-defined role in the food chain, so the actions of each individual matter. True, some actions on nature do not have immediate repercussions, but by adopting a sustainable lifestyle we can ensure a healthy life for our generation and the next generation, in harmony with the needs of our planet. Terms such as sustainable and sustainable development are constantly bandied about. Thus, sustainability is the ability to exist and develop without depleting natural resources for the future. Sustainability is the ability to endure in a relatively continuous way in different areas of life. In the 21st century, it generally refers to the ability of the Earth's biosphere and human civilisation to co-exist. Sustainable development (Brundtland Report), is defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". There are three main pillars that are promoted: environmental protection, social development and economic development. By protecting the environment, we mainly mean reducing the carbon footprint, water use, non-disposable packaging and wasteful processes as part of a supply chain. These processes can often be cost-effective and financially useful, as well as important for environmental sustainability. Actions to protect the environment are in symbiosis with the well-being of the population especially in terms of a person's health. Through small actions and collective actions, we can support this process of sustainability, realising the benefits but also the risks we are taking if we ignore the planet's signals.

CHAPTER 1: THE IMPORTANCE OF THE ENVIRONMENT AND THE LONG-TERM EFFECTS OF DEGRADATION

1.1. Introduction

The Environmental Degradation constitutes an issue of a great concern across the globe as the warning behalf the scientists who have long-identified the negative effects of the excessive use, and in several occasions, the abuse of the environment. Importantly, the environmental degradation has during the last few decades experienced some major definitions that can differ between them, causing some confusion. These differences can be characterised as 'normal' as it is an ongoing process which was developing and changing very rapidly, with the professional and academic research to contribute to this knowledge, enabling the researchers to add to the accumulated knowledge and create a more cohesive scientific background.

Therefore, in order to ensure a common background and understanding, the current work will use the official definition provided by the European Union (EU), and more specifically by the GEneral Multilingual Environmental Thesaurus (GEMET, 2021), an organisation which is committed in updating scientific terminology not only in EU, but also across several other countries, leading to common wording in a large number of scientific fields. Consequently, "Environmental degradation is a process through which the natural environment is compromised in some way, reducing biological diversity and the general health of the environment. This process can be entirely natural in origin, or it can be accelerated or caused by human activities. Many international organizations recognize environmental degradation as one of the major threats facing the planet, since humans have only been given one Earth to work with, and if the environment becomes irreparably compromised, it could mean the end of human existence."

The above identification is critically evaluated of a great importance as it provides the appropriate background on which further examination of the Environmental Degradation can be developed. The fact that the definition combines both the natural origins and the human (inter)actions enables a deeper examination which is considered of a primary importance. Finally, the reference on the threat of human existence on the planet constitutes a serious concern over our ability to effectively overcome the challenges, create the appropriate

protection shields that will help towards environmental protection, and of course, contribute towards the right policies that will ensure sustainable development.

1.2. Types of Environmental Degradation

Environmental Degradation has been identified in several levels and types due to the existence of different activities in several places in the world. This calls for the clarified identification of these Types in order to be able to proceed to a more clarified understanding of other parameters, such as geographical and causes. Hence, the following Types of Environmental Degradation are identified in order to clearly understand of the importance of the Environment and identify the long-term effects, and therefore, how to effectively overcome them:

i. *Water Degradation:* The Water Degradation occurs as a result of continuous pollution of the water resources such as the rivers and the oceans, causing serious damages to the local and fauna, both on the land and underwater. Several areas are considered to have been degraded as a result of large river pollution. A recent report by the Nonprofit organisation "Green Energy Future" has identified the 19 most polluted rivers across the world. Amongst them are the Ganges in India, Citarum in Indonesia, Sarno in Italy, Buringanga in Bangladesh, Marilao in Philippines, Mississippi in USA, Jordan in Israel, Mantaza-Riachuelo in Argentina, and Yamuna in India. The fact that most of the rivers are located in the Asian river does not come as a surprise due to the fact that the areas is the most populated region in the world. Coupled with the fact that the standards of living, as well as health and safety issues and regulations for the overall environmental protection are 'relaxed' the long-term effects are extremely negative. The most important effects are the irreversible damages to the water quality which has impact on the fishery and the ability of the inhabitants to continue drinking the water and making a living from it. The destruction of biodiversity is a major negative effect which stops fish from multiplying, causing serious concerns over the long-term survival of the rivers. Contamination of the food chain is a consequence of the destruction of biodiversity. Further, limitation on the potable water, increase of infant mortality, and finally, the increase of several diseases such as cholera are only

some of the long-term negative effects of the increasing water degradation across the world. The fact that this is not limited to poor and/or remote areas, but sadly, expands to the 'civilized' western world, is ringing a bell.

ii. *Land Degradation (Soil Pollution):* Land degradation which is also referred as Soil Pollution has been developed as a result of excessive and unlawful use of the land in highly-populated areas that lead the populations to the non-sustainable use of their land. In addition, the excessive use of land lead to the elimination of micro-organisms that are considered as essential for the operations and sustainable development and keeps it alive in difficult weather times. The examples of land degradation that have been identified by scientists are extensive. Some of them are the following; "water erosion (includes sheet, rill and gully erosion), wind erosion, salinity (includes dryland, irrigation and urban salinity), loss of organic matter, fertility decline, soil acidity or alkalinity, structure decline (includes soil compaction and surface sealing), mass movement, soil contamination (incl. effects of toxic chemicals and pollutants)" (NSW, 2019). Globally, it is estimated that at least 25% of the land already falls within the land degradation category and the total area that is directly or indirectly threatened with this sad phenomenon climbs up to 75%. According to the United Nations Convention to Combat Desertification (UNCCD) it is important for communities to develop programs that will be based on Land Degradation Neutrality (LDN).

iii. *Atmospheric Degradation:* Atmospheric degradation refers to the extensive air pollution, and just like the two previously mentioned types of degradation (land and water), are transferred from one geographical area to the other, pointing-out that the long-term effects on human lives. Atmospheric degradation is caused by several factors; however, the vehicular and industrial emissions are considered to be the two most common. The extensive development of air traffic is also considered to be a major contributor, leading to a serious negative impact on the lives of people in countries and cities that host the largest and busiest airports. This calls for both the companies and the national authorities to find new ways for the airplanes to travel, in terms of fuels. All the above lead to the extensive carbon dioxide which is considered by the scientists to be the major greenhouse gas that for several decades to contribute to global warming, with

obvious negative effects on the lives of people. Finally, Odours in poor sanitary areas is another major contributor to the atmospheric degradations.

1.3. Causes of Environmental Degradation

The identification of the Causes of Environmental Degradation is considered as essential in order to clearly understand the long-term impact on the environment, and therefore, ensure that the appropriate solutions by the scientists and the national governments shall be designed and applied at all levels. The cooperation of the two, Public and Private Partnerships (PPP) is crucial in ensuring that there will be maximisation of potentials, increase capacity, take advantage of the accumulated knowledge, create synergies, hence, lead to the best possible results that will effectively reach the goals. The EU pays exceptional attention in the PPP with the European Green Deal (EGD, 2019) to provide specific guidelines.

Therefore, the major Causes of Environmental Degradation are:

i. *Land Disturbance:* In order to increase production of popular food, millions of people and food producers across the world are using land for planting and producing products that are considered as 'foreign' for the specific area. Products such as garlic and onion as well as other popular herbs have been blamed for the land disturbance, especially in poor and/or remote areas.
ii. *Pollution:* The Pollution of natural resources is a major human activity in order to increase capacity and maximise profit. Pollution is visible in both water and land, creating concerns over the long-term impact on the health of people. Regions such as Asia and Africa are considered to be the major victims of this activity, however, this is expanded across all countries, at different levels.
iii. *Overpopulation:* Overpopulation, especially in areas such as Chin and India that total up to 2.8 billion is evaluated as a major contributor towards the Environmental Degradation. Overpopulation means that more people will demand more food and water, more frequently. This leads to higher production which the land cannot 'afford', hence, causing permanent damages.
iv. *Landfills:* Excessive use of products as they have already been identified lead to the creation of more Landfills in a closer distance between them. This creates serious problems not only in terms of public health, btu also, in terms of beauty

in certain areas. Several areas have been seriously abused by the local authorities, leading to legal and financial implications.

v. *Deforestation:* Deforestation is another common cause for environmental degradation and it is clearly visible across the world. This leads to poor air quality as trees absorb emissions. Countries such as Brazil not only have failed to comply with their obligations but unfortunately, they have promoted deforestation in order to increase production on several profitable products such as coffee.

vi. *Natural Causes:* Natural causes such as earthquakes, avalanches, tidal waves, storms, and wildfires, can lead to a total destruction of the environment. The size of such natural activities can to a great degree determine the size of the disaster. In several occasions, natural causes are triggered by human activity, calling for national authorities to implement strict precaution measures.

vii. *Ruinous Agricultural Practices:* in several occasions farmers are using practices that do not comply with the needs and wants of contemporary times, leading to serious negative effects. Further, competition amongst farmers can also lead to ruinous practices, that in several occasions can be considered as unethical, calling for the farmers' education behalf the national authorities.

viii. *Improper Land Use and Development:* In order to obtain quick and easy profit, an increasing percentage of the population across the world. Especially in developing countries, are 'transforming' their rural areas into urban. Rapid building development in mining areas are a common characteristic in several places across the world, which leads to serious negative impact on people's health.

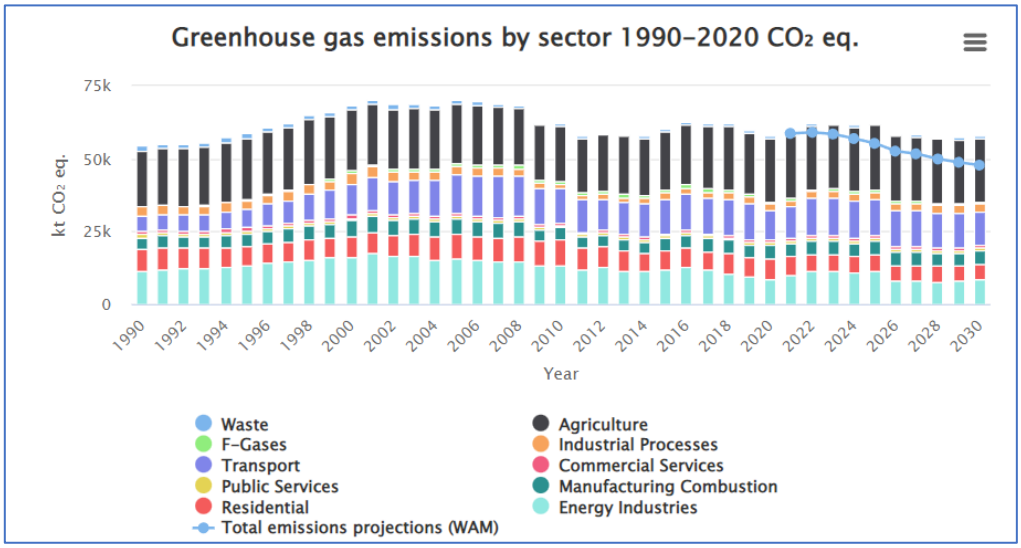
ix. *Technocentrism:* Technocentrism is a term that has been developed in order to describe the trend in industrial countries to build heavy industries in one single area. Technocentrism has led to the excessive use of land and resources, both natural and human, with short-term benefits, however, this has long-term negative effects, especially for the local people.

x. *Defective Agricultural Policies:* Unfortunately, the role of national authorities is not always a positive one, as of course it is expected. Defective Agricultural Policies are common in several countries, either due to poor research and planning, or even worse, to serve private or personal interests. Hence, conflict

of interest is an issue that causes serious political and public conflict in a lot of societies, especially in countries that face poor transparency.

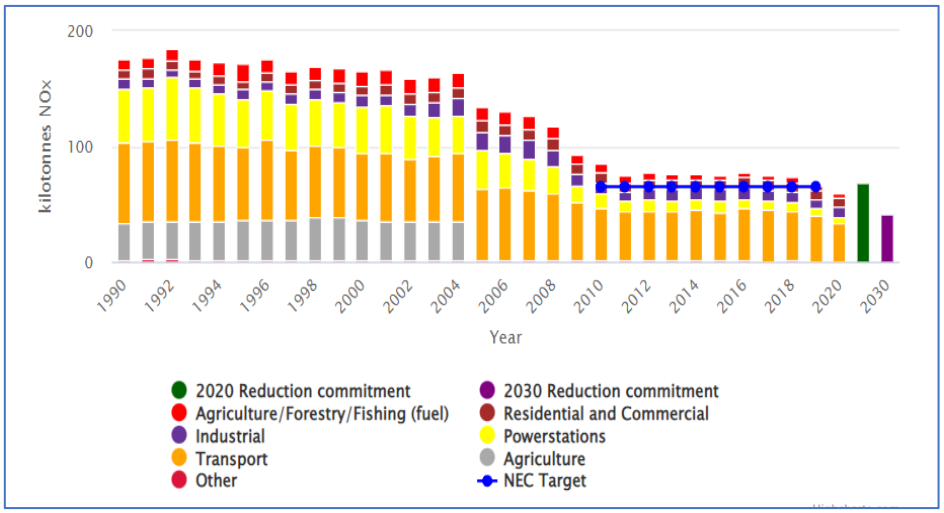
1.4. Environmental Degradations Statistics

In order to obtain a deeper understanding a clearer view over the real impact of Environmental Degradation, following there will be some major statistics (EPA, 2022).



Graph 1. Greenhouse gas emissions by sector 1990-2020

Graph 1shows that the Agriculture Industry constitutes the most important contributor to the Environmental Degradation. This explains some of the causes as they have been identified, such as Defective Agricultural Policies and Ruinous Practices.



Graph 2. Air Emissions - Nitrogen Oxides

Graph 2 reveals that the Transport Industry is the highest in the Air Emissions - Nitrogen Oxides, with the Powerstations to follow. Important is the 2030 milestone which focuses on reducing Emissions as identified in the EGD.

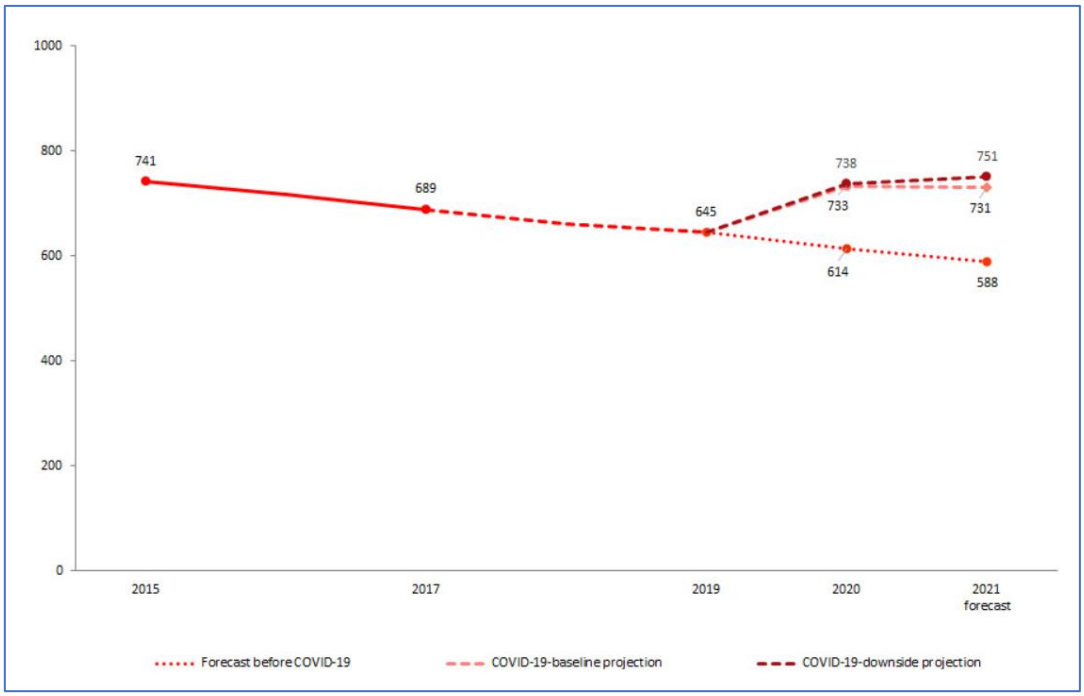
1.5. 🌎 Environmental Degradation: Long-term Negative Effects

All the above-mentioned issues lead to the identification of some important long-term negative effects that need to be seen as a cohesive concept in order for national authorities, as well as industries and businesses to focus on taking measures to tackle the increasing problem. The cooperation between the Public and Private sectors (Public and Private Partnerships – PPP) is considered as an essential part in this procedure.

i. *Impact on Human Health:* The first and most important long-term negative impact refers to the most valuable thing that people have; their lives. The progressive development of environmental degradation has massively impacted the quality and quantity of peoples' lives across the world, with several remote and/or disadvantaged areas, especially in Asia and Africa, to experience serious problems with the infant mortality to be at the highest level of all statistics. Specific causes just as the poor air quality in over-populated areas lead to the death of at least 300.000 people across the world. Further, other reasons such as the toxic landfills cause serious diseases such as cholera, and for some countries this is a very difficult issue to deal with.

ii. *Poverty:* Poverty is the situation that people do not earn enough money that will cover their basic needs and ensure a specific acceptable standard of living. The poverty level differs from one country to another as a result of different standards and earnings in each country. Extensive environmental degradation leads to poverty as people cannot use their land in order to produce the much-desired products that will ensure their survival. Unfortunately, the poverty level has intensified as a result of the Covid-19 pandemic outbreak which has caused more concerns over the long-term effects, and despite that environmental degradation is not the only cause of this increase, it is considered to be the major cause. Graph 3 outlines the number of people that suffer from poverty (UN Stats, 2021), both absolute and relative. As it is seen in the Graph, the number of people living below $1.90 a day is expected to reach 751 million people across the world, a massive increase of 106 million in just two years. It is

obvious from more numbers provided by the UN; the environmental degradation plays a key role.



Graph 3. Number of people living below $1.90 a day, 2015 - 2020 nowcast, and forecast before and after COVID-19 (millions)

iii. *Atmospheric Changes:* The combination of serious effects of land degradation, such as the landfills and land pollution lead to the creation negative synergies against the atmosphere. These can lead to global warming and climate change which can substantially increase the risk of climatic natural disasters, and ozone layer depletion. The latter can cause serious illnesses such as skin cancer, eye disease, and crop failure. In advanced economies these diseases can have a high level of possibility to be cured, however, in most remote and disadvantaged areas, especially in Asia and Africa in which the National Health Systems either do not exist or they face serious problems to a level that can be considered as not appropriate in order to provide the least expected supporting treatment. The figures outlined in Graph 3 clearly reveal that the increasing percentage of people that live within the poverty level will suffer as a result of atmospheric changes. The UN have long been warning for the negative effects of atmospheric changes.

iv. *Loss of Biodiversity:* Loss of Biodiversity is one of the most worrying long-term effects of environmental degradation. The concept of Biodiversity has often caused confusion amongst scientists, national authorities, and people. The American Museum of Natural History (2022) provides a rather clarified approach and identifies that "The term biodiversity (from "biological diversity") refers to the variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life." The overpopulation of certain areas, poor agriculture policies, extensive land use for building, mass tourism, deliberate destruction of natural systems, and other several causes lead to the loss of Biodiversity, causing concerns over the willingness of national governments to place environmental protection over powerful private economic interests. The UK Royal Society (2021) has identified that countries such as Indonesia, Malaysia, Papua New Guinea, China, India, Australia and the USA, are experiencing some serious problems with the loss of bird and mammal species to have reached 60%, causing further concerns over the continuation of the chain of the wildlife in these areas, and of course, across the world. The loss of Biodiversity is expanded in the oceans with nearly all seas across the world to face some serious problems. Despite that there are fluctuations in the level of Biodiversity loss, the problem remains at place.

v. *Scarcity of Natural Resources:* The Scarcity of Natural Resources, especially that of water, either for watering or drinking, is evaluated as a serious problem in the chain of environmental degradation across the world. UNICEF (2022) provides some important information about the scarcity of water. Amongst others, UNICEF explain that four billion people experience severe water scarcity for at least one month each year and over two billion people experience inadequate water supply. As a result of all the above environmental degradation and extensive water scarcity, until 2022 half of the global population will be living in areas facing water scarcity, over 700 million people are expected to be displaced by 2030, and finally, by 2040, approximately 25% of all children are expected to be living in areas that experience high water stress. This will lead to other diseases that will have extreme financial cost.

vi. *Economic Meltdown:* The economic effects of environmental degradation is also considered to be another major issue that needs to be clearly evaluated in order to provide sustainable solutions. Countries that face the phenomenon, especially in poor countries, the economic consequences are severe as:

- They do not have the adequate resources, both human and financial in order to create the appropriate background that will support economic growth in the field of environment.
- They have little power to negotiate improved trading terms and deals that will enable them to become more competitive, with placing the environmental protection at the forefront of the interest.
- Develop more jobs in the field of Green Economy in order to enable the incorporation of more young talented people that are currently moving towards immigration in other countries.
- Social Cost: The environmental impact leads to higher social cost in terms of food prices, in which poorer countries cannot afford the long-term high cost. This can lead to social exclusion.
- Access to Education is also an important element as the economic meltdown leads to the availability of less resources that decrease the ability of young people to ensure education.
- Access to Health in poor countries in Asia and Africa, as well as in several other areas, is a major consequence of environmental degradation, with the UN to wand over the long-term negative effects.

vii. *Social Exclusion:* The rapid development of environmental degradation has led to extensive social exclusion, as peoples, especially young ones, are facing difficulty to become more socially active. This includes activities at schools at all levels, access to sports events in which team work and participation is required, and other social activities that fall within the daily activities. All these lead to some serious consequences such as becoming self-introvert. Given that in poor countries there are not enough structures in order to ensure support to these people, social exclusion is considered as a real threat for the health and lives of young people that have the need to socialize.

References

American Museum of Natural History (2022). *What Is Biodiversity?* https://www.amnh.org
Earth Eclipse (2022). *What is Environmental Degradation?* https://eartheclipse.com/environment/10-striking-reasons-environmental-degradation.html
Environmental Protection Agency (2022). *Greenhouse gas emissions by sector 1990-2020* https://www.epa.ie/resources/charts—data/climate/greenhouse-gas-emissions-by-sector-1990-2020.php
European Commission (2019). *A European Green Deal.* https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
GEMET (2021). *Environmental Degradation.* https://www.eionet.europa.eu/gemet/en/concept/15154
NSW Department of Planning, Industry and Environment (2019). *Soil degradation* https://bit.ly/3ObEvZu
UNICEF (2022). Water Scarcity. https://www.unicef.org
United Nations Convention to Combat Desertification (UNCCD) (2022). *How much do you know about Land Degradation Neutrality?* https://www.unccd.int
United Nations Statistics (2021). *End poverty in all its forms everywhere.* https://unstats.un.org/sdgs/report/2021/goal-01

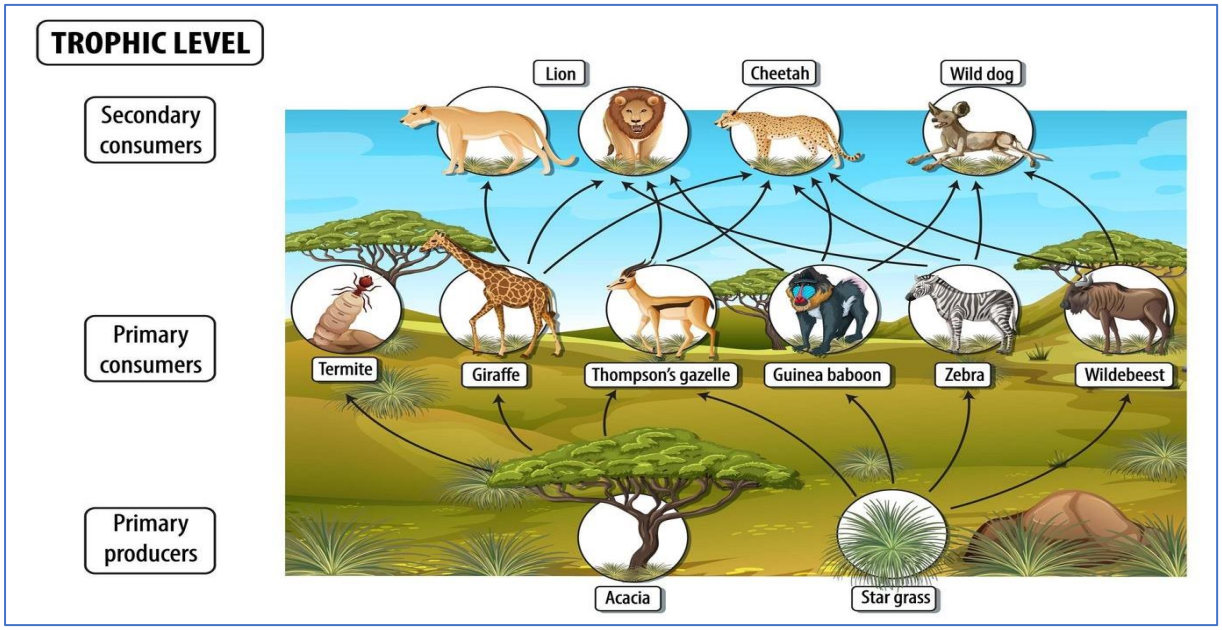
CHAPTER 2: THE IMPORTANCE OF MAN IN THE FOOD CHAIN REGARDLESS OF AGE AND HOW HE CAN CONTRIBUTE TO THIS PROCESS

2.1. Introduction

Food Chain is a complex concept in the environmental setting and this calls for the right identification in order to have the ability to develop a clearer understanding and ensure a proper development of the current work. One of the best definitions is provided by the globally recognised Britannica encyclopedia (2020). More specifically, Britannica clearly suggests that "food chain, in ecology, the sequence of transfers of matter and energy in the form of food from organism to organism. Food chains intertwine locally into a food web because most organisms consume more than one type of animal or plant."

Graph 4 provides a view of how the Food Chain is operating within its natural setting, enabling a better understanding of how each one of the elements in this process should be viewed and how they affect each other. It also enables the understanding of the human interaction, all shall be examined within the current work

Graph 4. Food Webs



2.2. 🌎 Man Interaction: Standards & Certifications

In the Food Chain process, it is important for the industries, the individual businesses, and most importantly, the national authorities, to ensure that they will follow specific rules, regulations and well-established standards on a global scale. The ISO Standards can provide a solid framework that will help all actors in the process to become more effective and deliver the best possible results in the Food Chain.

2.1. ISO 22000:2018 - Food Safety Management Systems

The ISO 22000:2018 – Food Safety Management Systems focuses on providing the industries and businesses to ensure quality in the Food Chain. Therefore, the major objectives of the specific ISO are:

a. To plan, implement, operate, maintain and update a Food & Safety Management System (FSMS) providing products and services that are safe
b. To demonstrate compliance with applicable statutory and regulatory food safety requirements
c. To evaluate and assess mutually agreed customer food safety requirements and to demonstrate conformity with them
d. To effectively communicate food safety issues to interested parties within the food chain
e. To ensure that the organization conforms to its stated food safety policy
f. To demonstrate conformity to relevant interested parties
g. To seek certification or registration of its FSMS by an external organization

The specific ISO certification provides the unique ability to industries and businesses to enhance their human interaction in the Food Chain process, ensure quality improvement at all stages, create the opportunity to businesses to become more competitive, and enable their human resources to develop as part of the process. Importantly, for the Small and Medium Enterprises (SMEs) which have less opportunities, experience, financial support, and access to the market, the specific ISO certification provides a unique opportunity for human interaction in the Food Chain from a professional point of view. Several examples in small countries such as the Republic of Cyprus, especially during the Covid-19 pandemic outbreak revealed its importance as they have enabled them to remain focused on Quality.

2.2. HACCP Principles & Application Guidelines

Further to the crucial ISO Certifications, another one globally accepted Food Chain certification plays a key role. That is the Hazard Analysis and Critical Control Point (HACCP), which is based on seven specific principles (HACCP, 1997).

i. *Principle 1:* Conduct a hazard analysis – Identify the most important hazards in the food chain. These hazards are considered as the biological, chemical or physical agent in the food chain that need to be detected, avoid possible crisis in the organisation that can potentially become a disaster.

ii. *Principle 2:* Determine the critical control points (CCPs) – This enables the understanding of the major elements that cause problems in the food chain and the procedures that are undertaken by food chain managers at all stages. Each CCP carries its own unique importance that needs to be ensured for the food chain benefits.

iii. *Principle 3:* Establish critical limits – It used as an extension in the CCP and enables the food chain managers to identify problems and set limits on elements such as the temperature, time, physical dimensions, humidity, moisture level, water activities.

iv. *Principle 4:* Establish monitoring procedures – Monitoring all procedures at all possible stages is vital in order to take possible corrective measures that will ensure quality. Quality in food chain is vital, especially when several people are involved.

v. *Principle 5:* Establish corrective actions – The HACCP system for food safety management pays exceptional attention in the corrective actions. Fluctuations in Quality levels may impact overall performance and cause confusion in the food chain and affect decisions made by the human resource.

vi. *Principle 6:* Establish verification procedures – The establishment of procedures helps the human resource to become more active and careful in the food chain procedures. This will help towards the improvement of Quality at all stages, especially when the primary problems may be identified.

vii. *Principle 7:* Establish record-keeping and documentation procedures – Record keeping and documentation is important in the food chain as it enables the food managers to identify trends in the quality. Further, it enables the food managers to benchmark with the rest of the industry.

2.3. 🌎 Human Interaction through Information Technology (IT) in the Food Chain

The rapid development of Information Technology (IT) at all levels of the economy, of course including the agriculture development, environmental degradation, and most importantly, the ability of national authorities and international organisations (such as the EU) to develop the appropriate policies that will contribute towards confronting the problems. The Food Chain can be highly benefited from the IT development, which however, needs to be based on specific principles at all stages.

Therefore, the IT can be used through the following ways in the Food Chain:

- Education of the professionals in the agriculture field in order to understand the long-term positive impact of the IT in the Food Chain, especially in the remote and/or disadvantaged areas.
- Governmental support to the professionals in the Food industry in order to invest in contemporary IT that will help them improve their ability in the Food Chain, especially in the remote areas.
- Investment in the biotechnology which is used to create genetically modified organisms (GMO) that can be important in the Food Chain, in a way that will not harm the environment.
- Precision agriculture which uses satellite pictures and provides national authorities and land farmers with the ability to have a clearer view of how things can substantially improve through real-time pictures.
- Drones are one of the latest forms of IT in the Food Chain as it can provide crucial information for purposes of border movements, port activity, public-safety reasons, environmental monitoring and university research
- Use of 3D Printing in the last part of the Food Chain procedure, especially with the use of sugar that can provide alternative and ensure less usage of valuable resources in the food line.
- Food waste tracking IT that will help the national authorities to identify those people that pollute certain areas, therefore, increase the potentials of substantial improvement of both quantity and quality of the Food Chain.
- Development of improved e-Procurement procedures that will enable acquiring better raw materials that will increase production and ensure better and more competitive prices in the real market.

- Establishment of Food Safety Information System. This will include internal and external traceability, wireless sensor technology, and communication with both the retailers and the clients.
- Improvement of Logistics and Supply Chain Management that will help the producers in the transportation procedures. This will help them improve the quality of products delivered to the end users.
- Improvement of Warehousing of the raw materials that are intended to be distributed towards the Food Chain. This will also ensure the improvement of Food Chain and avoid environmental degradation.
- Establishment of Data Analytics software that will help the farmers to take fact-based decisions, rather that assumptions. This requires extensive training and identification of all major elements.

All the above require the cooperation with the best possible providers in the field of IT and Agriculture. Companies such as Microsoft have developed strategic partnerships with several national governments and regional economic organisations in order to provide support in the field of Agriculture. Agriculture ERP Software is only of the several tools that the human resource in the Food Chain can use in order to improve their productions.

Further to the above, it is important for the national authorities to focus on the young ages in order to educate them about the need to protect and respect the environment, explain the role of Food Chain and its long-term impact on natural life. Organisations such as 'Water Teachers' have developed powerful tools that can suit the skills of children at different ages.

Raising the awareness of the children will have long-term effects that will help towards preserving the natural life, and consequently, the entire Food Chain, especially in areas that are facing serious financial and technical problems. It is therefore important for the educational systems and the national authorities to develop strategic partnerships with such organisations that will ensure that the human interaction, at its earliest stages, will occur at a level that will create the opportunities for sustainable development.

References

Britannica, The Editors of Encyclopaedia (2020). "Food chain". *Encyclopedia Britannica*, https://www.britannica.com/science/food-chain
HACCP (1997). *HACCP Principles & Application Guidelines.* https://www.fda.gov/food/hazard-analysis-critical-control-point-haccp/haccp-principles-application-guidelines
ISO (2022). ISO 22000:2018. Food safety management systems — Requirements for any organization in the food chain. https://www.iso.org/standard/65464.html
Water Teachers (2020). *17 Cool Ways to Teach Food Webs and Food Chains, In Person and Online.* https://www.weareteachers.com/food-webs

CHAPTER 3: THE BENEFITS OF PROTECTING THE ENVIRONMENT

ENVIRONMENT

It is essential to protect the environment so as to reduce the destruction of ecosystems caused by a multitude of human activities. Awareness of the risks by each individual is a first step towards change, it goes hand in hand with awareness of the reasons and benefits for fulfilling our moral duty to care for the planet that provides us with a home, a meal and sustains our daily lives.

We can group the main reasons into 2 broad categories:

The first reason is related to: protecting the ecosystem. Without realising it, or sometimes knowingly putting the ecosystem at risk. So, protecting forests, oceans, animals and all living things is in our power.

The second reason is related to: protecting humanity. We are intelligent beings; we are also the decision and action makers in the food chain. We as humans have the ability to understand and see the problems facing our planet. We also have access to many resources and solutions to protect it. The picture we have of the world now is different than it was 100 years ago for example. And future generations will live on a totally different planet from the one we know. The changes we make will improve both the lives of future generations and the quality of life of our generation.

The main benefits of living in harmony with nature:

1. Protecting the environment protects humanity. Pollution, for example, is one of the most dangerous factors affecting the environment. It affects the quality of food leading to ingestion of toxic substances. Digestion of toxic substances can cause health problems. Air pollution can lead to: respiratory infections; reduced lung function; worsening asthma; cardiovascular disease. Water pollution can cause: dysentery; kidney problems. Soil pollution has been linked to: cardiovascular disease; endometriosis; impaired nervous system development in children; hypertension; impotence. Thus by protecting the environment, certain health problems can be prevented or made worse.
2. Protecting food resources. The environment helps to protect the ecosystem, so changes affecting the ecosystem put many species at risk of extinction, requiring environmental

protection. Biodiversity is a significant part of life in the world: Biodiversity is not only made up of animals living on land, but also forests, grasslands and tundra, which are significant features in maintaining the life cycle of the ecosystem. The sun, for example, provides light for plants. Plants are food for insects and animals, which in turn are consumed by other animals. Therefore, destroying the environment would destroy the food chain system.

3. Rebalancing the climate. Trees, for example, play a crucial role in climate. Large forests tend to influence weather patterns, creating their own microclimates and a balance in ecosystems results in rainfall.
4. Forests act as giant sponges that capture runoff instead of letting it roll off the surface. Water that passes beyond tree roots drains into aquifers, supplementing groundwater resources that are important for drinking, sanitation and irrigation around the world.

   Another essential role is in blocking wind or breaking gusts of wind. Trees reduce wind speed, and if planted around sensitive crops they protect them. In addition to protecting these plants, less wind makes pollination easier for bees.

   Trees, with their network of roots, stabilise huge amounts of soil, strengthening the foundation of the whole ecosystem and preventing landslides or dust storms.

   Forests give us clean air: the air we breathe is less harmful to us because trees act as a natural filter to remove harmful particles in addition to using carbon dioxide and converting it into oxygen.
5. Protecting drinking water resources. 20% of our drinking water comes from forests. In forest ecosystems, rainfall and moisture are transformed into groundwater that is collected as freshwater used for drinking.

   Another benefit is economic stability. Many people are working because of the forest and millions of jobs would be lost without it. Agriculture in general is also an economic force, from small local producers to mass production we can say that nature supports millions of people economically through what it provides.
6. Better physical health goes hand in hand with air quality generated by forests or in parks. This can help improve lung health and there are many recreational activities to be found there too.
7. Prevent soil erosion through responsible agricultural practices. Environmental conservation could prevent soil erosion: Soil erosion is a factor that occurs due to various human activities that have led to environmental degradation. Erosion can occur

naturally due to the impact of water and wind or it can be encouraged by irresponsible practices. So by paying attention to the way farming and logging are carried out, we can improve the quality and quantity of products, but above all we can protect the environment.

8. Prevent global warming. Intentional deforestation or uncontrolled burning accelerates global warming, making the Earth hotter. Forests, for example, slow down this process because carbon dioxide is stored in trees and also turns it into oxygen.
9. Benefits for mental and emotional health. The visual and mental stimulation that the forest provides enhances our imagination and is a source of motivation.
10. Benefits for tourism and medicine. Tourists are mainly attracted to areas such as forests and botanical, zoological gardens which are all part of our environment. Also since ancient times most of the treatments that are used today have been and are extracted from the plains.

🌳CHAPTER 4: PROTECTING THE ENVIRONMENT BY CONCRETE BEHAVIOURS

4.1. 🌎 Rs Guide + 2

When it comes to protecting the environment, the benchmark is the 3Rs-Reduce-Reuse and Recycle. The 3 Rs stand for Reduce - Reuse - Recycle. The phrase expresses awareness of environmental problems and a way to promote environmentally friendly behaviour among people. Two more steps have been added: Recovery and Disposal.

Reduction means reducing the amount of rubbish we generate.

Reuse means finding new ways to use things that would otherwise be thrown away.

Recycling means turning something old and useless (a wooden tray) into something new and useful (like a table or a dustpan).

Recovery - when it cannot be recycled, a way must be found to produce energy or new material by processing non-recyclable waste.

Disposal - secondary waste from the recovery process which is generally in the form of ash or other waste is taken to landfill to be processed so as not to damage the environment.

Starting from the 3Rs, the aim is to create responsible habits that can help optimise the use of natural resources and reduce the amount of gases that arise from human actions.

Reduce.

The first step is to reduce the amount of waste each of us produces so that we end up having as little impact on the environment as possible. That's why it's a good idea to start by refusing plastic bags, plastic straws, plastic-wrapped fruit, plastic containers and disposable cutlery at the shop.

Reducing the amount of food you buy is also the most important of all waste management options. The key is to buy only the goods you need and in the right quantity.

Other ways to reduce:

Choosing the items you need, not necessarily the ones you want immediately: people who keep updating their electronics (e.g. mobile phones) to the latest trends even if their existing device is still in good condition. This is where the question "Do I need a new one?" is used. If the answer is no, then your decision helps the environment and saves electricity. A little trick is to wait a day when you really want something! The next day you might not want it, and if you don't want it, you don't need it!

Smart shopping. When you go shopping try to focus on items that may last longer e.g. reusable water bottles, natural textiles, metal containers etc. Before you buy the item ask the question above: do I really need it or do I just want it?

Buying local: As well as boosting the local economy, buying local means we can reduce the negative environmental impact caused by transport.

Avoid wasting paper when you can: Wherever possible, instead of printing paper, opt for digital delivery. Another environmentally friendly option is to use cloth napkins instead of paper ones that can be washed and cleaned.

Reuse:

Is the optimal solution to reduce the amount of waste you no longer use. Along with finding new ways to reuse a material that at first stage may fall into the waste category. In addition to the environmental benefits, it is a way to save money in the long run.

Your asset - someone else's treasure: can the materials you want to throw away be used by someone else? Clothes, for example, can be donated instead of thrown away. Also various household and garden accessories. It's a dual purpose action. It reduces consumption and you can help someone less well off.

The most common example of this strategy is the reuse of plastic or glass bottles that can be turned into useful or decorative objects. The same applies to furniture or objects made of wood or metal, which are repaired to create new pieces from them.

How can you reuse plastic?

Plastic bottles can be turned into: jewellery holders, hair accessory holders, holders for pens, charcoals and other writing utensils, flower pots. At the campsite, instead of being left in a green space, a bottle can be cut up after emptying and used as a cutlery holder, for example. Jars can be reused for home-made preserves or for storing accessories in the kitchen or garden.

Oil - special category.

Kitchen oil can be reused:

After use, strain the oil through a cheesecloth or other filter to remove any food particles. Then carefully pour it into a sealed container and store it in the refrigerator until ready to use. Reused oil can be stored properly, as rancid oil can cause harmful bacteria to grow. When you decide not to throw it away, take it to oil collection points.

Before we move on to the next step we need to point out the difference between reuse and recycling: reuse involves using the same item or natural resource again and again, recycling refers to turning waste into something useful.

🌎Recycling:

Recycling is the introduction of residues or wastes into a technological process to achieve reuse and recovery or for environmental purposes. Recycling reduces the consumption of new raw materials and also reduces energy consumption and the level of contamination of the natural environment. Through recycling, waste is broken down into its basic materials and transformed into new products. Ideally, this should mean less need for raw materials. Instead of mining or creating new raw materials, it should be possible to use recycled materials. Then the energy, time and work involved in extracting raw materials should be used in a single operation - recycling.

Before products can be sold, raw materials must first be extracted, refined, then assembled into components and finally into the products we see. Each step along the production chain requires natural resources, energy, labour and time. Each step may require transport and each step may have an impact on the environment (fuel, electricity, human labour which in turn has to move). All these efforts result in the final product that humans consume or use. Each final product has a series of steps and a smaller or larger amount of resources invested in it. When a product is discarded at the end of its life cycle, all the effort and value that went into it is destroyed with it. All forms of recycling are an attempt to retain some of that effort and resources consumed in its production.

Recycling paper and wood saves trees and forests. Yes, you can plant new trees, this is also recommended, but there are certain species of forests that cannot be saved or take a long time to regenerate.

Recycling plastic means creating less plastic, throwing away less plastic which is usually made from fossil fuel hydrocarbons.

Recycling metals means less need for risky, costly, harmful mining processes.

Recycling glass reduces the need to use new raw materials such as sand - it seems hard to believe, but supplies of certain types of sand are starting to dwindle around the world.

Recycling can save money. Recycling waste is much cheaper than regular waste collection and disposal. Also a person instead of buying an item that they are going to pay money for can replace it with another item they have already bought.

In short, using all or part of an item that has already been used reduces environmental impact by avoiding waste incineration, land and water contamination from the build-up of toxins and energy use in the creation of new products.

What materials can be recycled?

To make recycling easier to organise, waste is divided into two categories: recyclable household waste and residual household waste.

a) Recyclable household waste - this is waste that can be divided into the categories indicated on the waste bins (glass, plastic/metal and paper/cardboard). For example: magazines, newspapers, stationery, envelopes; boxes, photos, egg cartons, pizza boxes (top only), plastic cans and boxes, plastic bags, plastic protective packaging, plastic toys, drink cans, tins, glass beverage bottles, glass cosmetic containers, glass trays, jars, cups, mugs.

b) Residual household waste - is that which is considered rubbish in the true sense of the word and cannot be recycled, such as: food scraps (meat, dairy, vegetable, eggs), disposable diapers, absorbents, pet waste/excreta, vacuum cleaner bag contents, cigarette butts, used napkins, heavily soiled packaging, ceramic and porcelain shards, heavily soiled disposable tableware, ashes from stoves (if not only wood is burned but also charcoal), vegetable yard waste (if treated with pesticides), treated or painted wood, etc. a.

How can we recycle? - Colour code

Blue - paper and cardboard

Examples: A4 sheets, paper scraps, newspapers, magazines, post-its, envelopes, boxes, photos, paper bags, newspapers, paper-cardboard packaging; beverage cartons, egg cartons, maculature, pizza boxes, etc.

Do not collect cardboard and paper containing food residue or that are soiled, stained or oily, used napkins and kitchen paper, glossy wrapping paper, waxed paper, waste paper packaging. All recyclables must be clean and perfectly dry.

Yellow - plastic and metal

Examples: plastic foils and bags, plastic cans and jars, toys, protective packaging, plastic cans and containers from various beverages (PET), plastic stoppers, plastic containers for food drinks, clean bags or foil, food sprays, metal packaging (cans, stoppers, tins, etc.), other small or medium-sized plastic or metal household items; plastic containers from various beverages (PET), necessarily empty and rinsed with cold water, tins, kitchen cutlery, cans of juice or other drinks, etc.

Green - Glass

Can be collected: glass jars and containers from beverages and food;

Not to be collected: vases, glasses, glassware, high temperature glass, ceramics, porcelain, flower pots, light bulbs and lamps, glass and mirrors.

Do not collect those made of a combination of plastic and metal.

It is recommended that plastic containers are cleaned with cold water before recycling. If the dirt does not clean off, then they should be disposed of in the residual waste category. PETs should be pressed after removing the cap

Grey/brown - biodegradable

This is the waste from which compost is made, a fertiliser that can be made by people living at home in their own yards.

You can recycle: Vegetable scraps from the yard, coffee grounds, egg/nutshells, bread scraps, vegetables and fruit, wet products (newspaper, cardboard, shredded wood, dirty napkins, dirty paper) fresh or cooked fruit and vegetable scraps, bread and cereal scraps, tea grounds including tea bags, ashes from stoves (when only wood is burnt), sawdust, hay and straw, vegetable waste from the yard (shredded leaves, branches and twigs, flowers), house plants, shredded wood, newspaper, shredded cardboard - wet and dirty, paper napkins.

Black

Residual waste: this includes all waste that cannot be recycled.

You cannot recycle: nappies, vacuum cleaner bag contents, food scraps (meat, dairy, vegetable, eggs), disposable nappies, sanitary towels, pet waste/excreta, cigarette butts, used napkins, heavily soiled packaging, ceramic and porcelain shards, heavily soiled disposable crockery, ashes from stoves (if not only wood is burnt but also charcoal), treated or painted wood, etc.

Not allowed: Textiles, footwear, sand, earth or gravel, batteries, motor vehicle parts, mattresses, furniture or carpets are not allowed.

Red

Red means "hazardous waste", e.g. empty paint and paint packaging, used car oils, packaging contaminated with hazardous substances, certain medical waste;

Not to be collected: all other types of non-hazardous waste specified for other containers of different colours.

Special waste

This category includes the following sub-categories: textile waste (clothing, footwear), vegetable waste (grass, trees, cut grass, etc.), bulky waste (furniture, carpets, mattresses, etc.), etc. Collection is free of charge during collection campaigns on the basis of an established programme. Outside the established programmes, collection will be made on request, against payment). construction waste (this is collected against payment following a request and last but not least waste electrical and household appliances.

- For special categories of waste, for example bulky items, it is recommended that owners ask their local town hall or owners' association how to proceed.

Orange (only found in certain locations, no general rule)

This colour is specifically dedicated to metal, in them you can recycle: beverage cans (beer, soft drinks), canned food (vegetables, meat, fish, animal feed), aluminium plates and trays (for take-away meals), metal sheets and lids, bags and thermal containers for food (soups, purees, pasta, coffee, snacks, etc.), aluminium foil for the kitchen.

General recycling rules

- bottles, cans, jars must be emptied and cleaned. Most items need to be washed and dried before they are disposed of in the recycling facilities;

- after cleaning, the lids are removed from the cans and pressed to save space;

- soiled clothing should not be thrown in with clean clothing that can be recycled;

- paper and cardboard should be packed as tightly as possible, cut or torn

- any traces of oil or water or dirt of any kind indicate that the paper/cardboard cannot be placed in the blue category, but in the biodegradable category;

- hazardous waste must be collected correctly and with great care; for these there is the colour red.

- all residual waste should be placed in bags which are tied and placed in the black bin;

- household waste is not deposited directly in the black bin, but in bags that are closed/tied before being deposited in the container.

- to make it easier, use coloured bags at home.

Concrete steps for proper recycling: (S.C.P)

1. Sort
2. Clean
3. Press
4. Throw

In the first step - sorting - waste should be separated into the following categories: plastic, glass, cardboard, household (and metal - where appropriate). To make recycling easier, it is recommended to use separate containers (bins) from the outset, because sorting from the moment you throw the item away is quicker, easier and, over time, creates an automaticity. In the next step, it is recommended to clean objects, when necessary, for example a tomato sauce can, not leaving leftover food in it. It can be taken out and washed in the sink and then moved on to the next step. Depending on the material and size you can press or fold. For example, for a plastic bottle, remove the cap and press it. In the last step you throw it in the right bin.

As for household waste, it can be disposed of by **composting**

Composting is the best way to recover all kinds of organic waste.

Composting is the process of decomposition and transformation of solid organic substances by micro-organisms (mainly bacteria and fungi) into stable material, which can be used (depending on its characteristics) in agriculture instead of chemical fertilisers or in land improvement (soil improvement).

Composting can be done in households, in open heaps, in special plastic compost bins or in other containers. In the case of farms and composting stations, composting can be carried out on specially designed platforms, with the material to be composted arranged in long rows (windrows) and turned periodically (using special windrow reshuffling equipment), in aerated static heap systems using perforated pipes or in special containers.

The main categories of waste that can be composted are: garden and park waste, household and similar waste (fruit and vegetable scraps, egg shells and other food waste), waste from markets and food complexes;

Main advantages of composting:

- ensures protection of the environment in the vicinity of livestock farms and throughout the area where it is applied;
- it is an efficient recycling method for crop residues
- replaces a bulky, highly moist, difficult to transport product with a concentrated product, easily transportable over any distance, odourless, pathogen-free, capable of controlling the development of diseases and pests in the soil, easy to store, does not create problems with flies or weeds and can be applied to the field at the most convenient time; the final product yields less nutrients accessible to plants and can be applied to the field for a longer period;
- it produces a valuable fertiliser for agriculture, especially for the vegetable and flower sectors, which can replace large quantities of chemical fertilisers

Disadvantages of composting:

- odours are likely to occur, at least in the first phase of the process; composted products often give off unpleasant odours, especially if they are stored for some time before the process starts
- weather can affect or prolong composting; cold and wet weather can prolong the composting process by reducing the temperature in the compost heap and increasing the humidity; snow in large quantities and in the long term can even block the composting process;

The steps of the composting process are:

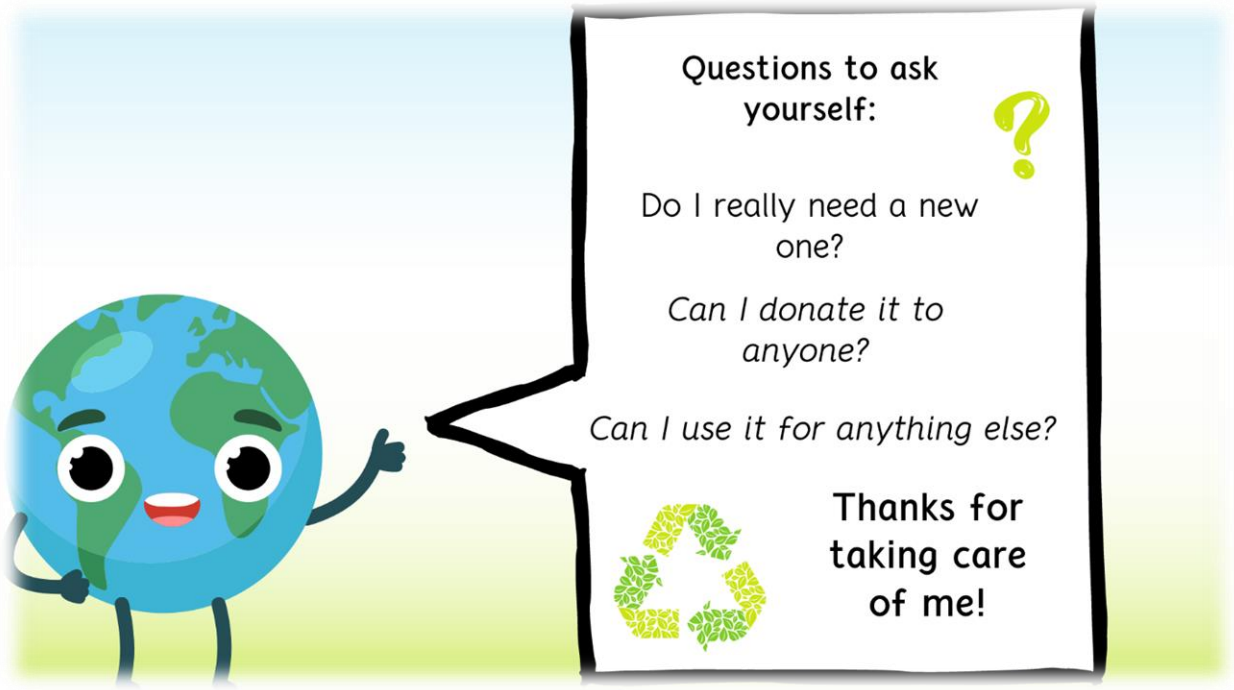
1. Collect all biodegradable and vegetable waste from the household: fruit and vegetable scraps, eggshells, flowers, branches, grass, straw, hay, twigs. Remember to separate these types of waste from other waste.

2. Place a 10-15 cm layer of broken branches or other garden waste at the bottom of the composter.
3. Alternate a layer of biodegradable waste with a layer of dry garden soil.
4. Use the finished compost as a natural fertiliser.

4.2. 🌳 Pocket tips:

- Turning off the light. The easiest and quickest pocket tip is just a press away. Using natural light as much as possible and checking when leaving the room that the light has been turned off is a plus in protecting nature.
- Replacing plastic bags with cotton or alternative materials such as compostable, biodegradable or reusable bags
- Turn off the tap when washing your hands
- Unplug electronics when not in use
- Buy LED light bulbs
- Turn off the tap when using soap
- Replace plastic containers with reusable or biodegradable materials.
- For a quick organic "diet", glass jars, for example, can be a good replacement in the kitchen for plastic containers for rice, peas, beans, sugar, salt, etc.
- Replacing plastic utensils with metal or bamboo ones. They are in most of our homes and are a small but impactful action to protect the environment.
- Replace personal hygiene products with their natural equivalent. There are more sustainable alternatives for all the usual products: sponge, toothpaste, razor, soap, deodorant. These can often be found at the same price or cheaper than those normally used. This represents a major change in anyone's home and life. A first step to buying such products would be to replace their containers with glass or metal ones (for example, a metal holder can be used for toothbrushes or soap).
- Support local producers or use their own crops. Natural products from producers are prepared with care for nature and packaged appropriately so that they are packaged with bio-degradable or reusable materials.
- Buy food according to how much you know you will consume (As a little trick, never go to the shop before eating or when you are hungry, then you will tend to buy more)

- Avoid burning waste in the open and use special waste disposal areas. The risks are huge, from starting fires that can spread to destroying land and vegetation. The waste we generate by burning can also become toxic to humans and nature..



4.3. 🌳 Support group for a green community.

Great change starts with each individual, but for lasting change to happen, these actions must be perpetuated at the community level. The group is a force for lasting change. Each member of the community is responsible for taking action in their area to protect the environment by implementing the 3Rs and the Pocket List. Examples of good practice are passed on from generation to generation, among friends, family members even where there are people who are not aware or have not yet realised the impact of their actions on the environment. One person in a locality cannot succeed in changing the whole group and there is a risk that the efforts they make, on a large scale, will not be visible (e.g. one person throws rubbish in the bin, 10 others throw rubbish in the bin). But one person can set an example and others can follow so a group can help a whole community.

Neighbours, friends, acquaintances can help each other with clean community measures by following a simple list of community measures:

1.When in public space, do not litter, look for the nearest bin (e.g. cigarette butts, packaging etc.).

2. If they find rubbish on the ground, pick it up and take it to the special areas in the village.

3. Introduction of group thinking: Lines such as "I won't pick up someone else's rubbish", "Let them come and pick it up" are not in favour of the common cause, the important thing is to protect the environment.

4. For disadvantaged or elderly people, support should be offered for recycling, collection, disposal (e.g. an older neighbour can be helped by a younger family and when they have to dispose of larger and bulky items they should be physically supported).

5. Joint decisions. These are especially good for special category waste. Some involve certain costs, so neighbours or friends can get together and on a mutually agreed day call the relevant institutions or transport certain waste to them.

6. Community outreach and information. If it is observed over a longer period of time that certain members of the community are not coping with the recycling rules, they should be informed and helped by members who know (Observation is the key, from the smallest examples such as: neighbour X always keeps the light on continuously, to the biggest: a family is not able to transport its waste in special categories; other members can: help, ask and inform).

7. Cleaning up animal waste. Special bags can be used to clean up the physiological needs of pets in public areas and then dispose of them in the appropriate places.

8. Inform and donate. Clothes or certain objects can be a valuable asset for other members of the community. Ask if there are people in your area who need them. Possibly organise donation days with a larger group.

9. Give up uncontrolled fires for waste disposal, a solution would be point number 5 for an action in the interest of nature

10. Stop "communal" dumps (throwing rubbish at the end of the village, in small streams, in wells).

Good habits run in the family. Children follow their parents' example and they in turn carry on the habits of a green community. The older generation has the experience and wisdom to put certain measures into practice. Also, the grandparents' generation have been able to see how nature has changed (from the climate to the level of agriculture) otherwise the younger generation can teach them and explain what they can do as individuals to help against environmental degradation. A family that maintains healthy principles is an example to an entire community.

11. Organic habits for families:

- parents to start small actions that children take up naturally (e.g. sorting waste into different containers)
- parents to promote an organic mentality focused on actions not consumption (involve children or all family members in shopping to buy as much as needed to promote a healthy mentality)
- the younger generation to engage in interaction with the elderly and explain 3R-type actions (e.g. throwing plastic bottles away separately after they have been pressed)
- promote habits such as turning off lights, washing clothes when the car is full, unplugging appliances when not in use.
- use alternative modes of transport as much as possible, e.g. bicycles. Nature walks are also good for both physical and mental health and for creating a relationship with nature. Avoid transport if possible in favour of walking.

🌎**Green week for an organic community!**

As big changes start with small steps, Green Week is a prime example that can easily be adopted by any family:

Monday- electricity consumption day (check if you have turned off your light bulb, buy LED bulbs, unplug appliances when not in use)

Tuesday - buy from local producers (these can be your neighbours who can offer you healthy and quality products)

Wednesday - donation day (donate clothes you don't use or items you no longer need to a family in need)

Thursday - reorganisation day (give up disposable items such as plastic straws)

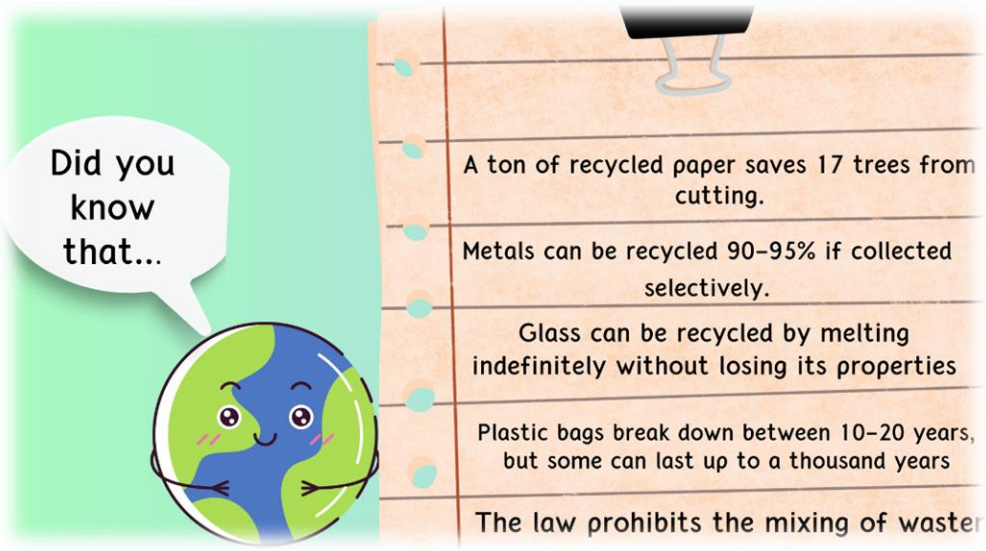
Friday - special waste day (collect special waste items together with neighbours and inform an accredited company to come and collect them; also collect batteries and electronics you no longer use and take them to special collection points - some are even in supermarkets)

Saturday - replace plastic shopping bags with biodegradable or cotton ones

Sunday - election day. You can choose one, two or all three: a) paper, b) plastic, c) glass. Clear out the house if there are any items left from the 3 categories and sort them in the right place. For example, if there are papers left around the house that are not useful, tear or cut them up and put them in the appropriate bin.

Did you know:

- One ton of recycled paper saves 17 trees from being cut down
- Glass can be recycled by melting indefinitely without losing its properties. It also costs less to recycle than producing glass from raw materials, saving energy.
- Plastic bags decompose in 10 to 20 years, but some can last up to a thousand years.
- Metals are 90-95% recyclable if collected separately.
- Some metals, such as aluminium, can be recycled indefinitely.
- The law forbids the mixing of residues



CHAPTER 5: ENVIRONMENTAL PROTECTION

5.1. Environmental Protection in Cyprus

The Republic of Cyprus as a Mediterranean island is highly sensitive in the Environmental Protection at all levels and has throughout the years developed several policies and strategies that will confront the challenges. Cyprus, just like the rest of the world, is facing challenges as a result of the environmental problems across the world, with the degradation of natural resources to be a major problem, causing serious concerns about the quality of life and the future prospects that can harm the prospects of younger generations to develop their lives in a more sustainable manner.

The actions of the Republic of Cyprus are mainly directed towards five specific Pillars:

i. Informing the public and organisations about the role of Environmental Protection in the Quality of life in order to ensure that they will be engaged in the actions developed by the national authorities. Informing is essential in order to ensure that all the public will be aware of the issues
ii. Preservation of the natural resources through the use of the available human and technological assets. The preservation is developed by several actions in areas that are considered as vulnerable, and the participation of the public, especially in vulnerable areas is considered as of a primary importance
iii. Engagement of the maximum number of people and organisations in this procedure in order to ensure that they will maximise the potentials and create synergies for future development. This will also increase the overall capacity in case of emergencies.
iv. Recovery and Restoration of the areas that have been damaged in previous natural and human-interaction catastrophes. Specific areas are facing serious problems that need to be protected from future problems, as in the past there have been serious environmental damages as a result of extensive bushfires.
v. Cooperation with the relevant bodies of the EU. The EU possesses the appropriate infrastructure and the legal framework that can support a small country like Cyprus in order to acquire know-how. This also enables the

cooperation with other EU member-states, especially in the Mediterranean region.

Some of the actions undertaken in the Republic of Cyprus are:

- The Ministry of Agriculture, Rural Development, and the Environment has developed a comprehensive Environmental Strategy that has been approved by the Cabinet. The Strategy is considered to be the most comprehensive and focuses on treaties such as the Protection of Endangered Species of Flora and Fauna; Barcelona for the Protection of the Mediterranean, the Basel for the Cross-Border Transport of Hazardous Waste, and the Vienna and Montreal Protocol on Substances that Deplete the Ozone Layer.
- Adjustment of the national Laws to the relevant Directives and Regulations to those of the EU.
- Extensive information to the children of all ages in order to increase their awareness. Several speeches and presentations including the World Environmental Day (5^{th} of June) are directed towards the protection of the environment. Activities such as planting occur in seriously damaged areas, as a result of serious bushfires.
- The Episkopi Environmental Information Centre (EEIC) constitutes a pioneer project that has been developed with funds by the Government of Cyprus and the EU. EEIC is a Non-profit Organisation that enables visits in a unique natural environment that extends to an area of over 20km². The EEIC focuses on highlighting, promoting and protecting the ecological and cultural characteristics of the Ezousa Valley.
- Incentives by the Government of Cyprus to the Higher Education Institutions (Universities) in order to develop programs, undergraduate and postgraduate, that will be able to attract more students towards Green degrees and sustainable jobs.
- Planting and Protection activities, with the participation of young entrepreneurs.
- Incentives for adoption of new IT in order to decrease Energy Consumption.
- Reducing the environmental impact on and around construction sites.
- Incentives for Waste Management with Green Dot.
- Incentives for improves Water Management

- Incentives to Businesses for friendly environmental management

References

Episkopi Environmental Information Centre (2022). *Welcome to Episkopi Paphos Environmental Information Centre.* http://epeicentre.com
Green Dot (2022). *Living well.* https://greendot.com.cy
Ministry of Agriculture, Rural Development, and the Environment (2022). *Department of Environment* https://moa.gov.cy

5.2. Environmental Protection in Romania

a. Introduction

Environmental protection legislation in Romania includes the framework law on environmental protection, the environmental fund and regulations on environmental information management, environmental regulations containing updated regulations for obtaining environmental opinions, agreements and permits, as well as regulations on the preparation of environmental studies; Pollution control, seveso, chemicals including regulations concerning industrial pollution, chemicals legislation and risk management; Waste - general waste legislation and some more important legislation regulating special waste streams (packaging, tyres, DB&A, WEEE, waste oils, medical waste), Water - containing the Water Act and technical regulations NTPA 001 and NTPA 002 setting, inter alia, the maximum allowable concentrations for waste water discharges into municipal sewerage networks and surface water courses are included in this section; Atmospheric protection - legislation in the field of atmospheric protection is generally included in other sections (e.g. Pollution control - with legislation on industrial emissions); and Biodiversity - general biodiversity legislation is covered.

The area covered by this project is waste, which includes the sub-domains: waste management includes waste transport, waste landfill, waste incineration, sewage sludge, end-of-life vehicles, packaging and packaging waste, waste oils, waste electrical and electronic equipment, hazardous substances in electrical and electronic equipment, waste batteries and accumulators, waste from the extractive industries and sanitation.

New legislation in 2021 that can increase waste recycling, separate collection and recycling of waste. In August, the Government Emergency Ordinance (GEO) No 92 was adopted, repealing Law 211/2011 which has a recycling target of 50% of all waste generated by the population - by 2020 - was not even close. It must ensure that a minimum of 50% for paper, metal, plastic and glass household waste is prepared for reuse and recycling. At the same time, biodegradable waste (bio-waste) must be collected separately or recycled at source (by composting) from 2024. From 2025, the obligation to separately collect textiles and hazardous waste from households is introduced.

According to GEO 136/2021, the percentage of municipal waste going to landfill should be 60%. Of this percentage, a minimum of 50% of waste should be recycled and another 10% should undergo other forms of recovery (e.g. energy recovery through incineration). Romania recycled 11.5% of all waste generated in 2019.

The Government Ordinance on reducing the environmental impact of certain plastic products also came into force at the end of August. It transposes into Romanian law the EU Directive on single-use plastic

The most important provision of the ordinance is the ban on the following plastic products: chopsticks, cutlery (forks, knives, spoons, chopsticks), plates, straws and stirrers for drinks, sticks that attach to or support balloons, food containers made of expanded polystyrene (boxes with or without lids for food intended for immediate consumption or take-away), beverage containers and glasses made of expanded polystyrene, including stoppers and lids.

b. Guarantee-return system from October 2022

The legislative framework allowing the adoption of the guarantee-return system was adopted in October. The legislation establishes a 0.50 lei guarantee for any package of drinks purchased. The amount will be recovered when used packaging is returned to stores - supermarkets or small shops - and could operate from 1 October 2022.

This method has already been successfully applied in several European countries, such as Germany, the Netherlands, Croatia, Estonia and Lithuania.

The Recycling Map is a project initiated in Bucharest and is the first national, participatory and educational platform to which the community contributes in order to publicise separate collection sites in the country. The common goal is to promote the reduction, reuse and recycling of waste of all kinds, from paper, plastic, metal to household appliances, tyres, hazardous waste and more.

There are also non-governmental associations that start projects for different age groups. One example is the Anima Verde Association in Oradea. It is a non-governmental organisation that supports environmental education for children with the support of local partners. Through their projects, children learn about selective collection, recycling and reuse of waste. The project was started in 2019 out of a desire to support the Eco educational process in schools. Anima Verde promotes through its actions the circular economy, a production and consumption model that involves sharing, reusing, repairing, renovating and recycling existing materials and products as much as possible. It organises practical workshops on sorting, recycling and reuse where students can better understand the transformation of waste. In these workshops children have the opportunity to reuse waste plastic, wood, metal, textile, rubber and transform them into garden or indoor furniture, decorative objects or holiday ornaments.

Together for a responsible community

Co-funded by the European Union

Erasmus+ Programme - Small-Scale Partnerships
Project: "Together for a responsible community"
2021-2-R001-KA210-ADU-000048442