SUSTAINABLE FUTURE: GREEN SKILLS FOR THE CIRCULAR ECONOMY

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Contents

1 INTRODUCTION (ANAGLYFO):

This manual was developed as part of our collaborative training program on green skills and sustainable development. Its purpose is to provide participants, educators, and practitioners with a structured resource that combines theory, practical tools, exercises, and additional learning materials across a range of sustainability-related topics.

The manual reflects the shared vision of our organizations to equip young people, professionals, and communities with the knowledge and competencies necessary to respond to the urgent challenges of climate change, resource scarcity, and environmental degradation. It highlights not only individual practices but also systemic approaches, connecting personal choices with community initiatives, business strategies, and policy frameworks.

Special attention is given to the role of digital skills in shaping the development of youth. In an increasingly digital world, the ability to use technology responsibly and effectively is essential for advancing sustainability goals. Digital competencies — such as navigating online learning platforms, analyzing environmental data, or promoting eco-initiatives through social media — enable young people to access knowledge, innovate, and connect with global networks. By combining green and digital skills, youth can become more adaptable, entrepreneurial, and prepared for the labor market of the future, while also contributing to sustainable solutions at both local and international levels.

Each chapter addresses a specific theme, beginning with overarching concepts such as sustainability and moving into applied areas including renewable energy, waste management, eco-friendly practices, and green skills in agriculture, production sectors, and waste management. The manual also explores sustainable practices at the organizational and policy level, showing how long-term strategies complement daily actions.

Every chapter is structured in four parts: Theory, to explain the key ideas and frameworks; Practical Tools, to demonstrate how concepts are applied in real contexts; Exercises, to encourage active participation and reflection; and Additional Learning Resources, to guide further exploration.

The manual is designed not only as a training resource but also as a practical guide that can be used by individuals, educators, businesses, and community groups seeking to adopt greener practices and build capacity in the transition to a sustainable future.

2 SUSTAINABILITY (ReSEES)

2.1 Theory

The United Nations define sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Several approaches to sustainability were discussed, encompassing the European Green Deal, the Sustainable Development Goals (SDGs), the utilization of renewable energy sources, the principles of a circular economy and sustainability, advancements in technology and digital skills, as well as the development of green competencies.

Participants were introduced to the Sustainable Development Goals (SDGs) agenda, which for the first time establishes "universal" goals that all countries are called upon to implement, regardless of their level of development.

SDGs aim to achieve economic development that guarantees social well-being without exclusion and to protect the environment and natural resources for the benefit of both present and future generations. They have been meticulously designed to be interlinked, thereby creating an indivisible system. This interconnection underscores the interaction of goals, where each objective can either enhance or undermine others; for instance, the promotion of sustainable agricultural practices (SDG 2) can significantly contribute to poverty reduction (SDG 1) and improve health outcomes (SDG 3). However, it is essential to consider the conflicts and challenges that may arise, as certain actions taken to achieve one goal could have negative repercussions on others. A pertinent example is the industrialization of agriculture, which may enhance productivity (SDG 2) but could simultaneously adversely affect biodiversity (SDG 15).

The concept of a circular economy was discussed in detail. This approach offers a novel approach to resource management, wherein raw materials are retained in circulation for as long as feasible, rather than being discarded. This model contrasts with the traditional linear system of production and consumption by emphasizing the elimination of waste and the preservation of product value. Such an approach aids in the conservation of primary resources, minimizes waste generation, and fosters economic value, thereby providing a sustainable solution to contemporary challenges associated with excessive material and energy consumption (Prague City Council, 2022).

References:

- United Nations. (2025). Sustainable Development Agenda. Retrieved from https://www.un.org/sustainabledevelopment/development-agenda-retired/
- Prague City Council. (2022). Circular Prague 2030: Strategic framework for circular economy development in the capital city.
- United Nations. (2025). *The 17 goals*. Retrieved from https://sdgs.un.org/goals
- Υπουργείο Περιβάλλοντος και Ενέργειας. (2025). *Στόχοι βιώσιμης ανάπτυξης ΟΗΕ*. Retrieved from https://ypen.gov.gr/stochoi-viosimis-anaptyxis-oie-sustainable-development-goals-sdgs/
- UIA. (2025). *17 SDGs*. Retrieved from https://www.uia-architectes.org/en/commission/17-sdgs/

2.2 Practical tools

Participants were introduced to practical guides on sustainability and methods for measuring their carbon footprint. The selected tools were designed to be practical, utilizing straightforward language and visual cues to facilitate independent understanding and usage by the participants.

Some examples are the following:

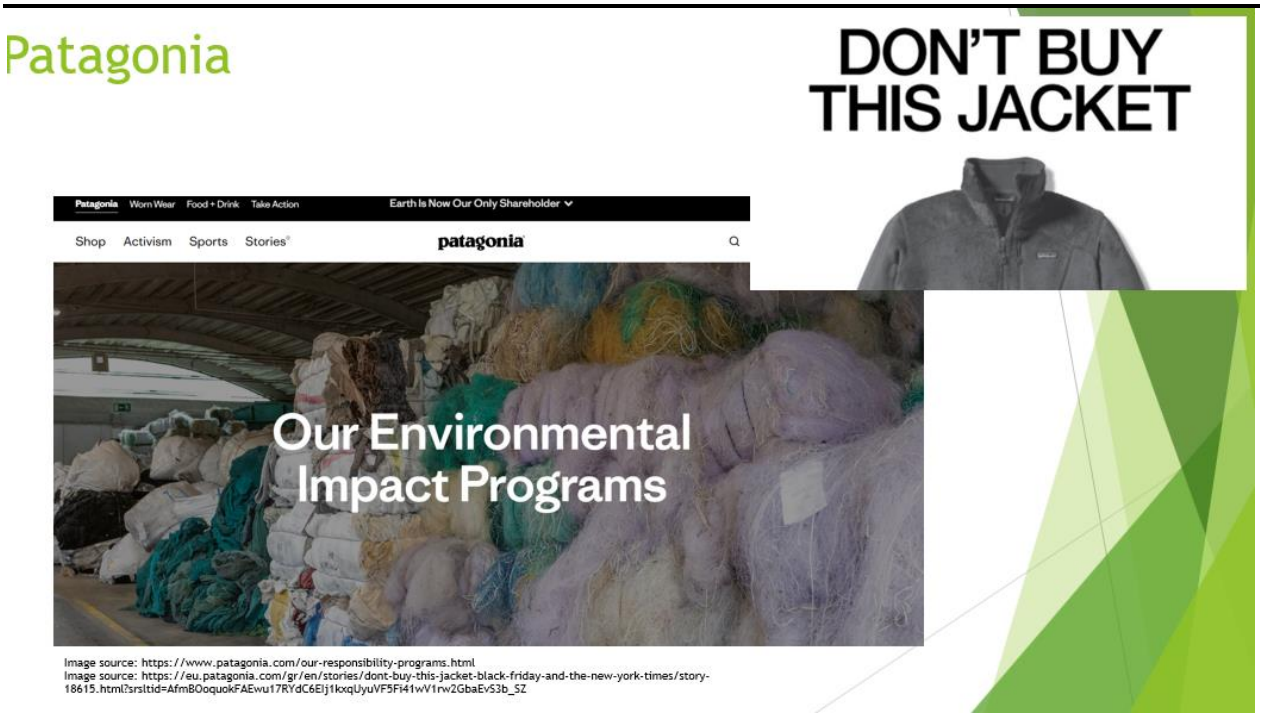
https://www.incommon.gr/praktikos-odigos/kleise-ton-kyklo-2

https://climateacademy.gr/carbon_footprint/

- **Refuse:** to buy products that you don't really need.
- **Reduction:** Use fewer products.
- **Reuse:** Use again, exchange, think of different ways to use, avoid single-use products.
- **Recycling:** Recycle, buy products made from recycled materials.
- **Recover value-Composting:** Make your own fertilizer, do composting.

nage source https://www.antigone.gr/wp-content/uploads/news/gr/%CE%9A%CE%91%CE%9C%CE%95-%CE%9F%CE%94%CE%97%CE%93%CE%9F%CE%A3-%CE%93%CE%99%CE%91-%CE%A0%CE%91%CE%99%CE%94%CE%99%CE%91.pdf

Image source: https://www.wastenothing.co.nz/our-zero-waste-journey/waste-hierarchy/



2.3 Exercises

Participants were invited to engage in open-ended discussions centered on sustainability practices in their daily lives, fostering a collaborative environment where ideas could flourish. They were encouraged to reflect on actionable changes by answering prompts such as, "List three things you could change on a personal level in your daily life," which invited them to consider small yet impactful shifts in their routines. Another prompt, "Can you mention one way to reduce waste in your home?" sparked conversations about practical strategies for minimizing waste, from composting to mindful purchasing. Discussions also delved into water conservation, with participants exploring the question, "How can we save water in our daily lives?" This prompted innovative suggestions ranging from simple habits like shorter showers to more sustainable landscaping practices. Furthermore, the discussion on "What are some easy ways to recycle?" encouraged attendees to share their experiences and tips on making recycling more efficient and accessible. Through these open-ended questions, participants not only discovered new ideas but also inspired each other to take meaningful steps toward sustainable living.

1. List 3 things you could change on a personal level in your daily life.

2. Can you mention one way to reduce waste in your home?
3. How can we save water in our daily lives?
4. What are some easy ways to recycle?

2.4 Additional learning resources

To further support participants in their exploration of sustainability practices, we provided a range of user-friendly online resources designed to enhance their understanding and application of sustainable living principles. These resources included curated links to interactive websites and informative materials, such as the comprehensive Greek Handbook for CE Transition for Tourist Providers, which offers valuable insights for those in the tourism sector. Participants were also directed to Circular Greece, a platform that connects individuals and organizations committed to circular economy practices. Additionally, the Dio Pigadia website provides local insights and resources for sustainable

initiatives, while Youth.europa.eu offers articles and involvement opportunities specifically tailored for youth interested in sustainable development. By equipping attendees with these valuable tools, we aimed to empower them to make informed decisions and foster a deeper commitment to sustainability within their households and communities.

https://dio-pigadia.com/el/%CE%BA%CE%B1%CE%BB%CF%8E%CF%82-%CE%AE%CE%BB%CE%B8%CE%B1%CF%84%CE%B5-%CF%83%CF%84%CE%B1-%CE%B4%CF%8D%CE%BF-%CF%80%CE%B7%CE%B3%CE%AC%CE%B4%CE%B9%CE%B1/

https://circulartourism.eu/wp-content/uploads/2021/05/GREEK-Handbook-CE-Transition-for-Tourist-Providers_GR.pdf

https://circulargreece.gr/el/etairoi/

https://youth.europa.eu/get-involved/sustainable-development/articles_el

Patagonia. Retrieved from https://www.patagonia.com/home/

3 RENEWABLE ENERGY (Anaglyfo)

3.1 Theory

Participants were introduced to the concept of renewable energy as energy derived from natural processes that are replenished constantly, unlike fossil fuels which are finite and heavily polluting. The discussion covered the main types of renewable energy, such as solar, wind, hydropower, biomass, geothermal, and marine energy. Each type was analyzed in terms of its potential, its applications, and the challenges associated with scaling it up. For example, solar and wind energy were highlighted as rapidly expanding technologies with decreasing costs, while hydropower was recognized as a more traditional source, often limited by geographical conditions. Biomass and bioenergy were introduced as significant for agricultural regions, offering ways to convert organic waste into usable energy.

The training also explored how renewable energy is increasingly integrated into new business models. Startups and small enterprises are seizing opportunities to design innovative services such as rooftop solar installations, renewable-powered farming operations, and biogas production from agricultural waste. Participants were encouraged to view renewable energy not only as an environmental necessity but also as a business opportunity that can create green jobs and local economic value. Community-based renewable energy initiatives, such as cooperatives that share the costs and benefits of solar farms, were discussed as examples of how collective action can democratize energy access.

The benefits of renewable energy were emphasized, including its contribution to reducing greenhouse gas emissions, mitigating climate change, and improving air quality. On a socio-economic level, renewable energy creates local jobs, fosters innovation, and reduces reliance on imported fossil fuels, which strengthens energy security. However, participants also reflected on the challenges of implementing renewable energy in practice. These include the intermittency of solar and wind power, the need for advanced storage solutions, the high upfront investment costs, the lack of skilled personnel in some regions, and occasional public resistance to new energy infrastructure.

Finally, government policies and institutional frameworks were introduced as critical factors in accelerating renewable energy adoption. Participants learned about policy instruments such as feed-in tariffs, renewable portfolio standards, tax incentives, net metering, and grants that support households and businesses in transitioning to cleaner energy. The European Union's renewable energy directives were presented as an example of how long-term, stable targets can create investor confidence, while national subsidy schemes were

shown to help make renewable energy accessible to households and communities. This section highlighted that while technology is vital, supportive policies and community initiatives are equally necessary to achieve the energy transition.

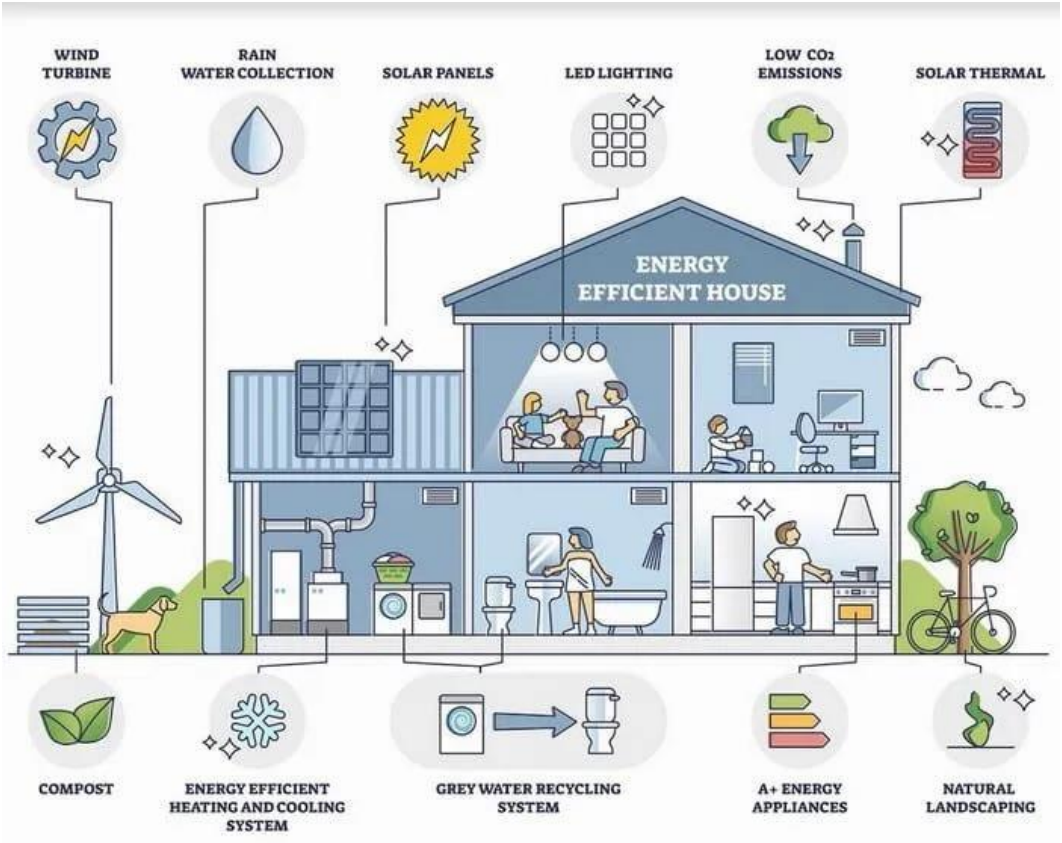
3.2 Practical tools

To help participants connect theory with practice, we incorporated a variety of interactive and visual learning tools during the training. Visual images and infographics were used to illustrate how different renewable energy systems operate, such as the conversion of sunlight into electricity through solar panels or the generation of energy from wind turbines. Real-life scenarios and case studies were presented, showing how households, businesses, and even whole communities have successfully adopted renewable energy. These stories allowed participants to see the tangible impact of renewable energy on people's daily lives, from reducing household electricity costs to creating new green jobs.

Short videos and animations were also shown to make complex processes more accessible. For example, one video explained how a biogas plant works by turning agricultural waste into energy, while another demonstrated the operation of community-owned solar projects in Europe. These resources made the topic more relatable and encouraged participants to imagine how similar initiatives could be implemented in their own regions.

To complement the visual material, we shared relevant reports and guides that provide deeper insights into renewable energy practices and methods. One particularly useful resource was the International Renewable Energy Agency's (IRENA) "Renewable Energy and Jobs – Annual Review", which outlines global trends, opportunities, and case examples of renewable energy in different sectors. Another was the European Commission's "Renewable Energy Progress Report", offering detailed analysis of EU member states' achievements and challenges in meeting renewable targets. By exploring these documents, participants were able to link their local discussions with international strategies and best practices, reinforcing the importance of renewable energy in both community initiatives and broader policy frameworks.

https://www.csemag.com/five-best-practices-for-integrating-renewable-energy-in-commercial-building-design/



https://www.alternative-energies.net/7-sustainable-practices-for-household-energy-consumption/

3.3 Exercises

Participants took part in interactive conversations focused on how renewable energy could be applied in their everyday routines. These dialogues created a supportive space for exchanging perspectives and building on each other's ideas. They were guided to think about practical steps they could personally take by responding to questions such as: "What renewable energy sources seem most viable in your local area, considering the climate, geography, and available infrastructure?" These conversations helped them to identify realistic opportunities close to home, such as rooftop solar panels, small-scale wind turbines, or biogas systems using agricultural waste.

Participants then worked in small groups to map possible sites for renewable energy deployment in their communities. Rooftops, open fields, and areas with organic waste were identified as practical starting points. Building on this, they collaborated to draft mini business plans for a startup or cooperative focused on renewable energy. The exercise required them to outline potential revenue streams, costs, key stakeholders, and possible financing strategies. Each group presented their draft plan, highlighting both strengths and potential risks, and received feedback from peers.

To deepen the personal relevance of the training, a reflection activity was conducted in which participants were asked: "If I were to install a renewable energy system at my home, business, or community, what would it be and why? What obstacles would I face?" This exercise encouraged them to critically assess financial, technical, and social barriers they might encounter. Finally, they concluded by listing three concrete actions they could take to promote or support renewable energy in their area, such as joining a community energy initiative, advocating for subsidies, or exploring ways to integrate renewable systems into their work or daily routines.

3.4 Additional learning resources

To continue their learning journey, participants were provided with a curated set of resources that combine technical knowledge, policy guidance, and practical case studies. The International Renewable Energy Agency (IRENA) offers comprehensive reports and data on global renewable energy trends, while the European Commission's Energy portal provides up-to-date information on EU renewable energy policies and directives. For practical applications, tools such as the PVGIS Solar Calculator and the Global Wind Atlas were recommended to help participants assess local renewable energy potential.

Participants were also encouraged to explore resources on community-led projects, including case studies from Earth.Org on local energy communities and reports from Columbia University's Center on Sustainable Investment on benefit-sharing policies in renewable energy. Additionally, a study on how Greek citizens view renewable technologies, their acceptance, and obstacles from a social perspective was recommended. By engaging with these resources, participants were encouraged to continue exploring renewable energy as both an opportunity for sustainable living and a driver of green innovation in their communities.

4 WASTE MANAGEMENT (ReSEES)

4.1 Theory

During the training on waste management, the following key points were introduced: the European Green Deal (EGD) and Waste Management; the hierarchy of waste management; the Framework Directive; the EU Waste Management and Circular Economy policy; the importance of green skills in waste management; Greece's goals and new projects; and the significance of packaging.

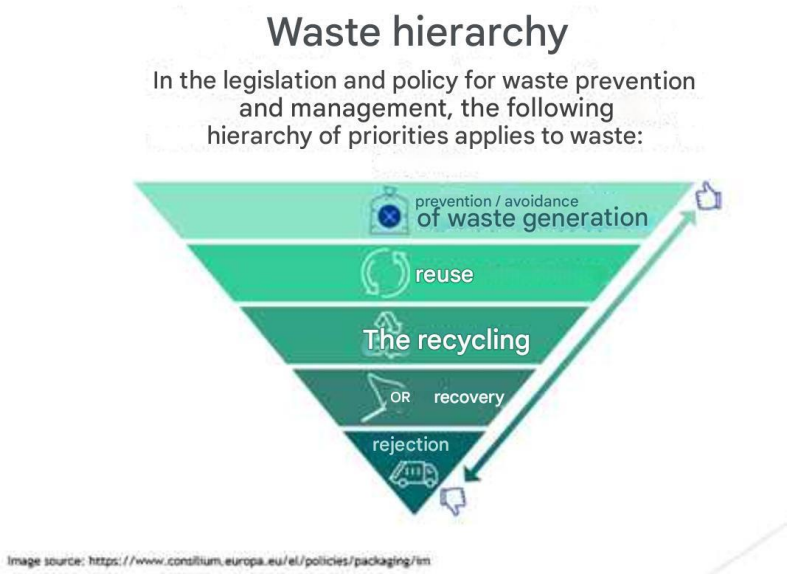
The concept of waste hierarchy was highlighted. Waste hierarchy serves as a prioritized framework in legislation and policies related to waste prevention and management. It forms the fundamental basis of waste policies and legislation within the European Union (EU), as established in the EU Waste Framework Directive. Its dual objectives are to reduce the negative effects associated with waste generation and management while enhancing resource efficiency.

References:

Eur-Lex. (2025). *Waste hierarchy*. Retrieved from https://eur-lex.europa.eu/EN/legal-content/glossary/waste-hierarchy.html#:~:text=The%20hierarchy%20is%20generally%20depicted,resort%20solution%20to%20managing%20waste.

4.2 Practical tools

Numerous visual images, real-life scenarios, and video aids were employed to elucidate waste management techniques, enhancing participants' understanding and engagement with the topic. These multimedia resources provided practical examples of effective waste management practices in action, allowing attendees to visualize the impact of recycling, composting, and proper disposal methods. For instance, the Elaionas Project offered insights into sustainable waste management strategies through compelling visuals and case studies that highlighted successful initiatives. By incorporating these diverse aids, we aimed to create a more interactive learning experience, enabling participants to grasp complex concepts and apply them in their own lives.



https://elaionasproject.gr/wp-content/uploads/2023/12/elaiwnas-project.pdf

4.3 Exercises

The participants were invited to engage in a quiz as part of the waste management unit, designed to reinforce their understanding of proper recycling practices and encourage

responsible waste disposal behaviors. One of the quiz questions focused on the correct disposal of old batteries, asking, "Where should old batteries be recycled?" The answer choices included: "In the trash bin," which highlights a common misconception; "In a sealed bag placed on top of recycling bins for collection by the recycling driver," emphasizing a more responsible approach; and "At specialized battery recycling centers," which is the most appropriate method for ensuring safe and effective recycling of hazardous materials. Another question addressed the recycling of electronic waste, such as old televisions, computers, and CDs, posing the question, "Where can you recycle electronic waste like old televisions, computers, and CDs?" Participants were given several options, including "In the black bin," which typically indicates general waste; "On the sidewalk," implying improper disposal; "By delivering items to a special electronic waste recycling bin," which promotes responsible recycling; and "All of the above," encouraging critical thinking about the various disposal methods available. Through this interactive quiz format, participants not only tested their knowledge but also deepened their understanding of the critical importance of proper waste management practices. The quiz served to highlight common misconceptions and educate individuals on how to make informed choices in their daily lives, ultimately fostering a culture of sustainability and environmental responsibility.

4.4 Additional learning resources

To further enhance their understanding of waste management and packaging practices, participants were provided with a selection of additional online resources that are both informative and accessible. These resources included comprehensive guides and interactive platforms that delve into various aspects of waste management and sustainable packaging solutions. For instance, the Tessera Products website offers insights into the benefits of choosing eco-friendly packaging products, emphasizing the importance of selecting materials that minimize environmental impact. Additionally, participants could explore the Greek Biobag Compostable site, which provides information on compostable bin liners and their role in reducing plastic waste, showcasing practical alternatives for everyday use. The Hatzopoulos website further offers a variety of sustainable packaging solutions, highlighting innovative approaches to packaging that align with eco-friendly practices. By equipping participants with these valuable tools, we aimed to empower them to take actionable steps toward better waste management and responsible packaging choices, ultimately fostering a stronger commitment to sustainability within their communities.

https://www.tesseraproducts.com/viodiaspomena-proionta-syskevasias-logoi-na-ta-epilegete/

https://greek.biobagcompostable.com/supplier-4417047-compostable-bin-liners

https://hatzopoulos.gr/packaging-solutions/#

5 ECO-FRIENDLY PRACTICES (Anaglyfo)

5.1 Theory

During the training, participants were introduced to the concept of eco-friendly practices as everyday choices that reduce harm to the environment, conserve resources, and encourage more sustainable patterns of consumption. The discussions highlighted how small changes in daily habits can collectively make a significant difference in reducing carbon emissions, minimizing waste, and promoting healthier lifestyles.

Food practices were a central focus. Participants reflected on the importance of consuming local and seasonal produce, both for reducing transportation emissions and for supporting local farmers. They were encouraged to think critically about food waste by purchasing only what they truly need, storing food properly, and avoiding unnecessary packaging. For instance, the simple example of not buying strawberries in winter was used to illustrate the environmental footprint of importing out-of-season produce.

The clothing sector was another area of emphasis. Participants explored how extending the life of garments—by repairing, reusing, swapping, or buying secondhand—can substantially lower the environmental footprint of fashion. They were also introduced to eco-labels and certifications that indicate responsible production, such as garments made from recycled materials or textiles manufactured under fair labor and environmentally conscious standards.

Transportation habits were discussed as a major factor in environmental impact. The training highlighted practical alternatives, such as using bicycles or public transport for daily commuting, choosing trains instead of planes for regional travel, and practicing fuel-efficient driving. These shifts not only reduce carbon emissions but also promote healthier lifestyles.

Energy and water conservation were addressed through simple yet impactful behaviors. Lowering heating by even one degree, shortening shower times, turning off water when brushing teeth, and unplugging appliances when not in use were discussed as easy, cost-saving actions. Participants were also introduced to the concept of a digital footprint, learning that storing unnecessary data in the cloud consumes energy in data centers. Choosing energy-efficient products with the EU “A” label was promoted as a smart consumer habit that combines environmental and financial benefits.

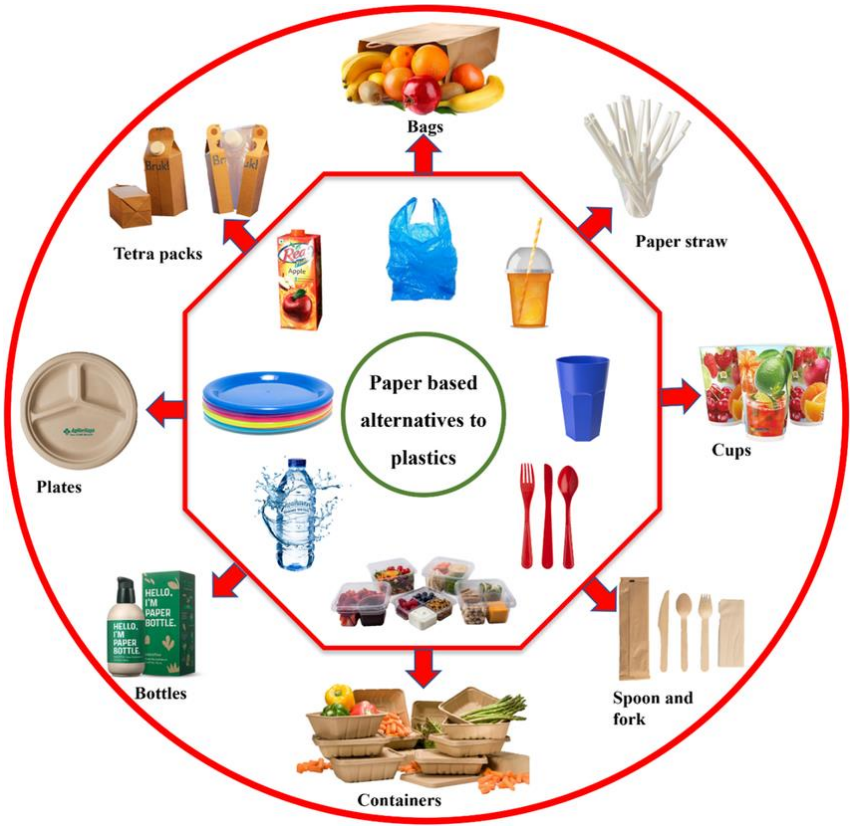
Another important area covered was sustainable packaging. Participants examined biodegradable alternatives such as cornstarch, mushroom-based packaging, and

bioplastics, which decompose naturally and reduce pollution. They also discussed the advantages of reusable packaging systems, where containers are used multiple times, saving costs and minimizing waste. The training stressed recyclable packaging options such as cardboard, PET plastics, and metal cans, showing how these materials can be looped back into production cycles to support the circular economy. Businesses were also highlighted as key actors, able to design eco-friendly packaging, optimize supply chains, and engage consumers through clear labeling and communication about sustainable choices. Participants recognized that consumer awareness is growing, and that brands adopting greener packaging often enjoy increased loyalty and trust. Finally, the training emphasized the role of regulatory compliance, with governments requiring recyclable materials, transparency in labeling, and adherence to waste-reduction standards as part of broader environmental strategies.

5.2 Practical tools

To make eco-friendly practices more tangible, participants were supported with engaging and relatable tools. Visual images and infographics were used to demonstrate the life cycle of products—from raw materials to disposal—helping participants see how their choices influence the entire chain. Real-life scenarios were presented, such as households that cut food waste in half by planning meals carefully, or businesses that reduced their costs by adopting reusable packaging. Short videos provided additional inspiration, including examples of community clothing swaps, innovative biodegradable packaging, and families that successfully transitioned to zero-waste lifestyles.

To complement these visual and practical examples, participants were provided with key reports and guidelines. A particularly useful resource was the EU Circular Economy Action Plan, which outlines European strategies for reducing waste and promoting reuse. At a regional level, they were introduced to initiatives such as the Just go Zero (Polygreen) platform and Cyprus's Department of Environment guides on sustainable consumption, which provide concrete methods and local case studies for adopting eco-friendly habits. These resources offered participants both inspiration and practical pathways to implement what they had learned.



https://www.researchgate.net/figure/Biodegradable-paper-based-alternatives-to-the-commercially-available-non-biodegradable_fig1_363246328

https://ekolojist.net/en/biodegradable-definition-examples/

5.3 Exercises

Participants were invited to engage in hands-on and reflective exercises that encouraged them to link eco-friendly practices to their own lives. In group discussions, they brainstormed ways to reduce food waste, with prompts such as: *"What small changes in your household could prevent food from being thrown away?"* Examples included better meal planning, freezing leftovers, or avoiding unnecessary purchases.

Another activity focused on clothing. Small groups organized mock "swap events," where they explored the benefits of exchanging clothes instead of buying new ones. Participants shared personal experiences of repairing garments or buying secondhand and reflected on the environmental and financial advantages of extending the life of clothes.

The transportation section included a reflective exercise where participants were asked to map their weekly journeys and identify which trips could realistically be done by bike, on foot, or by public transport. They were also encouraged to imagine their next vacation and consider the environmental benefits of taking a train instead of a flight.

In terms of energy and water conservation, participants committed to simple personal challenges: lowering heating by one degree at home, reducing shower times, or unplugging devices after charging. They also debated the growing issue of digital consumption, responding to prompts such as: *"How can I reduce my digital footprint in daily life?"*

Finally, participants explored sustainable packaging by analyzing real product examples brought into the workshop. They identified whether items used recyclable, reusable, or biodegradable packaging and discussed the role of consumer choice in pressuring companies to adopt greener practices. The exercise concluded with a reflection activity: *"List three eco-friendly practices you could start tomorrow in your household or workplace and explain why they matter."*

5.4 Additional learning resources

To encourage further exploration, participants were directed to practical and region-specific resources:

Circular Economy Greece – a platform providing tools, case studies, and guides on circular practices across sectors: circulargreece.gr

Cyprus Department of Environment – official guides and strategies on sustainable consumption and waste reduction: environment.moa.gov.cy

EU Circular Economy Action Plan – European Commission framework for sustainable production and consumption: ec.europa.eu/environment/circular-economy

These resources were shared not to overwhelm participants but to give them practical references they could return to when seeking more detailed guidance or inspiration for implementing eco-friendly practices in their own lives and communities.

6 GREEN SKILLS IN AGRICULTURE (ReSEES)

6.1 Theory

Green skills in agriculture were addressed by exploring essential topics including the EU goals for sustainable agriculture, the Common Agricultural Policy (CAP) from Farm to Fork, agricultural and circular economy, green skills in agriculture, and composting.

In particular, EU three main policies include the reduction of greenhouse gas emissions, specifically through the mitigation of methane and nitrous oxide by decreasing livestock numbers in wetlands and adopting dietary changes, as well as promoting carbon farming practices, such as agroforestry, to enhance carbon sequestration in the soil. The second policy focus on enhancing biodiversity through the promotion of organic production and the diversification of agricultural practices to improve soil health and sustainability, recognizing that biodiversity is crucial for ecosystem maintenance, while also aiming to increase crop yields by utilizing plant varieties that require less water, with a target reduction of 50% by 2030, and enhancing wetlands and forests as vital resources for agricultural waste management. The third goal set by EU encompass the promotion of sustainable land use and soil health, highlighting that conventional agriculture's increasing dependence on chemical fertilizers has resulted in soil degradation; consequently, the EU aims to foster practices that enhance organic matter and overall soil vitality. Additionally, it acknowledges the critical importance of water as a resource for agriculture, which is jeopardized by climate change and overexploitation, and thus seeks to implement effective water management strategies to collect, conserve, and utilize water resources responsibly in response to evolving climatic conditions.

https://regenx.ag/blog/eu-green-deal-agriculture/

The Common Agricultural Policy (CAP) plays a crucial role in managing the transition towards a sustainable food system and in enhancing efforts made by European agriculture to contribute to the EU's objectives regarding climate change and environmental protection.

https://agriculture.ec.europa.eu/cap-my-country/sustainability/environmental-sustainability/sustainable-agricultural-practices-and-methods_el#ref-%CF%80%CE%B1%CF%81%CE%B1%CE%B4%CE%B5%CE%AF%CE%B3%CE%BC%CE%B1%CF%84%CE%B1-%CE%B3%CE%B5%CF%89%CF%81%CE%B3%CE%B9%CE%BA%CF%8E%CE%BD-%CF%80%CF%81%CE%B1%CE%BA%CF%84%CE%B9%CE%BA%CF%8E%CE%BD

The primary objective of CAP is to enhance organic production to encompass 25% of agricultural land in the EU by 2030, with the strategic goals including a 50% reduction in the use and risk of chemical pesticides, at least a 20% decrease in nutrient losses, a 50% reduction in sales of antimicrobials used for livestock and aquaculture, and a commitment to ensuring that 25% of agricultural land is dedicated to organic farming.

https://www.consilium.europa.eu/el/policies/from-farm-to-fork/

Key elements of agricultural circular economy include the enhancement of natural systems through improving ecosystem health by utilizing cover crops to strengthen soil fertility, promoting biodiversity by creating safe habitats around natural water sources to support ecosystem protection, and addressing climate change by reducing CO2 emissions by 49% by 2050 through the implementation of composting for the management of organic waste, as well as recycling waste by converting food waste into organic fertilizers, while also improving access to thermal energy by developing innovative methods for sustainable food production that meet community needs and supporting local markets to enhance direct sales to consumers.

It also supports local communities encompasses for the maintenance of livelihoods for local farmers through the promotion of training programs for young farmers, as well as fostering connections with local markets by establishing agricultural processing centers that encourage the use of local products.

https://biotechfarms.com/sustainability-from-farm-to-plate-with-circular-economy/

The integration of green skills within the agricultural sector is paramount for promoting sustainable development and addressing pressing environmental challenges. Effective soil management, coupled with the adoption of sustainable agricultural practices, significantly mitigates the environmental footprint while enhancing knowledge of organic farming contributes to the preservation of healthier ecosystems. Furthermore, the implementation of comprehensive waste management strategies, encompassing waste reduction and recycling initiatives, supports circular economic practices that minimize resource depletion. Water management emerges as a critical focus area, emphasizing the efficient utilization of water resources, particularly in regions experiencing scarcity. This proactive approach is further complemented by environmental conservation efforts aimed at safeguarding biodiversity and ecosystems through sustainable methodologies. Additionally, the agricultural sector is progressively adopting sustainable transportation

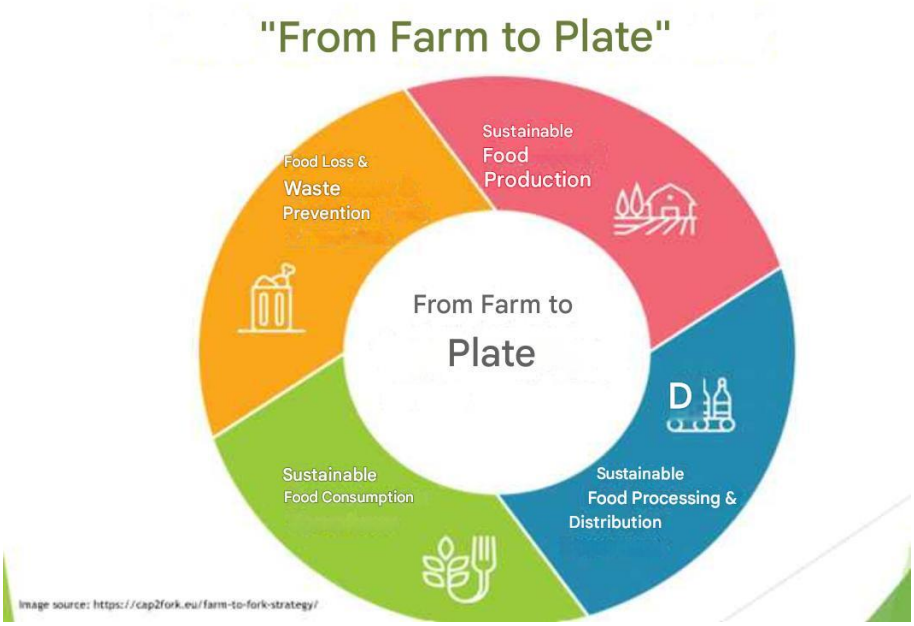
methods, such as electric vehicles, to optimize supply chains and reduce greenhouse gas emissions. The provision of training in technological applications, including the incorporation of digital innovations such as drones and artificial intelligence, further enhances productivity and resource management within agricultural practices. Lastly, the establishment of collaborative networks among farmers, researchers, and organizations is essential for fostering knowledge exchange and innovation, thereby ensuring that sustainable practices are effectively implemented and adapted to meet the evolving challenges of the agricultural landscape.

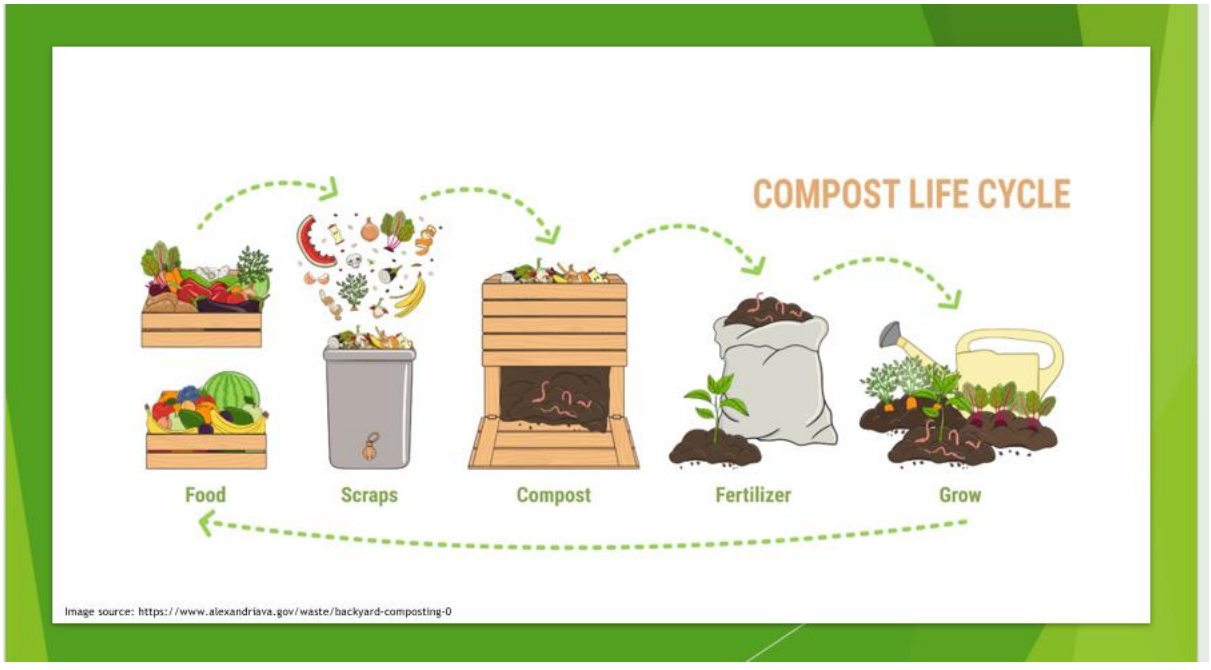
https://agriculture.ec.europa.eu/cap-my-country/sustainability/environmental-sustainability/natural-resources/soil_en
https://www.sciencedirect.com/science/article/pii/S2667010024002336
https://agriculture.ec.europa.eu/overview-vision-agriculture-food/digitalisation_el

Composting refers to the biological process whereby organic materials are decomposed by microorganisms in an oxygen-rich environment and under regulated conditions, especially in terms of temperature and moisture. The resulting product of this process is compost. This compost can be employed to improve the quality of degraded soils and used as a fertilizer for the growth of a diverse range of plant species.

https://ypen.gov.gr/wp-content/uploads/2021/09/Manual-for-home-composting-leaflet-with-rules_EL_combined.pdf

6.2 Practical tools





6.3 Exercises

Participants were engaged through a series of open-ended questions designed to stimulate critical thinking and foster collaboration. Questions such as "From what I heard, what impressed me the most and why?" encouraged attendees to reflect on their learning

experiences and share insights that resonated with them. Additionally, inquiries like "With whom could I collaborate in my community to create something new?" prompted discussions about potential partnerships and innovative projects, while "In which area would I be interested in starting some training to develop new technical skills?" invited participants to explore their interests in further education and skill enhancement. This interactive approach not only enriched the seminar experience but also empowered youth to take an active role in promoting sustainable practices within their communities.

6.4 Additional learning resources

We provided a selection of user-friendly online resources that are easily accessible and tailored to their needs. These resources included interactive guides, video tutorials, and comprehensive articles that cover various aspects of sustainable practices. By equipping attendees with these valuable tools, we aimed to support their ongoing education and encourage them to implement sustainable techniques within their own communities.

https://agropro-drone.eu/wp-content/uploads/2025/02/AgroPro-Curriculum-v.1.2-GR.pdf

https://regenerativefarminggreece.org/el/olives-grazing-pilot-farm/

https://ecogenia.org/

https://ypen.gov.gr/wp-content/uploads/2025/03/b_odigos.pdf

https://www.incommon.gr/praktikos-odigos/kleise-ton-kyklo-2/

https://ypen.gov.gr/wp-content/uploads/2021/09/Manual-for-home-composting-leaflet-with-rules_EL_combined.pdf

7 GREEN SKILLS IN WASTE MANAGEMENT (Anaglyfo)

7.1 Theory

Participants were introduced to the concept of green skills as the knowledge, abilities, values, and attitudes needed to live in, develop, and support a sustainable society. Within the context of waste management, green skills refer to the practical and technical competencies required to reduce, reuse, recycle, and recover resources effectively, as well as the social and entrepreneurial skills necessary to create innovative solutions in this sector.

The training emphasized that waste management is not only about infrastructure or policies — it also depends on people with the right skills to implement and maintain these systems. Workers, entrepreneurs, and citizens alike play a crucial role in separating waste properly, managing recycling facilities, designing circular business models, and raising awareness in their communities.

Core competencies in this area include:

- Technical skills such as sorting waste streams, operating composting systems, handling hazardous materials safely, and using digital tools like sensor-equipped bins or smart collection systems.
- Environmental awareness skills such as understanding the waste hierarchy, recognizing the environmental impacts of different disposal methods, and promoting prevention strategies over disposal.
- Entrepreneurial and innovation skills, enabling individuals to design new services (e.g. upcycling businesses, repair workshops, waste-to-resource startups) that add value while reducing waste.
- Soft skills, such as communication, teamwork, and community engagement, which are vital for building a culture of sustainability.

By linking theory to practice, participants came to understand that green skills in waste management are not just about employment opportunities but also about empowering communities to actively contribute to the circular economy.

7.2 Practical tools

To help participants connect the idea of green skills with real-world application, the training included hands-on tools and resources. Visual guides demonstrated how waste streams are separated in practice, showing examples of correct and incorrect sorting.

Videos highlighted workers in recycling plants and composting facilities, giving participants a sense of the technical skills required on the ground.

Practical worksheets were distributed for conducting waste audits, where participants could track the types and amounts of waste produced in a household, school, or workplace. These audits served as a foundation for identifying opportunities to reduce waste at the source. Digital tools such as mobile apps that track recycling habits or provide information on local collection schedules were also introduced as examples of how technology supports skill-building.

Reports such as the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience and the ILO's Green Skills Report were shared as further reading, demonstrating how the demand for green skills is shaping training programs and job markets across Europe. These resources emphasized that learning green skills is not only beneficial for environmental reasons but also vital for employability in the evolving labor market.

7.3 Exercises

To reinforce the training, participants engaged in interactive exercises that allowed them to practice and reflect on green skills in action. One activity involved a simulation of waste sorting, where participants were given examples of mixed waste and tasked with separating items into the correct streams. This exercise highlighted both technical accuracy and the challenges of contamination when people are not properly trained.

Another group activity asked participants to design a mini business idea in the waste sector. They brainstormed services such as repair cafés, secondhand clothing shops, compost delivery services, or businesses turning construction waste into new materials. By presenting their ideas to the group, participants practiced entrepreneurial thinking while also recognizing how green skills can generate employment opportunities.

Participants also carried out a community engagement role-play, where some acted as citizens and others as municipal officers promoting a new recycling program. This exercise emphasized the importance of communication and awareness-raising skills in ensuring public cooperation.

Finally, reflection activities encouraged participants to think personally: *"What green skills do I already have that support sustainable waste management? What new skills would I like*

to learn, and how could they help me in my future career or community?" This helped participants connect the training to their own development pathways.

7.4 Additional learning resources

To continue their learning, participants were provided with resources that highlight the growing importance of green skills in waste management:

Zero Waste Europe – Training Materials – guides and case studies on local waste reduction and recycling initiatives: zerowasteeurope.eu.

8 GREEN SKILLS IN PRODUCTION SECTORS (ReSEES)

8.1 Theory

General green skills and specific green skills are vital for promoting environmental sustainability. These include the ability to protect ecosystems and maintain biodiversity through various methods, as well as a focus on reducing energy consumption and materials through effective resource management practices. Additionally, understanding and applying sustainable practices in sectors such as agriculture, industry, and urban planning are essential. Together, these skills foster a more sustainable and resilient society.

High-level specialized green skills are essential for the advancement of green technology. This includes expertise in renewable energy sources such as solar, wind, and geothermal energy, which are crucial for reducing reliance on fossil fuels. Additionally, proficiency in wastewater treatment technologies that minimize environmental impact is vital for sustainable resource management. Furthermore, knowledge of recycling processes that enhance resource recovery and decrease landfill usage is imperative. Collectively, these specialized skills contribute significantly to the development and implementation of effective green technologies, fostering a sustainable future.

Cedefop (2014). Terminology of European education and training policy.
https://www.cedefop.europa.eu/files/4117_en.pdf

Green skills in agriculture are essential for promoting sustainable practices that reduce environmental impacts. This includes the implementation of sustainable agricultural practices that enhance soil management and minimize ecological footprints, requiring knowledge of biological agriculture. Effective waste management is crucial for reducing waste production and promoting recycling, thereby supporting circular economic practices. Additionally, efficient water management is necessary for the sustainable use of water resources, especially in areas facing scarcity. Environmental preservation involves protecting biodiversity and ecosystems through sustainable methods. Furthermore, the adoption of digital technologies in agriculture enhances operational efficiency, while collaboration and networking among stakeholders facilitate the exchange of knowledge and technology in the sector. Together, these skills contribute significantly to the sustainability and resilience of agricultural practices.

https://agriculture.ec.europa.eu/overview-vision-agriculture-food/digitalisation_el

https://agriculture.ec.europa.eu/cap-my-country/sustainability/environmental-sustainability/natural-resources/soil_en
https://www.sciencedirect.com/science/article/pii/S2667010024002336

Green skills in waste management are essential for fostering sustainable practices within society. This knowledge encompasses an understanding of waste management systems and the principles of the circular economy, emphasizing techniques for the reduction, reuse, and recycling of materials. Effective waste management and recycling practices not only contribute to environmental sustainability but also promote efficiency within communities, ensuring that resources are utilized responsibly and waste is minimized. By prioritizing these green skills, we can work towards a more sustainable and efficient future.

https://www.sert.work/blog/view/230/What-Are-Green-Skills

8.2 Practical tools

8.3 Exercises

8.4 Additional learning resources

Green skills: https://eyklidis.gr/index.php/courses/programmata-anavathmisis-dexiotiton-kai-epanakatartisis-se-kladous-ypsilis-zitisis-me-emfasi-stis-psifiakes-kai-prasines-dexiotites/

9 SUSTAINABLE PRACTICES (Anaglyfo)

9.1 Theory

During the training, participants were introduced to sustainable practices as long-term approaches that embed environmental, social, and economic responsibility into the way communities, organizations, and businesses operate. While eco-friendly practices focus on individual lifestyle choices, sustainable practices extend to collective systems and strategies that ensure resources are used wisely, ecosystems are preserved, and future generations can meet their needs.

Participants explored how sustainability is integrated into workplaces and industries. Businesses were presented as key drivers of change, capable of reducing their environmental footprints by adopting renewable energy, improving supply chain transparency, and investing in eco-design. The importance of sustainability standards, such as ISO 14001 environmental management systems and eco-label certifications, was highlighted as a way to formalize green commitments.

At the community and municipal level, sustainable practices were linked to infrastructure and public services. Examples included local recycling and composting initiatives, bike-sharing systems, and urban gardening projects that reconnect citizens with food production. Participants discussed how cities across Europe are redesigning transport systems to favor walking, cycling, and public transport as part of their sustainable urban mobility plans.

The session also emphasized sector-specific approaches. In tourism, for example, sustainable practices include water-saving measures, renewable energy installations in hotels, and certifications such as EU Ecolabel for accommodations. In agriculture, sustainable practices involve crop rotation, reduced pesticide use, and soil conservation. In construction, green building standards such as LEED or Passive House were presented as models for reducing energy consumption and emissions.

Finally, government and policy frameworks were addressed. The European Green Deal and national circular economy strategies were presented as overarching policies that guide sustainable practices across sectors. Participants reflected on how regulations — such as plastic bans, carbon taxes, and extended producer responsibility laws — are designed to encourage businesses and consumers to adopt sustainable behaviors. The discussion concluded with a focus on innovation and digital tools, such as precision farming, smart grids, and eco-design technologies, which are opening new opportunities for sustainable development at scale.

9.2 Practical tools

To demonstrate how sustainable practices can be embedded into organizations and communities, participants were introduced to a set of illustrative tools and resources. Case studies were used to show how municipalities have implemented zero-waste programs or how companies reduced their energy costs by installing renewable energy systems. One case came from **Tübingen, Germany,** where the municipality introduced a city-wide tax on single-use packaging. At the same time, local businesses were offered subsidies to support their transition to reusable alternatives. This policy not only reduced waste but also encouraged citizens and businesses to rethink their consumption habits, illustrating how local governments can use incentives and regulations to drive systemic change.

Another inspiring case study was from **Gorje and Bled, Slovenia,** two municipalities that became early adopters of Zero Waste certification. Their approach combined comprehensive waste prevention, strong reuse initiatives, and ambitious recycling programs. By involving citizens, schools, and businesses, these towns demonstrated that even small communities can lead the way in sustainable resource management. Their success showed participants how collective responsibility and strong local leadership can deliver measurable environmental results.

Videos of successful sustainable initiatives, such as eco-certified hotels in Greece and community-led recycling hubs in Cyprus such as Green-Dot, provided real-world inspiration. Participants were also directed to key documents, including the EU Circular Economy Action Plan, which provides a roadmap for reducing waste and transforming industries, and the UN Sustainable Development Goals (SDGs), which offer a global framework for measuring sustainability progress. These tools demonstrated that sustainable practices are not abstract ideals but practical, achievable actions at organizational and community levels.

9.3 Exercises

Participants engaged in interactive activities that challenged them to think about sustainability beyond their personal lives. In small groups, they were asked to imagine themselves as sustainability consultants for a business, identifying concrete measures to make its operations more sustainable. They considered options such as switching to renewable energy, adopting eco-packaging, or introducing recycling programs for employees and customers.

Another exercise invited participants to analyze their local community and map out opportunities for sustainable initiatives. Groups proposed ideas such as creating community gardens, establishing bike-sharing stations, or promoting local farmers' markets. This activity encouraged them to think about collective impact and how to engage municipalities or local organizations in driving change.

A case study simulation was also conducted, where participants reviewed a real-world example of a hotel or tourism business implementing sustainable practices. They identified what worked, what challenges the business faced, and what additional measures could be taken to enhance its sustainability strategy.

To conclude, participants were invited to reflect on how sustainability practices could be applied in their future workplaces or organizations. They answered the question: *"If I had the chance to redesign my workplace or community to be more sustainable, what changes would I prioritize, and why?"* This reflection linked systemic practices back to personal agency, empowering participants to see themselves as potential changemakers within larger structures.

9.4 Additional learning resources

To support further learning, participants were provided with selected resources that highlight sustainability in practice:

1) "Sustainable Management of Green Waste in Urban Settings: A Case Study on Energy Recovery and Heating Solutions in the Municipality of Athens (Greece)". This paper explores how Athens handled green waste from urban and private gardens, converting it into energy or thermal heat for public facilities. It illustrates how a major city applies circular waste practices while considering technical, economic, and regulatory constraints.
2) Cyprus Institute / European Sustainable Development Report (SDR) for Cyprus. The local analysis of how Cyprus is performing on SDGs (including environmental and sustainability goals) gives an overview of the challenges, gaps, and trajectories relevant to your audience.

These resources gave participants a broader perspective, linking their local and national contexts to European and international strategies.

10 RENEWABLE ENERGY (ReSEES)

10.1 Theory

Renewable energy comes from natural sources that are replenished more quickly than they are used. For instance, sunlight and wind are examples of resources that are always available.

Energy sources such as wind, solar, hydroelectric, ocean, geothermal, biomass, and biofuels present cleaner alternatives to fossil fuels. They help minimize pollution, expand our energy options, and reduce our dependence on unpredictable fossil fuel prices.

1. European Parliament. (n.d.). *Renewable energy*. Retrieved September 15, 2025, from https://www.europarl.europa.eu/factsheets/en/sheet/70/renewable-energy

2. United Nations. (n.d.). *What is renewable energy?* Retrieved September 15, 2025, from https://www.un.org/en/climatechange/what-is-renewable-energy#:~:text=Renewable%20energy%20is%20energy%20derived,that%20are%20constantly%20

10.2 Practical tools

Participants were presented with visual examples and a variety of real-life case scenarios demonstrating the practical applications of renewable energy. This approach not only enhanced their understanding of the concepts but also illustrated the effectiveness and benefits of implementing renewable energy solutions in various contexts. By engaging with tangible examples, participants were able to grasp the significance of renewable energy in addressing current energy challenges.

10.3 Exercises

Participants were encouraged to engage thoughtfully with the following open-ended questions, designed to inspire meaningful dialogue and exploration of renewable energy

1. **Can you share examples of practical renewable energy sources from your community?**

2. **What challenges do you think we face in transitioning to renewable energy sources?**

3. **Would you be interested in gaining more skills in one of the renewable energy sources?**

10.4 Additional learning resources

11 WASTE MANAGEMENT (Anaglyfo)

11.1 Theory

Participants were introduced to waste management as the organized process of collecting, transporting, treating, and disposing of waste in ways that protect public health and the environment. Unlike eco-friendly practices, which focus on individual lifestyle choices, or sustainable practices, which emphasize organizational and community-level strategies, waste management examines the systems and infrastructures that make these efforts possible.

The training highlighted the 3Rs framework — Reduce, Reuse, Recycle — as the cornerstone of modern waste management. Reduction refers to strategies that minimize the generation of waste at its source, such as more efficient product design or reduced packaging. Reuse extends the life of products and materials by finding new purposes for them before they become waste. Recycling converts waste into raw materials for new products, conserving resources and reducing the need for virgin materials. Together, these strategies contribute to conserving resources, lowering emissions, and reducing landfill dependency.

Participants also explored the importance of waste separation at the source. Effective systems use color-coded bins or clearly labeled containers to distinguish between organic, recyclable, and non-recyclable materials. Proper separation not only increases the efficiency of recycling and composting but also lowers contamination rates, making resource recovery more cost-effective. Composting methods were discussed in detail: aerobic composting, which uses oxygen to decompose organic matter, and anaerobic composting, which occurs without oxygen. Both processes reduce waste volumes, improve soil quality, and cut greenhouse gas emissions, positioning composting as a vital component of sustainable waste systems.

Waste management within businesses was presented as a critical sector of action. Companies can reduce waste at its source by auditing production processes, implement in-house recycling and composting programs, and design employee engagement strategies that promote a culture of resource efficiency. By involving suppliers and adopting circular supply chains, businesses not only minimize their environmental impact but also often realize long-term financial savings.

Community engagement was highlighted as a fundamental driver of effective waste management. Local initiatives that encourage recycling, composting, and waste reduction foster collaboration between residents, schools, and organizations. Educational campaigns raise awareness of the consequences of poor waste practices while empowering individuals

to contribute to collective solutions. Municipal programs that encourage active citizen participation have been shown to significantly reduce reliance on landfill and create a stronger sense of shared responsibility.

Finally, the role of government was underscored as essential in creating the enabling environment for effective waste management. Governments provide regulatory frameworks that set standards for collection, treatment, and disposal, while also offering incentives such as tax breaks or subsidies for recycling initiatives. Investment in infrastructure — from material recovery facilities to composting plants — ensures that community and business efforts can be supported by robust systems. Public awareness campaigns further reinforce these policies by normalizing sustainable waste habits. Together, these policies and structures demonstrate how waste management is not only a technical process but also a collective social responsibility.

11.2 Practical tools

To bring the theory to life, participants were introduced to practical tools that support effective waste management. Visual diagrams illustrated the stages of waste processing, from household separation to municipal collection and final treatment. Videos demonstrated successful systems in European cities, showing how infrastructure, community participation, and policy can combine to achieve measurable results.

Several case studies from across Europe were presented. Milan, Italy was highlighted as a pioneer in separate bio-waste collection, managing to achieve some of the highest organic waste collection rates in Europe despite being a densely populated urban environment. Madrid, Spain was introduced as home to Europe's largest smart waste installation, where over 11,000 sensors in bins monitor fill levels and optimize collection routes through smart software, significantly improving efficiency. Similarly, Amsterdam and Barcelona were shown as examples of cities using sensor-equipped bins to reduce unnecessary vehicle trips, fuel consumption, and emissions.

The session also examined Stockholm, Sweden, which promotes a circular economy through innovative initiatives such as the ReTuna shopping mall, the world's first retail center dedicated entirely to selling upcycled and recycled products. On a national level, Germany was highlighted as a leader in waste management, applying a strict waste hierarchy with a strong emphasis on prevention, reuse, and recycling. Policies such as mandatory waste sorting, deposit-refund schemes for beverage containers, and wide-reaching public awareness campaigns have made Germany one of the most effective countries in Europe in terms of resource recovery.

These examples helped participants see how theory translates into practice at city and national levels, while also offering models that could inspire adaptation in their own regions. To complement these cases, participants were introduced to the EU Waste Framework Directive, which sets the overall legal framework for waste prevention, recycling, and treatment across member states, as well as local guides from Cyprus and Greece that demonstrate regional approaches to waste management.

11.3 Exercises

Participants engaged in a series of exercises designed to help them critically examine waste management from a systems perspective. In one activity, they were asked to map the waste journey in their own community, identifying points where waste is generated, collected, separated, and treated. This exercise revealed gaps in infrastructure and highlighted opportunities for community engagement.

In small groups, participants designed a business waste management plan. They explored strategies such as conducting a waste audit, establishing recycling points within the workplace, and introducing composting solutions for organic waste. Groups also discussed how employee training and supplier collaboration could make these systems more effective.

Another exercise focused on community-level action. Participants designed an educational campaign to promote proper waste separation and recycling, considering the use of posters, social media, and school programs. They reflected on questions such as: “How can we motivate residents to use color-coded bins correctly?” and “What incentives could our municipality provide to encourage composting?”

The session concluded with a reflection activity in which participants considered the role of government. They were asked: “If you were a policymaker, what regulation or incentive would you introduce to improve waste management in your community?” This prompted discussions about policy design, enforcement, and the importance of balancing public education with regulatory measures.

11.4 Additional learning resources

To deepen their understanding, participants were directed to a range of resources on waste management:

EU Waste Framework Directive – the main European legislation guiding waste prevention, recycling, and disposal: ec.europa.eu/environment/topics/waste-and-recycling.

12 SUMMARY (ANAGLYFO)

This manual has explored the many dimensions of sustainability, beginning with the foundational principles of sustainable development and extending into practical areas where individuals, communities, and organizations can make a meaningful impact.

We examined sustainability as the overarching framework that balances environmental, social, and economic goals, setting the stage for action. Renewable energy was highlighted as a cornerstone of climate solutions, offering pathways for communities and businesses to reduce emissions and enhance resilience. The chapters on waste management and green skills in waste management emphasized the importance of both systemic infrastructure and the competencies individuals need to make those systems function effectively.

The section on eco-friendly practices encouraged participants to reflect on daily lifestyle choices — from food and clothing to transport and packaging — while sustainable practices scaled the conversation up to organizations, communities, and policy frameworks that embed sustainability into their long-term strategies. The chapters on green skills in agriculture and green skills in production sectors illustrated how specific industries are evolving, highlighting opportunities for innovation, employment, and circular approaches to resource use.

Across all chapters, a common thread emerged: sustainability is not achieved by isolated actions but through a combination of informed individuals, engaged communities, innovative businesses, and supportive policies. By equipping participants with both knowledge and practical skills, this manual aims to foster empowerment, encourage collaboration, and inspire new initiatives.

The journey toward a greener future requires shared responsibility and collective effort. With the insights, tools, and resources provided here, participants are encouraged to take what they have learned and apply it in their personal lives, professional paths, and community engagement, contributing to the broader transition to a sustainable and inclusive society.

13 Additional information

AI-DRIVEN SKILL INSIGHTS FOR THE SUS-FUT PROJECT

SUS-FUT— "Sustainable Future: Equipping Included Youth with Green Skills for the Circular Economy"—is an Erasmus+ initiative that will train young people from marginalised backgrounds so they can flourish in the expanding green and circular economy. Athens University of Economics and Business leads the work, partnering with AK Anaglyfo Consulting of Cyprus under the scientific guidance of Professor Phoebe Koundouri. Alongside face-to-face workshops, an open Green-Skills Manual and a self-paced learning platform, the consortium employs a novel artificial-intelligence method to verify that every course genuinely develops the competences today's employers require.

The AI engine functions like a tireless expert librarian. It speed-reads each course description and files it under the most relevant sustainability theme by consulting a digital index of European-standard skills[1]. When the engine detects strong textual echoes between a course and a skill definition, the course is tagged as Green, Digital, Circular or Blue. The process is fast, impartial and repeatable, enabling trainers to rerun the analysis whenever content changes while remaining confident that results will stay consistent. Every automated decision is stored together with a concise textual explanation, so reviewers, funders and employers can trace the logic without specialist knowledge.

Benefits extend beyond SUS-FUT itself. Training providers throughout Greece and Cyprus can reuse the same engine to assemble a shared map of courses aligned to green and circular skills. Employers gain confidence that listed competences match recognised standards, easing recruitment for emerging climate-friendly roles. Career counsellors and public employment agencies can mine the data to guide learners toward precise up-skilling paths, while policymakers monitoring European Green Deal targets obtain real-time statistics on which competences are taught, where and to whom.

Because the SUS-FUT solution adheres to the broader "Semantic Synergy" framework[2] it can readily grow in scope. The identical engine can scan policy strategies, industry roadmaps or individual CVs, matching them against the evolving course catalogue and revealing fresh opportunities for cooperation. In this sense the AI module is not merely a backstage tool; it is connective tissue able to knit together educators, employers and decision-makers in pursuit of an inclusive, circular and resilient economy.

The pipeline begins by normalising each sentence with a standard natural-language pre-processing chain that tokenises words, removes punctuation and stop-words, and converts tokens to their lemmas. Cleaned sentences are embedded by the transformer model all-MiniLM-L6-v2, which situates meaning in a 384-dimensional semantic space. Skill definitions from the European ESCO ontology undergo the same treatment and are cached inside high-performance FAISS indices.

For every course sentence, the engine queries each thematic index and records the cosine similarity of the closest match. Scores below a certain threshold - chosen after a grid search against a hand-labelled validation set—are discarded. Similarities that clear the bar are averaged over all sentences in the course. The theme with the highest average becomes the primary label; any theme scoring at least eighty percent of that peak is deemed secondary. Because many courses receive useful secondary tags, the engine also calculates a balance ratio: values near one indicate courses whose content spans two themes almost evenly.

This SUS-FUT implementation therefore marries a clear, human-readable narrative with a transparent, rigorously validated technical core, equipping the project—and the wider AE4RIA ecosystem—with an extensible foundation for future collaboration and insight.

References

[1] European Commission. ESCO: Skills and competences. European Skills, Competences, Qualifications and Occupations portal (2024).

[2] Koundouri P., Landis C., Feretzakis G. “Semantic Synergy: Unlocking Policy Insights and Learning Pathways Through Advanced Skill Mapping.” arXiv:2503.10094 (2025).

Glossary for Sus-FUT

Adapting to climate change: Adapting to climate change involves changing our behaviour and ways of doing things to prepare for the unavoidable, so as to be able to protect ourselves, the environment and the economy from the impacts of climate change. https://eur-lex.europa.eu/EN/legal-content/glossary/adaptation-to-climate-change.html

Biodiversity: A contraction of the two words ‘biological’ and ‘diversity’, biodiversity refers to the variety of life on earth in general, or the variety of living things in a given ecosystem or region. It covers all living things, ranging from bacteria, plants, and animals to humans. Biodiversity plays a vital role in ecosystem services, which are the services that nature supplies. These include pollination, climate regulation, flood protection, soil fertility, and the supply of food, fuel, fibre and medicines.

https://eur-lex.europa.eu/EN/legal-content/glossary/biodiversity.html

Carbon Footprint: The carbon footprint represents the total amount of carbon dioxide (CO2) produced from daily activities related to lifestyle. It reflects each individual's contribution to climate change.
https://climateacademy.gr/carbon_footprint/

The Common Agricultural Policy (CAP): The primary objective of CAP is to enhance organic production to encompass 25% of agricultural land in the EU by 2030, with the strategic goals including a 50% reduction in the use and risk of chemical pesticides, at least a 20% decrease in nutrient losses, a 50% reduction in sales of antimicrobials used for livestock and aquaculture, and a commitment to ensuring that 25% of agricultural land is dedicated to organic farming.
https://www.consilium.europa.eu/el/policies/from-farm-to-fork/

Composting: is defined as the biological process of decomposing organic materials by microorganisms in the presence of oxygen and under controlled conditions, particularly concerning temperature and moisture, with the end product being compost. Compost can be utilized to enhance the quality of degraded soils, as well as to serve as a fertilizer for the cultivation of various plant varieties.
https://ypen.gov.gr/wp-content/uploads/2021/09/Manual-for-home-composting-leaflet-with-rules_EL_combined.pdf

Circular economy: circular economy is a model of production and consumption that involves the exchange, leasing, reuse, repair, renovation, and recycling of existing materials and products as much as possible in order to extend their lifespan. https://www.un.org/en/climatechange/what-is-renewable-energy

Climate change refers to man-made (anthropogenic) climate change, that is an increase in global temperatures caused by man-made emissions of gases such as carbon dioxide and methane, known as greenhouse gases.
https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Climate_change

Ecosystem: An ecosystem is a system in which living things (plants, animals, bacteria, etc.) and their non-living surroundings interact as a functional unit.

https://eur-lex.europa.eu/EN/legal-content/glossary/ecosystem.html

European Green Deal: The European Green Deal is the EU's strategy for growth. It is a set of policy initiatives, launched in 2019, that puts the EU on a path towards green transition, with the ultimate goal of achieving climate neutrality by 2050. https://www.consilium.europa.eu/el/policies/european-green-deal/

European green policy: This policy emphasizes the sustainable use of natural resources and aims to address significant global environmental challenges, including climate change and biodiversity loss, through precautionary measures and the polluter-pays principle. The EU oversees areas such as air and water pollution, nature conservation, waste management, and climate action, while also promoting a transition to a sustainable, circular economy. Example of a Key initiative is the European Green Deal.

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:environment

Green economy: Green economy aim is to improve human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient, and socially inclusive'. It is an economy which recognises the true value of environmental resources and ecosystems and is closely related to the term 'sustainable development', since both relate to the aim of conserving environmental resources for future generations.

https://eur-lex.europa.eu/EN/legal-content/glossary/green-economy.html

Greenhouse gases constitute a group of gases that trap heat in the atmosphere, contributing to global warming. Such as carbon dioxide (CO_2) and methane (CH_4)

https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Greenhouse_gas_(GHG)

Green and digital skills: The Twin Transition emphasizes the need for integrating skills and climate policies for green and digital skills, crucial for climate neutrality and job recovery. https://digital-skills-jobs.europa.eu/en/latest/news/twin-skills-twin-transition-defining-green-digital-skills-and-jobs

Green skills: Skills needed in a low-carbon economy, are required in all sectors and at all levels in the workforce as emerging economic activities create new (or renewed) occupations.

https://www.oecd.org/en/publications/greener-skills-and-jobs_9789264208704-en.html

Linear economy: Linear economy is a system in which people buy a product, use it, and then throw it away. The term linear refers to the straight progression that a product can follow, with a beginning, a middle and an end. This model is characterized by a high volume of new manufacturing. The linear economy is a polluting system that can hurt nature and the climate. It causes loss of biodiversity.

https://www.eib.org/en/stories/linear-economy-recycling

Renewable energy sources such as wind, solar and hydroelectric power, ocean and geothermal energy, biomass and biofuels offer cleaner alternatives to fossil fuels. They reduce pollution, broaden our energy options and decrease our dependence on volatile fossil fuel prices

https://www.europarl.europa.eu/factsheets/en/sheet/70/renewable-energy

Sustainability: Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

https://www.un.org/sustainabledevelopment/development-agenda-retired/

Sustainable Development Goals: The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. The 17 SDGs are integrated—they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability.

https://www.undp.org/sustainable-development-goals

Linear economy: Linear economy is a system in which people buy a product, use it, and then throw it away. The term linear refers to the straight progression that a product can follow, with a beginning, a middle and an end. This model is characterized by a high volume of new manufacturing. The linear economy is a polluting system that can hurt nature and the climate. It causes loss of biodiversity.

https://www.eib.org/en/stories/linear-economy-recycling

The Farm to Fork Strategy: is at the heart of the European Green Deal aiming to make food systems fair, healthy and environmentally friendly.

https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

Waste hierarchy: The waste hierarchy applies as a priority order in waste prevention and management legislation and policy. It is the cornerstone of European Union (EU) waste

policies and legislation and is laid down in the EU waste framework directive. Its aim is twofold: to minimize adverse impacts of the generation and management of waste; and to improve resource efficiency.

https://eur-lex.europa.eu/EN/legal-content/glossary/waste-hierarchy.html#:~:text=The%20hierarchy%20is%20generally%20depicted,resort%20solution%20to%20managing%20waste.

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