GoGreen

LOCAL ACTION FOR EUROPEAN GREEN DEAL

Intellectual Output 1

Environmental Local Governance for the 21st Century

ZOERSEL

Associação Portuguesa Educação Ambiental

aspea

município de lousada

SOTO DEL REAL

Ireland Leave No Trace

SYNTHESIS CENTER FOR RESEARCH AND EDUCATION

Erasmus+

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein. Project number: 2021-1-BE02-KA220-ADU-000026044

Table of Contents

Module 1	2
Module 2	18
Module 3	37
Module 4	55
Module 5	80
Module 6	98
Module 7	113
Module 8	132
Module 9	146
Module 10	160
Field Study Visit 1	192
Field Study Visit 2	200
Field Study Visit 3	210
Field Study Visit 4	220
Field Study Visit 5	230
Field Study Visit 6	240
Field Study Visit 7	250
Field Study Visit 8	260
Field Study Visit 9	270
Field Study Visit 10	280

2 Facilitation & Conflict Resolution

Conflict Resolution and Facilitation Techniques will be examined by learning how conflict arises and how it can be prevented.

3 Stakeholder Engagement

This module will examine how to identify the key stakeholders who can aid in the delivery of Green Deal initiatives in your own region. The module will illustrate how to build and maintain relationships with stakeholder groups and how to address challenges.

4 Practical field trips

This unit will take participants to sites where various stakeholders and potential conflicts can be observed. Participants will hear about how stakeholders have been brought on-board.

Learning outcomes

- *Differentiate between communication techniques.*
- *Understand how conflict arises and how facilitation and conflict resolution techniques can address these.*
- *Identify and develop ways to engage with stakeholders on an ongoing basis.*

Apply learnings during field trips.

Module content

Introduction

As communities across Europe confront the pressing challenge of adapting to climate change, they will face numerous obstacles at local, regional, and national levels. Achieving the ambitious EU target of climate neutrality by 2050 demands profound transformations in daily life and societal practices. To meet these targets, communities will need to implement radical changes in how they live and work, requiring a collective effort to embrace new, sustainable behaviors and practices.

Effective communication is crucial in this context. It serves as a fundamental tool for conveying messages and facilitating change. Communication is inherently a two-way process, involving not just the transmission of information but also active engagement with stakeholders. By fostering open dialogues, communities can share ideas, address concerns, and receive valuable feedback, which is essential for driving collective action towards climate resilience.

However, addressing climate change can be particularly challenging as it often involves altering long-established habits and practices. New proposals and strategies to mitigate climate impacts, such as reducing car use or conserving energy, may be perceived as criticism or intrusion into personal lifestyles. This perception can lead to resistance and resentment among community members. Therefore, it is critical to approach climate communication with sensitivity and clarity. Engaging with communities through straightforward, empathetic messaging helps in mitigating feelings of criticism and fosters a collaborative atmosphere for implementing necessary changes.

Stakeholder engagement is a vital component of effective climate action. A successful engagement strategy requires continuous communication, active listening, and genuine collaboration. Keeping stakeholders informed throughout the engagement process helps build trust and ensures that their concerns and ideas are considered. Ongoing dialogue allows for a more inclusive approach to decision-making, which is crucial for achieving broad support for climate initiatives.

Conflicts may arise between different stakeholders, reflecting diverse interests and perspectives on climate action. To manage these conflicts constructively, it is important to involve independent facilitators who can mediate discussions and ensure that all voices are heard. Facilitators play a key role in maintaining a balanced and fair dialogue, helping to address grievances and find common ground. Trust in the process is essential; stakeholders must feel that their input is valued and that they are supported throughout the engagement process. By fostering an environment of trust and openness, communities can navigate conflicts more effectively and work together towards shared climate goals.

In summary, as Europe moves towards climate resilience, the ability to communicate effectively and engage stakeholders meaningfully will be crucial. Building trust through transparent, empathetic communication and inclusive dialogue will help communities overcome resistance and collaboratively embrace the changes necessary for a sustainable future.

State of the art

Outdoor Recreation Growth and Demand

In recent years, Ireland has experienced a significant surge in outdoor recreational activities. This trend, already growing steadily over the past decade, was accelerated by the COVID-19 pandemic. With restrictions on indoor gatherings and a heightened awareness of health and well-being, more people have turned to nature as a source of recreation and solace. Activities such as hiking, cycling, camping, kayaking, and wild swimming have seen substantial increases in participation. Ireland's diverse landscapes, from rugged coastlines and rolling hills to serene forests and tranquil lakes, provide an ideal setting for these pursuits.

However, this growth in outdoor recreation has not come without challenges. The increased footfall in natural areas has placed additional pressure on Ireland's environment. Popular destinations such as the Wicklow Mountains, the Burren, and the Wild Atlantic Way have seen significant rises in visitor numbers, which can lead to overcrowding, environmental degradation, and increased risks of accidents. The balance between promoting outdoor activities for public health and well-being and protecting Ireland's natural landscapes has become a central focus for policymakers, environmental organisations, and the outdoor community.

Best Practices for Sustainable Recreation

As more people venture into Ireland's outdoors, the promotion of sustainable and responsible recreation practices has become increasingly important. Leave No Trace Ireland has been at the forefront of this movement, advocating for behaviours that minimise the impact of outdoor activities on the environment. This organisation is part of a broader international initiative that encourages outdoor enthusiasts to follow seven core principles, including planning ahead, travelling and camping on durable surfaces, disposing of waste properly, leaving what they find, minimise campfire impacts, respecting wildlife, and being considerate of other visitors.

Leave No Trace Ireland collaborates with various stakeholders, including government agencies, educational institutions, community groups, and businesses, to spread awareness about these principles. They organise training workshops, develop educational materials, and run public awareness campaigns to instil a culture of responsibility among outdoor enthusiasts. By promoting these best practices, Leave No Trace Ireland aims to ensure that Ireland's natural areas can be enjoyed by future generations without suffering from the cumulative impacts of recreational use.

In addition to Leave No Trace, the Irish government and environmental bodies have developed a Code of Outdoor Ethics, which outlines expectations for behaviour in natural areas. This code emphasises the importance of respecting private property, as much of Ireland's countryside is privately owned farmland. It encourages visitors to stay on designated paths, close gates behind them, and avoid disturbing livestock. The code also highlights the need to minimise noise, protect wildlife, and leave no trace of their visit by taking litter home.

Irish Policies Supporting Outdoor Recreation

The growth of outdoor recreation has prompted the Irish government to develop policies and strategies aimed at promoting sustainable practices while enhancing access to and enjoyment of natural areas. One of the most significant initiatives in this regard is the National Outdoor Recreation Strategy (NORS), currently being developed by the Department of Rural and Community Development. This strategy aims to create a cohesive framework for the promotion, management, and sustainable development of outdoor recreation across Ireland. It addresses key issues such as access to land, infrastructure development, public safety, and the protection of natural resources.

The NORS is expected to outline a vision for outdoor recreation that balances the needs of recreational users with the imperative of conserving Ireland's natural and cultural heritage. It will likely include guidelines for developing and maintaining trails, managing visitor numbers, and protecting sensitive habitats. The strategy will also emphasise the importance of collaboration between public and private stakeholders, recognising that successful management of outdoor recreation requires coordinated efforts across various sectors.

Another key policy document that supports outdoor recreation is the National Planning Framework (NPF), part of Project Ireland 2040. The NPF provides a long-term vision for Ireland's development, with a strong focus on sustainability. It highlights the importance of green infrastructure, which includes parks, forests, and other natural areas that provide opportunities for outdoor recreation. The NPF advocates for the integration of green spaces into urban and rural planning, ensuring that all communities have access to nature for recreation, health, and well-being. It also stresses the need to protect and enhance the ecological integrity of these spaces, balancing recreational use with conservation.

Ireland's commitment to biodiversity conservation is further reinforced through its Biodiversity Action Plan. This plan aligns with the goals of promoting outdoor recreation by ensuring that such activities do not compromise the health of ecosystems. It includes measures to manage visitor access to ecologically sensitive areas, such as wetlands, dunes, and peatlands, which are particularly vulnerable to disturbance. The Biodiversity Action Plan also promotes public education on the importance of protecting Ireland's rich biodiversity, encouraging outdoor enthusiasts to adopt behaviours that minimise their impact on wildlife and habitats.

The National Countryside Recreation Strategy (NCRS), managed by Comhairle na Tuaithe (the Countryside Council), also plays a critical role in guiding the development and management of outdoor recreation in Ireland. The NCRS addresses issues such as access to private land, the development of recreational infrastructure, and the promotion of best practices among outdoor users. It seeks to balance the interests of landowners, recreational users, and conservationists, ensuring that outdoor activities are conducted in a manner that respects both private property and the natural environment.

Communication Strategies

Effective communication is key to promoting best practices in outdoor recreation and ensuring that policies and guidelines are widely understood and followed. In Ireland, various strategies are employed to communicate these messages to the public.

Digital Platforms have become increasingly important in recent years as a means of reaching a broad audience. Government agencies, environmental organisations, and outdoor recreation groups utilise websites, social media, and mobile apps to disseminate information on responsible outdoor behaviour. For instance, Leave No Trace Ireland regularly updates its website with tips, resources, and educational content aimed at both seasoned outdoor enthusiasts and newcomers. Social media platforms like Facebook, Twitter, and Instagram are used to share real-time updates, engage with the public, and run awareness campaigns that highlight the importance of sustainable recreation.

Signage and Interpretation are also critical components of communication in outdoor settings. In many of Ireland's national parks, nature reserves, and popular walking trails, visitors will find signage that provides guidance on best practices. This may include reminders to stay on designated paths, information about local wildlife and habitats, and instructions on waste disposal. Interpretive panels are often used to educate visitors about the cultural and ecological significance of the area, helping to foster a sense of respect and stewardship.

Workshops and Training are another important aspect of communication and education. Organisations like Leave No Trace Ireland, Coillte (Ireland's state forestry agency), and local authorities offer training sessions for outdoor recreation leaders, educators, and the general public. These workshops are designed to teach participants about sustainable practices, safety in the outdoors, and the principles of Leave No Trace. By equipping people with the knowledge and skills needed to enjoy the outdoors responsibly, these training programmes help to reduce the environmental impact of outdoor activities.

Collaboration and Partnerships are also vital in spreading the message of sustainable outdoor recreation. Many of Ireland's outdoor recreation initiatives involve partnerships between government bodies, non-governmental organisations, community groups, and businesses. These collaborations help to pool resources, share expertise, and reach a wider audience. For example, tourism agencies work closely with environmental groups to ensure that promotional materials for popular destinations include information on responsible tourism and outdoor ethics.

Despite these efforts, challenges remain. Changing public behaviour is not always easy, and some individuals may be resistant to following guidelines, particularly when they conflict with personal preferences or habits. Additionally, the sheer number of visitors to some of Ireland's most popular outdoor destinations can make it difficult to enforce best practices consistently. Addressing these challenges will require ongoing efforts to refine communication strategies, improve infrastructure, and engage with the public in meaningful ways.

Challenges

The promotion and implementation of best practices in outdoor recreation in Ireland face several significant challenges, particularly as the popularity of outdoor activities continues to rise. These challenges encompass environmental, social, and logistical aspects, each requiring careful consideration and management.

1. Increased Pressure on Natural Resources

One of the most pressing challenges is the increased pressure on natural resources due to the growing number of people engaging in outdoor activities. Popular locations like the Wicklow Mountains, Cliffs of Moher, and the Wild Atlantic Way often experience overcrowding, especially during peak seasons. This influx can lead to environmental degradation, including soil erosion, damage to vegetation, disturbance to wildlife, and littering. Managing the impact of high visitor numbers while maintaining the integrity of these natural spaces is a complex task. Ensuring that infrastructure, such as trails and facilities, can accommodate the growing number of visitors without harming the environment is essential.

2. Balancing Access with Conservation

Another challenge lies in balancing public access to outdoor spaces with the need for conservation. Ireland's diverse landscapes, from mountains to coastlines, are home to fragile ecosystems that can be easily disturbed by human activity. The National Outdoor Recreation Strategy (NORS) and the Biodiversity Action Plan aim to address this by promoting sustainable recreation practices, but enforcing these guidelines is difficult. Visitors may unknowingly or deliberately stray from designated paths, leading to the destruction of sensitive habitats. Striking a balance between encouraging outdoor recreation and protecting the environment requires ongoing education, monitoring, and, in some cases, restrictions on access to particularly vulnerable areas.

3. Public Awareness and Behaviour Change

Changing public behaviour and increasing awareness about sustainable outdoor practices is another significant challenge. While organisations like Leave No Trace Ireland play a crucial role in educating the public, ingraining these practices in the behaviour of all outdoor enthusiasts is a long-term effort. Some visitors may be unaware of the environmental impact of their actions, such as littering or disturbing wildlife. Others may resist following guidelines that they perceive as restrictive or unnecessary. Overcoming these attitudes requires effective communication strategies, continuous public engagement, and possibly stricter enforcement of rules in certain areas.

4. Land Access and Private Ownership

In Ireland, much of the countryside is privately owned, which presents challenges regarding access. While the National Countryside Recreation Strategy (NCRS) seeks to facilitate access to the countryside for recreational purposes, it must also respect the rights of landowners. This delicate balance can lead to conflicts, especially when recreational use interferes with agricultural activities or private property rights. Developing and maintaining positive relationships between landowners and outdoor enthusiasts is crucial for the continued success of outdoor recreation initiatives.

5. Resource Allocation and Infrastructure Development

Finally, the allocation of resources for the development and maintenance of recreational infrastructure poses a challenge. As demand for outdoor recreation grows, so too does the need for investment in trails, signage, visitor facilities, and conservation efforts. However, funding and resources are often limited, which can result in inadequate infrastructure to support the volume of visitors. Ensuring that there is sufficient investment to maintain high standards of infrastructure and conservation is essential to meet the needs of both visitors and the environment.

These challenges highlight the complexity of promoting sustainable outdoor recreation in Ireland. Addressing them requires a multifaceted approach, including better education, more effective communication, enhanced infrastructure, and continued collaboration between public agencies, private landowners, and the broader community. Only through these combined efforts can Ireland's natural beauty be preserved for future generations while allowing for continued public enjoyment of its outdoor spaces.

Local Assessment

Key Performance Indicators (KPIs)

To determine Key Performance Indicators (KPIs) for the communication and facilitation of best practices in outdoor recreation in Ireland, you will want to follow a structured approach. Here are steps to identify relevant KPIs:

1. Identify the Objectives

- *Define Goals: Start by clearly defining the goals of your outdoor recreation program or initiative. These might include promoting sustainable practices, reducing environmental impact, improving visitor experiences, or increasing public awareness.*
- *Align with Policies: Ensure that your objectives align with national policies and strategies, such as the National Outdoor Recreation Strategy, Biodiversity Action Plan, or the principles of Leave No Trace Ireland.*

2. Determine Key Areas of Measurement

- *Visitor Engagement and Education: KPIs could measure the effectiveness of educational campaigns, workshops, or online content aimed at promoting best practices.*

- *Environmental Impact: These KPIs might focus on the reduction of litter, preservation of trails, or protection of sensitive habitats.*
- *Access and Infrastructure: Measure the adequacy and condition of recreational infrastructure, such as trails, signage, and visitor facilities.*
- *Stakeholder Collaboration: Evaluate the level of cooperation and satisfaction among stakeholders, including government agencies, landowners, and environmental groups.*
- *Visitor Satisfaction: Assess how well visitor needs are met and how their experiences align with the goals of sustainability.*

3. Consult Existing Frameworks and Standards

- *National and International Benchmarks: Review KPIs used by similar initiatives in other regions or countries, as well as those recommended by Irish governmental bodies or international organizations focused on outdoor recreation and conservation.*
- *Environmental Standards: Look at KPIs linked to environmental standards, such as reductions in carbon footprint, biodiversity indices, or compliance with Leave No Trace principles.*

4. Engage with Stakeholders

- *Surveys and Feedback: Conduct surveys with visitors, landowners, and other stakeholders to understand what aspects are most important to them and where improvements are needed. This feedback can help identify which KPIs are most relevant.*
- *Workshops and Consultations: Hold workshops or consultations with stakeholders to discuss potential KPIs, ensuring they are practical and aligned with shared goals.*

5. Set Specific, Measurable, Achievable, Relevant, Time-bound (SMART) KPIs

- *Specific: Ensure each KPI is well-defined and focuses on a particular aspect of your objectives.*
- *Measurable: KPIs should be quantifiable, with clear metrics that allow for tracking progress.*
- *Achievable: Set realistic targets that can be reached within the given resources and timeframe.*
- *Relevant: Ensure the KPIs directly support your overall objectives and have a meaningful impact.*
- *Time-bound: Establish a timeline for achieving each KPI to maintain focus and momentum.*

6. Monitor and Review Regularly

- *Data Collection: Implement systems for regular data collection related to your KPIs, such as visitor numbers, survey results, or environmental impact assessments.*
- *Reporting: Develop regular reports to track progress against your KPIs. This could involve quarterly reviews or annual reports.*
- *Continuous Improvement: Use the data collected to refine your strategies and update KPIs as necessary to reflect changing conditions or new priorities.*

Roadmap for action

- *Visitor Engagement: Number of visitors who participate in Leave No Trace workshops or online educational programs.*
- *Environmental Impact: Percentage reduction in litter or erosion in key areas compared to baseline data.*

- *Infrastructure: Percentage of trails maintained to a high standard or the number of new sustainable facilities installed.*
- *Satisfaction Levels: Visitor satisfaction scores collected through surveys, particularly concerning their experience with the environment and facilities.*
- *Stakeholder Collaboration: Number of successful partnerships or collaborative projects initiated.*

By following these steps, you can develop a set of KPIs that effectively measure the success of your initiatives in promoting and facilitating best practices in outdoor recreation in Ireland.

Suggested Actions

1. Strengthen Public Awareness Campaigns

Expand Digital Outreach: Increase the reach and effectiveness of digital platforms by creating engaging and interactive content tailored for various audiences. Develop targeted social media campaigns, educational videos, and virtual reality experiences that highlight best practices and the impact of outdoor activities on the environment. Leverage popular influencers and outdoor enthusiasts to amplify messages.

Enhance Signage and Interpretation: Upgrade and standardize signage across popular recreational areas. Ensure signs are clear, informative, and visually appealing to grab attention and convey key messages. Incorporate interactive elements such as QR codes linking to online resources for detailed information on best practices.

Develop Comprehensive Workshops and Training: Implement a series of workshops and training sessions focused on sustainable outdoor practices. Collaborate with educational institutions, outdoor clubs, and community groups to reach a diverse audience. Provide certification programs for outdoor leaders and guides to ensure they have the knowledge and skills to promote best practices effectively.

2. Improve Infrastructure and Resource Allocation

Invest in Sustainable Infrastructure: prioritize funding for the development and maintenance of sustainable recreational infrastructure. This includes constructing durable trails, installing eco-friendly facilities, and creating designated areas to minimize environmental impact. Ensure that infrastructure upgrades are in line with conservation goals and are capable of handling increased visitor numbers.

Enhance Visitor Management Systems: Implement systems to manage visitor flow and reduce overcrowding in popular areas. Use real-time data to monitor visitor numbers and adjust access or develop reservation systems during peak times to prevent overuse of sensitive areas.

Support Ecosystem Protection Initiatives: Invest in conservation projects that protect and restore ecologically sensitive areas impacted by recreational activities. This includes habitat restoration, erosion control measures, and wildlife monitoring programs.

3. Foster Collaboration and Stakeholder Engagement

Strengthen Partnerships: Enhance collaboration with stakeholders, including government agencies, local communities, landowners, and environmental organizations. Establish regular meetings or forums to discuss challenges, share best practices, and coordinate efforts. Develop joint initiatives that align with national strategies and address local needs.

Create Incentive Programs: Develop incentive programs to encourage landowners and local businesses to support sustainable outdoor recreation practices. This could include financial support, recognition awards, or technical assistance for implementing best practices on private lands.

Engage in Public Consultation: Conduct regular consultations with the public to gather feedback on outdoor recreation practices and policies. Use surveys, focus groups, and community meetings to understand visitor preferences and address concerns related to access, conservation, and infrastructure.

4. Enhance Monitoring and Evaluation

Implement Robust KPI Systems: Develop and implement a comprehensive set of Key Performance Indicators (KPIs) to measure the effectiveness of communication strategies and best practice facilitation. Ensure KPIs are SMART (Specific, Measurable, Achievable, Relevant, Time-bound) and cover areas such as visitor engagement, environmental impact, infrastructure quality, and stakeholder collaboration.

Conduct Regular Assessments: Perform regular assessments of the effectiveness of communication strategies and the state of outdoor recreation areas. Use data collected from visitor surveys, environmental monitoring, and infrastructure evaluations to identify trends, measure progress, and make informed decisions.

Promote Transparency and Accountability: Publish regular reports on the progress of outdoor recreation initiatives, including successes, challenges, and areas for improvement. Ensure these reports are accessible to the public and stakeholders to build trust and encourage community involvement in maintaining best practices.

5. Address Public Behaviour and Awareness

Enhance Educational Materials: Develop and distribute clear, practical educational materials that emphasize the importance of sustainable practices and the impact of individual behaviour on the environment. Use multiple formats such as brochures, infographics, and interactive web tools to reach a broad audience.

Promote Responsible Behaviour: Launch campaigns that focus on changing public behaviour through positive reinforcement and peer influence. Highlight stories of individuals and groups demonstrating exemplary outdoor practices and the benefits of such behaviours.

Enforce Guidelines and Regulations: Work with local authorities to enforce outdoor recreation guidelines and regulations. Implement a system of fines or penalties for non-compliance where necessary and ensure that enforcement actions are fair and consistent.

By focusing on these strategic actions, Ireland can effectively communicate and facilitate best practices in outdoor recreation, balancing the growth in recreational activities with the need to preserve its natural landscapes for future generations.

References

BOOKS:

Brown, Brené (2018). Dare to Lead: Brave Work. Tough Conversations. Whole Hearts. Vermilion, London

Moser, Susanne C & Dilling, Lisa (2007). Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change. Cambridge University Press

Thich Nhat Hanh (2013). The Art of Communicating. Rider Books

Vogl, Charles (2016). The Art of Community: Seven Principles for Belonging. Berrett-Koehler Publishers

PAPERS:

Devaney, L., Torney, D., Brereton, P. & Coleman, M. (2020). Ireland's citizens' assembly on climate change: Lessons for deliberative public engagement and communication. Environmental Communication, Volume 14, Issue 2, 2020

Harvey B, Ensor J, Carlile L, Garside B, Patterson Z, Naess LO. 2012. Climate change communication and social learning–Review and strategy development for CCAFS. CCAFS Working Paper No. 22. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), Copenhagen, Denmark.

McKenzie, M. (2019). Climate change education and communication in global review: Tracking progress through national submissions to the UNFCCC Secretariat. Environmental Education Research, Vol. 25, Issue 5, 2021

Robertson, T., Docherty, P., Millar, F., Ruck, A. & Engstrom, S. (2021). Theory and practice of building community resilience to extreme events. International Journal of Disaster Risk Reduction. Volume 59, 1 June 2021, 102253 2021 – Elsevier

Further reading

Communication on the European Green Deal. (n.d.). European Commission. https://commission.europa.eu/publications/communication-european-green-deal_en

European Movement International. (2023, July 7). How to communicate the EU Green Deal beyond our base [Video]. YouTube. https://www.youtube.com/watch?v=XD4UwubBJ_o

Morning, J. (2024, September 26). What is the European Green Deal? Spunout. https://spunout.ie/life/climate/european-green-deal/?gad_source=1&gclid=Cj0KCQjwjLGyBhCYARIsAPqTz1-ximNjLh5re_haslORTG6-Nu7KmbMuP_NVXS0NHyvZ44ElfLC-MVcaAl_-EALw_wcB

Module 2

Social Engagement and the Development of Environmental Ethics

Ivana Connor and Dr Karina Dingerkus

Key-words

Social engagement
Language
Collaboration
Empowerment
Communication
Inclusion
Leave No Trace
Environmental Ethics

EU Green Deal

Climate; Environment and Agriculture

Targeted SDGs

#3, #5, #8, #9, #11, #13, #15, #16 and #17

Summary

Environmental ethics is a field that examines the moral relationship between humans and the natural world. It highlights the intrinsic value of nature, recognising that all living things are interconnected and that our actions can have significant impacts on the environment. This area of study encourages a shift in perspective, promoting a sense of responsibility and stewardship towards the planet.

Central to environmental ethics is the idea that humans should aim for a balanced and respectful relationship with nature. It stresses the importance of understanding how our daily choices and behaviours affect ecosystems and biodiversity. Through education and awareness, individuals are empowered to make decisions that minimise environmental harm and support sustainability. By fostering a deeper connection with the natural world, environmental ethics seeks to guide us towards more responsible and respectful interactions with our planet.

The module on Social Engagement and the Development of Environmental Ethics comprises four units:

1

Introduction to Leave No Trace and Environmental Ethics

This unit will examine Leave No Trace Ireland and the development of an environmental ethics programme.

2

Training and Communication

This unit will feature practical training which Leave No Trace Ireland uses to build an environmental ethic and empower communities.

3

What is Social Engagement

This module will examine Social Engagement and its use to facilitate positive environmental change. The module will also explore the determinants of behaviour.

4

Case Studies and Reflection

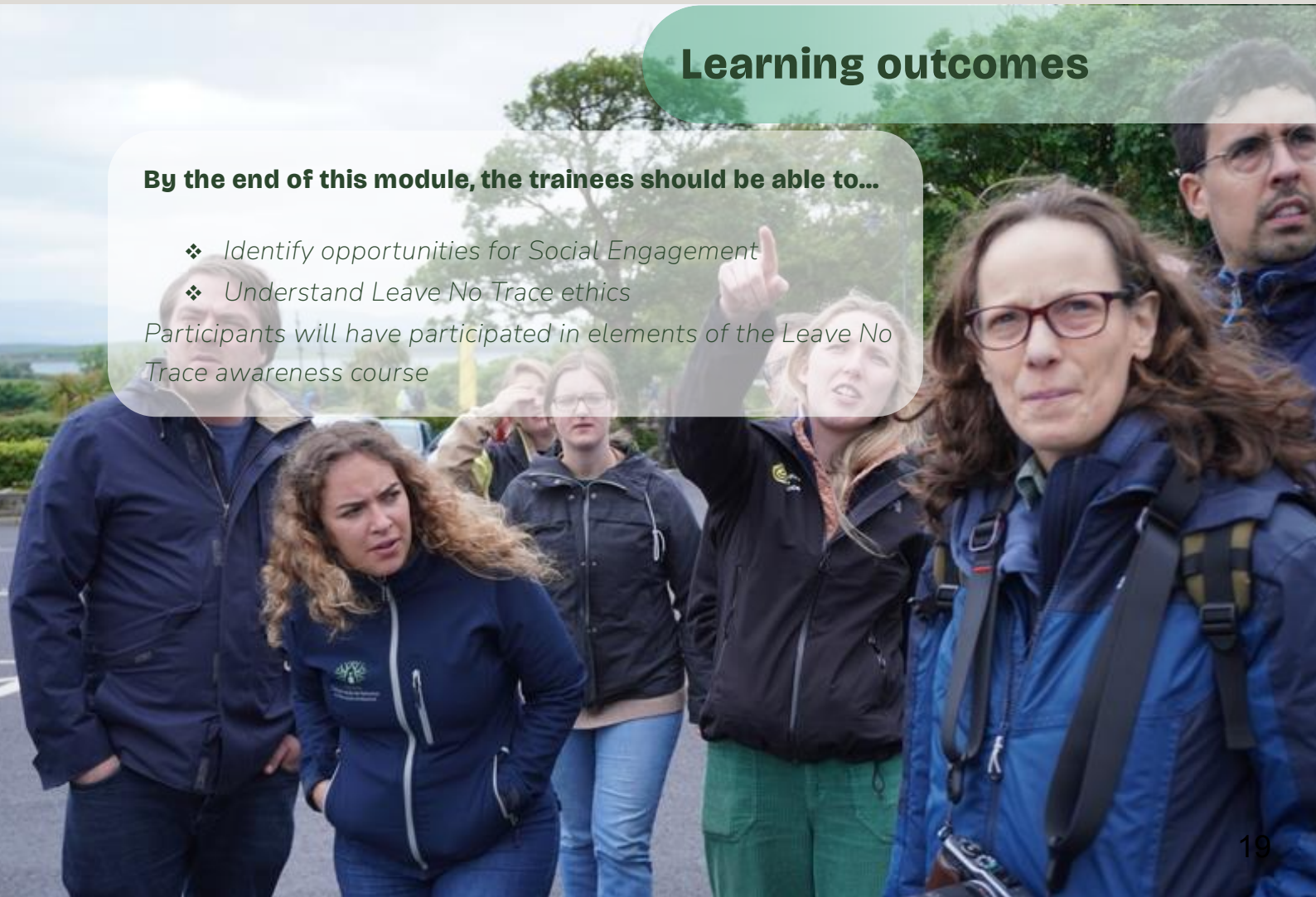
The final unit will feature case studies where Leave No Trace Ireland has led social engagement initiatives. Lessons learned and reflections will be incorporated.

Learning outcomes

By the end of this module, the trainees should be able to...

- *Identify opportunities for Social Engagement*
- *Understand Leave No Trace ethics*

Participants will have participated in elements of the Leave No Trace awareness course



Module content

Introduction

Environmental ethics looks to understand human responsibility to protect the environment/nature. It recognises the intrinsic value of nature and how all living things are connected.

In more recent years, the disconnect between humans and environment/nature has increased. It is important to try and reform these connections through social engagement, so people understand the destructive nature of our actions, for example in relation to climate change.

Leave No Trace Ireland provides research, education, and outreach so every person who goes outdoors can protect and enjoy the environment responsibly. Leave No Trace aims to limit the impacts that come with the increased recreational use of our outdoor spaces. They have developed programmes such as the "Love This Place" campaign to encourage people to respect their environment.

The main Leave No Trace programme is based on seven principles of environmental ethics. These Seven Principles provide an easily understood framework of minimum impact practices for anyone visiting the outdoors. Although Leave No Trace has its roots in the countryside, the Seven Principles have been adapted so that they can be applied anywhere — from remote areas, to local parks and local neighbourhoods. They can also apply to almost every recreational activity. Each Principle covers a specific topic and provides detailed information for minimising impacts.

The seven principles are:

1. *Plan Ahead and Prepare*
1. *Be Considerate of Others*
2. *Respect Farm Animals and Wildlife*
3. *Travel and Camp Responsibly*
4. *Leave What You Find*
5. *Dispose of Waste Properly*
6. *Protect Nature From Fire*
7. *Minimise the Effects of Fire*

State of the art

The intersection of social engagement and environmental ethics has increasingly become a focal point in policy discussions at both global and local levels, particularly as the climate crisis grows more severe. In Ireland, this convergence is exemplified by a detailed policy framework that underscores the significance of civic participation, community involvement, and ethical management of environmental resources (Moore, 2022). As environmental challenges intensify, the ethical dimensions of human interactions with nature are coming to the forefront (Schlosberg, 2021). This review explores the current landscape of social engagement in Ireland in relation to the evolution of environmental ethics, focusing on key policies, practices, and public perceptions that shape this domain.

Environmental ethics concerns the moral relationship between humans and the natural environment, emphasising principles such as sustainability, stewardship, and justice (McCormick, 2023). In Ireland, these ethical considerations have been progressively integrated into national policy frameworks, reflecting the country's commitment to both international obligations and domestic priorities (Williams, 2023).

National Policy Frameworks

Ireland has developed several significant policy documents that incorporate environmental ethics, demonstrating a clear understanding of the moral imperatives involved in addressing environmental issues (Salamon, 2023).

Climate Action Plan 2023

The Climate Action Plan 2023 is a cornerstone of Ireland's environmental strategy, outlining the nation's path towards achieving net-zero emissions by 2050. This plan underscores the ethical imperatives of intergenerational equity and the precautionary principle, acknowledging the moral responsibility to safeguard future generations from the detrimental effects of climate change (McCarthy, 2022). It also highlights the need for a just transition, ensuring that the shift towards a low-carbon economy does not disproportionately affect vulnerable communities. By embedding these ethical principles, the plan reflects a commitment to long-term sustainability and social justice (Schlosberg, 2021).

National Biodiversity Action Plan

Ireland's National Biodiversity Action Plan exemplifies the country's dedication to preserving its rich natural heritage. Aligned with the EU Biodiversity Strategy, this plan integrates ethical considerations such as the intrinsic value of nature and the duty to protect ecosystems not merely for their utility to humans but for their own sake (Johnson, 2021). The plan is a testament to the recognition of biodiversity as a public good that requires protection and restoration. By prioritising the conservation of habitats and species, Ireland is acknowledging the moral responsibility to maintain the natural balance that supports all life forms (Williams, 2023).

Incorporating Leave No Trace Principles into Policy

The principles advocated by Leave No Trace have increasingly permeated national and local policies, particularly in areas related to outdoor recreation and tourism. These principles are evident in guidelines for sustainable tourism, where minimising environmental impact is a key objective. Leave No Trace Ireland has collaborated with governmental bodies to promote education and awareness programmes that align with national environmental goals, reinforcing the ethical dimensions of conservation and responsible land use (McCormick, 2023). This integration demonstrates a commitment to fostering a culture of environmental respect and responsibility, aligning individual actions with broader ethical goals (Salamon, 2023).

International Commitments

Ireland's approach to environmental ethics is also shaped by its adherence to international commitments, which provide a broader ethical framework for national policies (Johnson, 2021).

The Paris Agreement

Ireland's ratification of the Paris Agreement marks its commitment to global environmental ethics. The country's climate policies are framed within the ethical obligations to reduce greenhouse gas emissions and to support adaptation efforts in vulnerable regions worldwide. This commitment reflects an understanding of the global nature of the climate crisis and the shared responsibility to mitigate its effects (McCarthy, 2022). Ireland's participation in the Paris Agreement underscores its recognition of the interconnectedness of global ecosystems and the moral duty to contribute to global sustainability efforts (Salamon, 2023).

UN Sustainable Development Goals (SDGs)

Ireland's environmental policies are further informed by the United Nations Sustainable Development Goals (SDGs), particularly Goal 13 (Climate Action) and Goal 15 (Life on Land). These goals provide a comprehensive ethical framework that emphasises the interdependence of environmental, social, and economic sustainability. By integrating the SDGs into its national policies, Ireland is aligning its efforts with a global vision for sustainable development that considers the long-term impacts of current actions (Williams, 2023). This alignment reflects a commitment to ethical principles that transcend national borders, acknowledging the universal nature of environmental responsibility (McCormick, 2023).

Public Perception and Media

Public engagement and media coverage play crucial roles in shaping and reflecting the ethical discourse around environmental issues in Ireland.

Media Coverage

Irish media has increasingly focused on environmental issues, often framing them within ethical discussions about individual, corporate, and governmental responsibilities. Media coverage frequently highlights the moral implications of environmental decisions and their impacts on communities and ecosystems. This framing has been instrumental in raising public awareness and fostering a national dialogue about the ethical dimensions of environmental stewardship. However, there is still a need for more consistent and in-depth reporting to enhance public understanding and engagement with environmental ethics. The media's role is critical in ensuring that the public is not only informed but also motivated to participate in the ethical stewardship of the environment.

Public Opinion

Surveys and studies indicate that environmental concerns are becoming increasingly important to the Irish public. There is a growing recognition of the ethical dimensions of issues like climate change, resource depletion, and biodiversity loss. Public opinion increasingly supports measures that align with ethical principles of sustainability and justice. This shift in attitudes reflects a broader societal commitment to integrating environmental ethics into daily life and policy. The increasing public support for environmentally responsible policies and practices suggests that ethical considerations are becoming more deeply embedded in the collective consciousness. This shift is evident in the growing number of grassroots movements and community initiatives focused on environmental protection and sustainability.

Academic Contributions and Civic Engagement

The development of environmental ethics in Ireland is also shaped by contributions from academia and civic engagement.

Academic Research

Irish academia has made significant contributions to the discourse on environmental ethics. Researchers in various fields, including environmental science, philosophy, and social studies, have explored the ethical implications of environmental policies and practices. Academic institutions have played a vital role in fostering a deeper understanding of environmental ethics, providing theoretical frameworks that inform policy decisions and public debates. This research has also highlighted the need for interdisciplinary approaches to address complex environmental challenges, combining insights from ethics, science, and social policy.

Civic Engagement

Civic engagement in Ireland has been a driving force behind the integration of environmental ethics into public policy. Environmental NGOs, community groups, and activist movements have been instrumental in advocating for stronger environmental protections and ethical considerations in policy-making. These groups have engaged in various activities, from grassroots campaigns to policy advocacy, helping to shape the national agenda on environmental issues. Their efforts have contributed to a more inclusive and participatory approach to environmental governance, ensuring that ethical concerns are reflected in both policy and practice.

The state of environmental ethics in Ireland is characterised by a strong alignment between national policies, public engagement, and international commitments. Through comprehensive policy frameworks like the Climate Action Plan and the National Biodiversity Action Plan, Ireland has demonstrated a commitment to integrating ethical principles into its environmental strategies. Media coverage and public opinion further reflect a growing awareness and acceptance of the ethical dimensions of environmental issues. Academic research and civic engagement continue to play crucial roles in advancing the discourse and ensuring that ethical considerations are central to Ireland's approach to environmental stewardship. As Ireland moves forward, the continued integration of environmental ethics into policy and practice will be essential in addressing the complex challenges posed by the climate crisis and in achieving long-term sustainability.

Challenges

Despite significant progress in environmental ethics and social engagement in Ireland, several challenges persist. These challenges complicate the effective implementation of ethical principles and highlight the complexities of aligning ideals with practical realities.

1. Implementation Gaps

Policy Enactment and Enforcement

One of the primary challenges is the gap between ambitious environmental policies and their actual implementation. While Ireland has developed comprehensive climate action plans with goals like achieving net-zero emissions by 2050, translating these plans into concrete actions is often slow and fraught with difficulties. The complexity of implementing policies across various sectors—such as energy, transportation, and agriculture—can lead to delays and partial measures that fall short of the original objectives. Furthermore, enforcement mechanisms may lack robustness, leading to inconsistencies and insufficient progress.

Economic Pressures

Economic factors also pose significant challenges. The transition to a more sustainable economy often requires substantial investment and can disrupt established industries. For example, shifting away from fossil fuels impacts sectors such as agriculture and manufacturing, which are central to Ireland's economy. Balancing economic growth with environmental sustainability requires careful planning and support for affected industries and communities. The financial burden of implementing green technologies and practices can be a barrier, particularly for small businesses and low-income households.

2. Equity Concerns

Disproportionate Impacts

Environmental policies can sometimes disproportionately affect different social groups. Rural communities, for instance, may experience more significant impacts from changes in agricultural practices or energy policies than urban areas. These groups might face higher costs or reduced access to resources, raising concerns about fairness and equity. Ensuring that policies are inclusive and consider the needs of all communities is crucial, but achieving this balance can be challenging.

Social Justice Issues

The intersection of environmental ethics with social justice highlights the need to address not only environmental but also socio-economic inequalities. Environmental policies that fail to consider the broader context of social justice may inadvertently exacerbate existing disparities. For example, while initiatives to reduce carbon footprints are essential, they must be designed in a way that supports vulnerable populations and provides equitable access to green technologies and benefits.

3. Public Engagement and Awareness

Education and Awareness

Increasing public awareness and engagement with environmental ethics remains a challenge. Despite growing concern about climate change and sustainability, there is often a gap between awareness and actionable behaviour. Educating the public about the ethical dimensions of environmental issues and how they can make a difference is essential. However, effective communication strategies are needed to translate complex scientific and ethical concepts into practical, relatable actions.

Media Influence

The role of the media in shaping public perceptions of environmental issues is significant but can be inconsistent. While media coverage of environmental topics has increased, it can sometimes be sensationalised or lack depth. This can lead to public confusion or disengagement from the underlying ethical issues. Ensuring accurate, balanced, and comprehensive reporting is crucial for fostering informed public discourse and motivating meaningful action.

4. Political and Institutional Challenges

Policy Coherence

Achieving policy coherence across different levels of government and between various sectors is a persistent challenge. Environmental policies often intersect with economic, social, and health policies, requiring coordinated efforts and integrated approaches. Disparities between local, national, and European Union policies can create inconsistencies and hinder progress.

Political Will and Lobbying

Political will is essential for advancing environmental ethics, but it can be undermined by lobbying from vested interests that may resist stringent environmental regulations. Balancing competing interests and ensuring that ethical considerations are prioritised in policy decisions is a complex task. Effective advocacy and transparent decision-making processes are needed to overcome these challenges.

The development of environmental ethics in Ireland faces a range of challenges, including gaps in policy implementation, economic pressures, equity concerns, and issues of public engagement. Addressing these challenges requires a multifaceted approach that includes robust policy frameworks, equitable solutions, effective public education, and political commitment. Overcoming these obstacles is crucial for ensuring that Ireland can fully realise its ethical commitments to environmental sustainability and social justice.

Local Assessment

Key Performance Indicators (KPIs)

1. Greenhouse Gas Emissions Reduction

Target: *Ireland's Climate Action Plan 2023 sets an ambitious goal to reduce greenhouse gas (GHG) emissions by 51% by 2030 relative to 2018 levels, aiming for net-zero emissions by 2050. This is a critical part of Ireland's strategy to meet the broader EU targets for climate action (Mason Hayes Curran).*

Performance: *Current measures are projected to achieve only a 9% reduction by 2030. With the implementation of additional policies, this could increase to a 25% reduction, which still falls short of the 42% reduction target mandated under the EU Effort Sharing Regulation (ESR) (Home).*

2. Renewable Energy Deployment

Target: *The Climate Action Plan 2023 targets increasing the share of renewable electricity to 80% by 2030. This goal includes significant expansion in offshore wind and solar capacities (Mason Hayes Curran).*

Performance: *As of 2022, Ireland connected 1,836 MW of renewable generation capacity to the grid, representing a 20% increase in renewable electricity capacity. This expansion reflects Ireland's ongoing efforts to transition to a more sustainable energy mix (Home).*

3. Biodiversity Preservation

Target: *The National Biodiversity Action Plan outlines the goal of increasing annual afforestation to 8,000 hectares from 2023 onwards, as part of broader efforts to preserve and restore biodiversity (Home).*

Performance: *While there are ongoing efforts, challenges remain in achieving the afforestation targets and effectively implementing biodiversity conservation measures. These challenges underscore the need for sustained efforts in habitat restoration and sustainable land management (Mason Hayes Curran).*

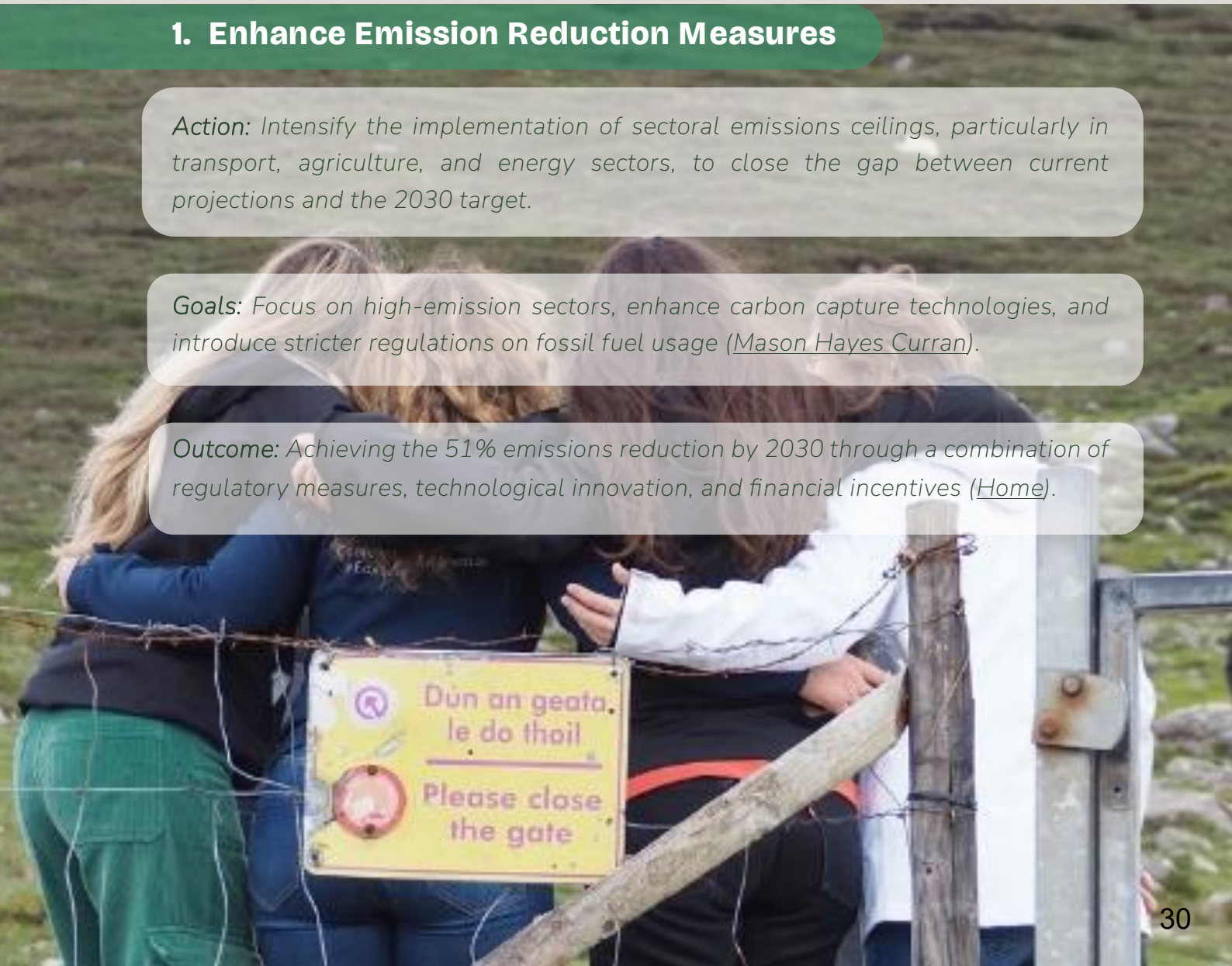
Roadmap for action

1. Enhance Emission Reduction Measures

Action: *Intensify the implementation of sectoral emissions ceilings, particularly in transport, agriculture, and energy sectors, to close the gap between current projections and the 2030 target.*

Goals: *Focus on high-emission sectors, enhance carbon capture technologies, and introduce stricter regulations on fossil fuel usage (Mason Hayes Curran).*

Outcome: *Achieving the 51% emissions reduction by 2030 through a combination of regulatory measures, technological innovation, and financial incentives (Home).*



2. Accelerate Renewable Energy Transition

Action: Expand offshore wind capacity and other renewable sources to meet the 80% renewable electricity target by 2030. Support the deployment of projects approved under the Renewable Electricity Support Scheme (RESS) (Mason Hayes Curran).

Goals: Streamline permitting processes, increase investment in grid infrastructure, and incentivize private sector participation in renewable energy projects (Home).

Outcome: Securing a resilient and sustainable energy supply, significantly reducing dependence on fossil fuels and lowering national GHG emissions (Mason Hayes Curran) (Home).

3. Strengthen Biodiversity Initiatives

Action: Implement the National Biodiversity Action Plan with a focus on rewilding, habitat restoration, and sustainable land management practices. Increase public and private sector participation in afforestation and conservation projects (Home).

Goals: Achieve the afforestation target of 8,000 hectares annually, protect critical habitats, and enhance biodiversity monitoring systems (Mason Hayes Curran).

Outcome: Preserving Ireland's natural heritage, ensuring long-term ecological stability, and meeting EU biodiversity targets (Home).

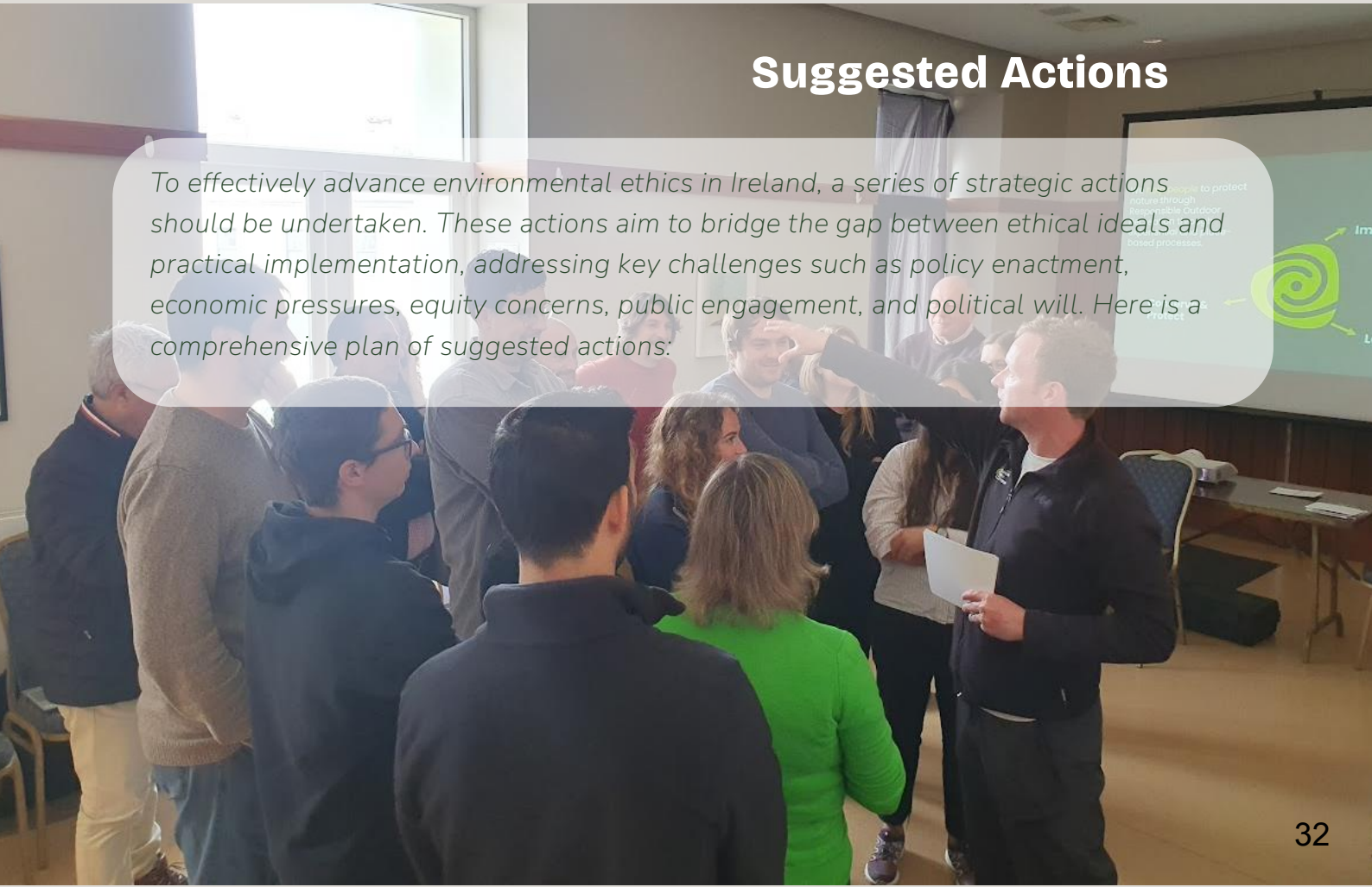
4. Foster Public Engagement and Education

Action: *Launch comprehensive public awareness campaigns on environmental ethics, focusing on individual responsibility and the benefits of sustainable practices (Mason Hayes Curran).*

Goals: *Increase public participation in climate action initiatives, promote behavioural changes, and build a culture of environmental stewardship (Home).*

Outcome: *A well-informed and engaged public, actively contributing to national sustainability goals through everyday actions and community-based projects (Home).*

This roadmap, grounded in these KPIs, provides a structured approach for Ireland to advance its environmental ethics and social engagement objectives. By setting clear targets and implementing robust action plans, Ireland can drive progress toward its climate and environmental goals while ensuring accountability and broad public involvement.



Suggested Actions

To effectively advance environmental ethics in Ireland, a series of strategic actions should be undertaken. These actions aim to bridge the gap between ethical ideals and practical implementation, addressing key challenges such as policy enactment, economic pressures, equity concerns, public engagement, and political will. Here is a comprehensive plan of suggested actions:

1. Strengthening Policy Frameworks

Action: *Develop and implement robust environmental regulations that align with ethical principles. This includes setting stricter emissions standards, promoting sustainable land use, and incentivising green technologies.*

Details: *Establish clear, enforceable guidelines for reducing greenhouse gas emissions and transitioning to renewable energy sources. Implement regular reviews to ensure compliance and adjust policies based on performance and emerging scientific data. This action should also involve updating land use policies to protect natural habitats and enhance biodiversity.*

2. Enhancing Public Engagement and Education

Action: *Launch comprehensive environmental education programmes and public awareness campaigns. These initiatives should focus on the ethical implications of environmental actions and promote sustainable lifestyles.*

Details: *Develop educational materials for schools that integrate environmental ethics into science and social studies curricula. Implement community outreach programmes that include workshops, seminars, and interactive events to engage the public. Partner with media organisations to increase the visibility of environmental issues and ethical considerations.*

3. Promoting Sustainable Business Practices

Action: *Create incentives and certification schemes for businesses adopting sustainable practices. Support the transition to greener technologies and sustainable supply chains.*

Details: *Develop a certification programme for businesses that meet sustainability criteria, offering financial incentives, such as tax breaks or grants, for certification. Provide training and resources to help businesses implement sustainable practices, including energy efficiency measures and waste reduction strategies. Highlight success stories to encourage wider adoption.*

4. Addressing Equity and Inclusivity

Action: *Ensure that environmental policies and programmes are designed with equity considerations in mind, addressing the needs of vulnerable and disadvantaged communities.*

Details: *Conduct impact assessments to understand how environmental policies affect different socio-economic groups. Develop targeted support programmes for communities that may face higher costs or disadvantages due to environmental regulations. Foster community involvement in policy development to ensure diverse perspectives are considered.*

5. Increasing Investment in Renewable Energy

Action: *Boost investment in renewable energy infrastructure and technologies. Support innovation and research in green energy solutions.*

Details: *Allocate funding for the development and expansion of renewable energy projects, such as wind, solar, and hydropower. Facilitate public-private partnerships to drive innovation in clean energy technologies. Provide subsidies or low-interest loans to households and businesses that invest in renewable energy systems.*

6. Strengthening Political and Institutional Commitment

Action: *Build political will and institutional capacity to support the ethical integration of environmental policies. Promote transparency and accountability in environmental governance.*

Details: *Engage policymakers in dialogue about the importance of environmental ethics and secure commitments to prioritise sustainability in decision-making. Establish independent bodies to monitor and report on environmental policy implementation and effectiveness. Encourage citizen participation in environmental governance to ensure that policies reflect public values and concerns.*

Implementing these actions will be crucial for advancing environmental ethics in Ireland. By strengthening policy frameworks, enhancing public engagement, promoting sustainable business practices, addressing equity, increasing investment in renewable energy, and strengthening political commitment, Ireland can make meaningful progress in aligning ethical principles with practical environmental actions. Regular evaluation and adaptation of these strategies will ensure continued progress and effectiveness in addressing environmental challenges.

References

BOOKS:

Gardiner, Stephen M. (ed.) and Thompson Allen (ed.) (2015). The Oxford Handbook of Environmental Ethics, Oxford University Press

Attfield, R. (2018). Environmental Ethics: A Very Short Introduction, Oxford Press

Rolston, Holmes (2020). A New Environmental Ethics. The Next Millennium for Life on Earth. Routledge, New York

PAPERS:

Ducarme, F., Couvet, D. What does 'nature' mean?. Palgrave Commun 6, 14 (2020)

Schlosberg, D. Environmental Ethics and Policy: The Role of the Policy Framework in Shaping Environmental Decisions. Environ. Polit. (2021).

Moore, N. Integrating Environmental Ethics into Climate Policy: The Case of Ireland. Irish Geogr. (2022).

McCormick, R. The Role of Social Engagement in Environmental Policy Development: Lessons from Ireland. J. Environ. Policy Plan. (2023).

Salamon, M. K. Ethical Dimensions of Climate Action: Comparative Policy Approaches. Climate Policy (2023).

Johnson, C. Biodiversity Conservation and Ethical Policy: The Role of National Action Plans. Biodivers. Conserv. (2021).

McCarthy, F. The Paris Agreement and Global Environmental Ethics: Ireland's Commitment and Implementation. Glob. Environ. Change (2022).

Williams, A. The Influence of the UN Sustainable Development Goals on National Environmental Policies. Sustain. Dev. (2023).

Further reading

Beaches & Dunes. (n.d.). Beaches & Dunes - For Climate Action. Beaches & Dunes. https://dunes.ie/
Leave No Trace Ireland. (2024, September 19). Home - Leave No Trace Ireland. https://www.leavenotraceireland.org/

Leave No Trace Ireland. (2024a, February 1). Croagh Patrick Ambassador Programme - Leave No Trace Ireland. https://www.leavenotraceireland.org/about/croaghpatrickambassador/
Llp, M. H. C. (2023, January 20). Ireland's Climate Action Plan – 2023 update. Mason Hayes Curran. https://www.mhc.ie/latest/insights/irelands-climate-action-plan-2023-update

Module 3

Natural capital and cultural heritage

SYNTHESIS Center for Research & Education

Key-words

Cultural heritage sustainable development cultural development.

Targeted SDGs

#11, #12, #13, #14, #15

EU Green Deal

Biodiversity strategy for 2030; Circular economy action plan; Farm to Fork strategy; EU Climate Law and the European Climate Pact; Cultural Heritage Natural Capital; Roadmap

Summary

The objectives of this learning module are to recognise the significance of cultural heritage within the area of a Local authority; learn about cultural heritage and current issues; learn about how sustainable development may help to conserve cultural treasures.

The module on Environmental Education and Social Participation comprises five units:

1. **EU initiatives, policies, and strategies**
2. **EU Natural Capital Preservation Policies and Strategies**

3 EU Policies and Strategies for the Preservation of Cultural Heritage

4 Challenges and threats faced by the European Union

Local context sharing insights as to how to perform a local assessment on natural capital and cultural heritage and directions for creating a roadmap by setting short-term, medium-term and long-term goals.

Learning outcomes

By the end of this module, the trainees should be able to:

- *Comprehend the terms natural capital and cultural heritage*
- *Name the EU policies for preserving natural capital and cultural heritage*
- *Name the challenges the EU faces on preserving natural capital and cultural heritage*
- *Perform a local assessment on natural capital and cultural heritage*

Create a roadmap with short-, medium-, and long-term goals.

Module content

Introduction

In recent years, the importance of sustainability has grown as societies around the world face environmental, economic, and social challenges that threaten the planet's future (United Nations, n.d.). Conservation of cultural heritage is a frequently overlooked aspect of sustainability. This module investigates the connection between natural capital and cultural heritage, as well as their roles in promoting a more sustainable future. Long-term development requires both natural capital and cultural heritage. Natural capital refers to the natural resources and ecosystems that provide humans with a variety of services such as clean air and water, food, and building materials (Costanza et al., 1997). Buildings, landscapes, artefacts, and traditions are examples of tangible and intangible cultural heritage assets passed down through generations (UNESCO, 2003). Because cultural heritage relies on natural resources and ecosystems for preservation and sustainability, natural capital and cultural heritage are inextricably linked.

Natural capital is the stock of natural resources and ecosystems that provide a variety of services to human society, such as provisioning (food, water, and materials), regulating (climate regulation, air and water quality), and cultural (recreation, spiritual, and aesthetic enjoyment) (Costanza et al., 1997). The value of natural capital is based on its ability to support human well-being and economic development (World Bank, 2021). Natural capital, for example, is critical for food and fibre production, as well as supporting industries such as tourism and recreation. Natural capital also provides essential services that benefit human health and well-being, such as climate regulation, air and water quality, and disease vectors (Millennium Ecosystem Assessment, 2005)

Furthermore, investing in natural capital can yield substantial economic benefits. A World Economic Forum study, for example, discovered that investing in nature-based solutions, such as reforestation and wetland restoration, could provide a return on investment of up to $30 for every dollar invested (World Economic Forum, 2020). As a result, protecting and investing in natural capital is critical for achieving the United Nations Sustainable Development Goals (World Bank, 2021).

The physical and intangible aspects of a society's history and traditions are included in cultural heritage. The built environment, natural environment, and artefacts are the three main types of cultural heritage (World Heritage Centre, n.d.). The built environment refers to a community's architectural and engineering achievements, such as buildings, monuments, and other structures. The physical and natural features of a place, such as landscapes, geology, and biodiversity, are all part of the natural environment. Finally, artifacts are portable and transportable objects and collections such as artwork, documents, and archaeological artifacts. These three types of cultural heritage are critical for understanding and preserving a community's history and traditions for future generations (World Heritage Centre, n.d.).

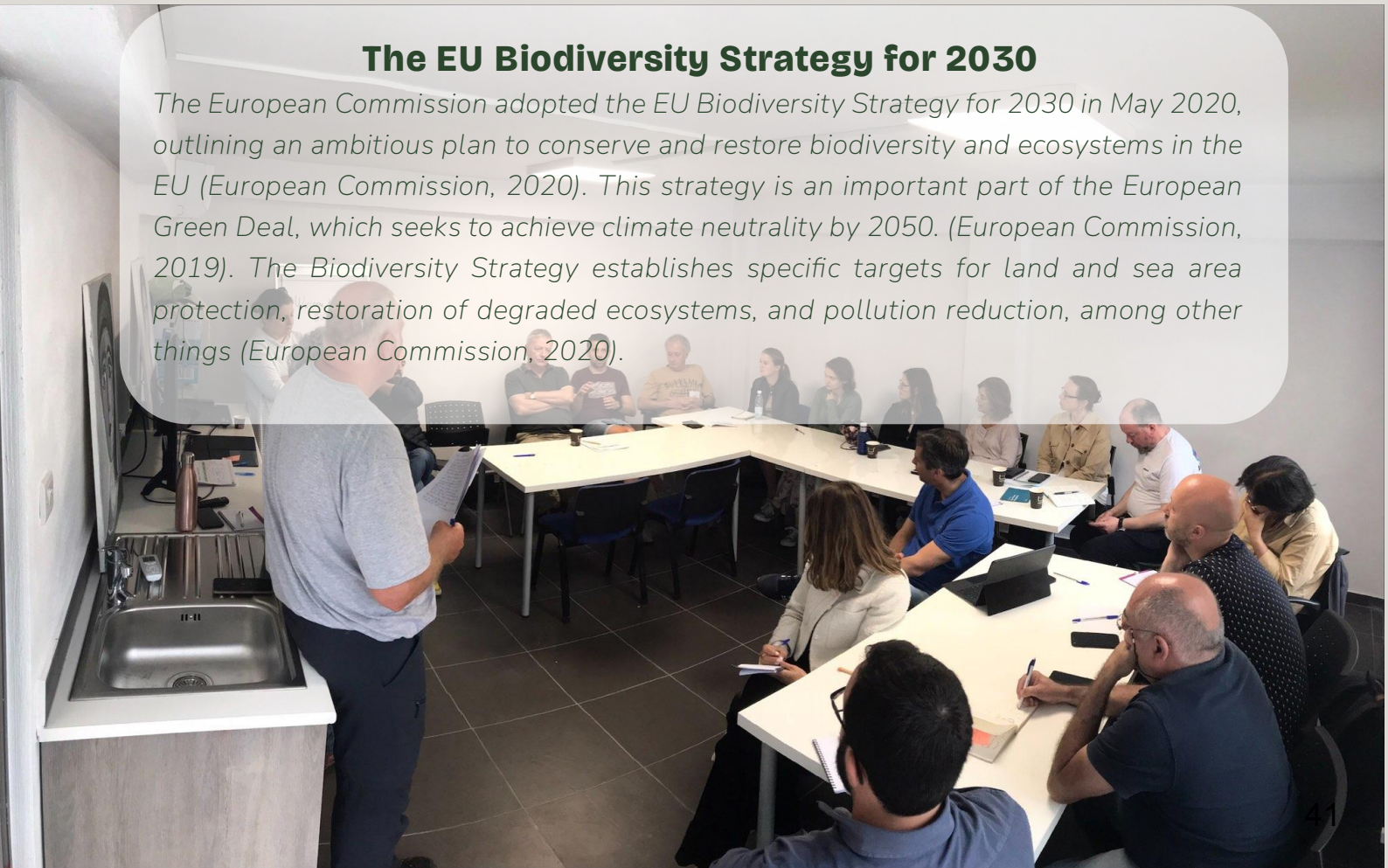
Cultural heritage is an important part of a society's identity because it connects the past, present, and future. Cultural heritage is an important part of our global heritage for several reasons. It gives communities and nations a sense of identity and continuity, fostering a sense of pride and belonging. Cultural heritage also contributes to tourism development, economic growth, and education for future generations. Furthermore, cultural heritage is an irreplaceable resource that represents the diversity of human creativity and imagination.

State of the art

The European Union (EU) is renowned for its abundant natural resources and cultural legacy, both of which are vital for preserving the environment and promoting social and economic well-being. In order to evaluate the current state of knowledge in these fields and to review recent efforts made by the EU to preserve natural capital and cultural heritage, this section of the module will also review those efforts. This section offers a thorough examination of EU initiatives, policies, and strategies that have helped to safeguard the earth's natural resources and cultural heritage. Additionally, it looks at the opportunities and difficulties the EU has to deal with in order to safeguard and conserve these priceless resources for future generations.

Natural capital and cultural heritage are essential resources for the European Union, supporting its economic growth, social cohesion, and environmental sustainability (Costanza et al., 1997; Nijkamp et al., 1999). Acknowledging their intrinsic value and the significance of protecting and preserving them for the continent's identity, diversity, and allure, the EU has made numerous efforts over the years (European Commission, 2018a).

EU Natural Capital Preservation Policies and Strategies



The EU Biodiversity Strategy for 2030

The European Commission adopted the EU Biodiversity Strategy for 2030 in May 2020, outlining an ambitious plan to conserve and restore biodiversity and ecosystems in the EU (European Commission, 2020). This strategy is an important part of the European Green Deal, which seeks to achieve climate neutrality by 2050. (European Commission, 2019). The Biodiversity Strategy establishes specific targets for land and sea area protection, restoration of degraded ecosystems, and pollution reduction, among other things (European Commission, 2020).

Natura 2000 Network

The Natura 2000 Network, which was established in the 1990s, is a cornerstone of the European Union's efforts to preserve natural capital. It is a network of protected areas spread throughout the EU with the goal of conserving habitats and species of European importance (European Commission, 2018b). By 2021, the network will have covered more than 18% of the EU's land area and 10% of its marine territory, making a significant contribution to the preservation of biodiversity and ecosystem services (European Environment Agency, 2021).

Water Framework Directive and Marine Strategy Framework Directive

The EU has implemented the Water Framework Directive (2008/32/EC) and the Marine Strategy Framework Directive (2008/56/EC) to protect and restore water resources and marine ecosystems. These policies aim to ensure that all bodies of water in the EU are in good ecological condition by 2027 and to achieve a healthy marine environment by 2020, respectively (European Commission, n.d.). However, additional efforts are required to fully achieve these objectives and ensure the long-term sustainability of Europe's natural capital.

EU Policies and Strategies for the Preservation of Cultural Heritage

European Year of Cultural Heritage

The 2018 European Year of Cultural Heritage (EYCH) aimed to raise awareness about the importance of cultural heritage and promote its protection, conservation, and long-term use (European Commission, 2018a). Over 23,000 events were held in 37 countries during the EYCH, reaching an estimated 6.2 million people (European Commission, 2019). The implementation of the European Framework for Action on Cultural Heritage, which outlines policy actions for the safeguarding of cultural assets at the European, national, regional, and local levels, was one of the main outcomes of the EYCH (European Commission, 2018c).

Creative Europe Programme

The Creative Europe Programme offers support to the EU's cultural and creative sectors, including the safeguarding and fostering of cultural heritage (European Commission, 2021). Numerous projects focused on the conservation, digitalisation, and accessibility of cultural heritage assets, as well as initiatives aimed at increasing public awareness and engagement with cultural heritage, have received funding through the programme. The programme also aims to promote cross-border cooperation and exchange in the cultural and creative sectors, thereby helping to shape a more cohesive and diverse European cultural identity.

Europa Nostra

Europa Nostra is a pan-European federation of heritage non-governmental organisations (NGOs) dedicated to the preservation of Europe's cultural and natural heritage (Europa Nostra, 2021). Advocacy, education, and networking are among the organization's efforts, as are the European Heritage Awards, which recognise outstanding achievements in cultural heritage conservation, research, and education (European Commission, 2018b).

European Heritage Label

The European Heritage Label (EHL) is a programme that identifies and promotes cultural heritage sites that have played an important role in the development of Europe's shared history and values (European Commission, 2021b). By emphasising the significance of these sites, the EHL fosters a sense of belonging to a shared European identity and encourages cross-cultural dialogue (European Commission, 2021b).

European Heritage Label

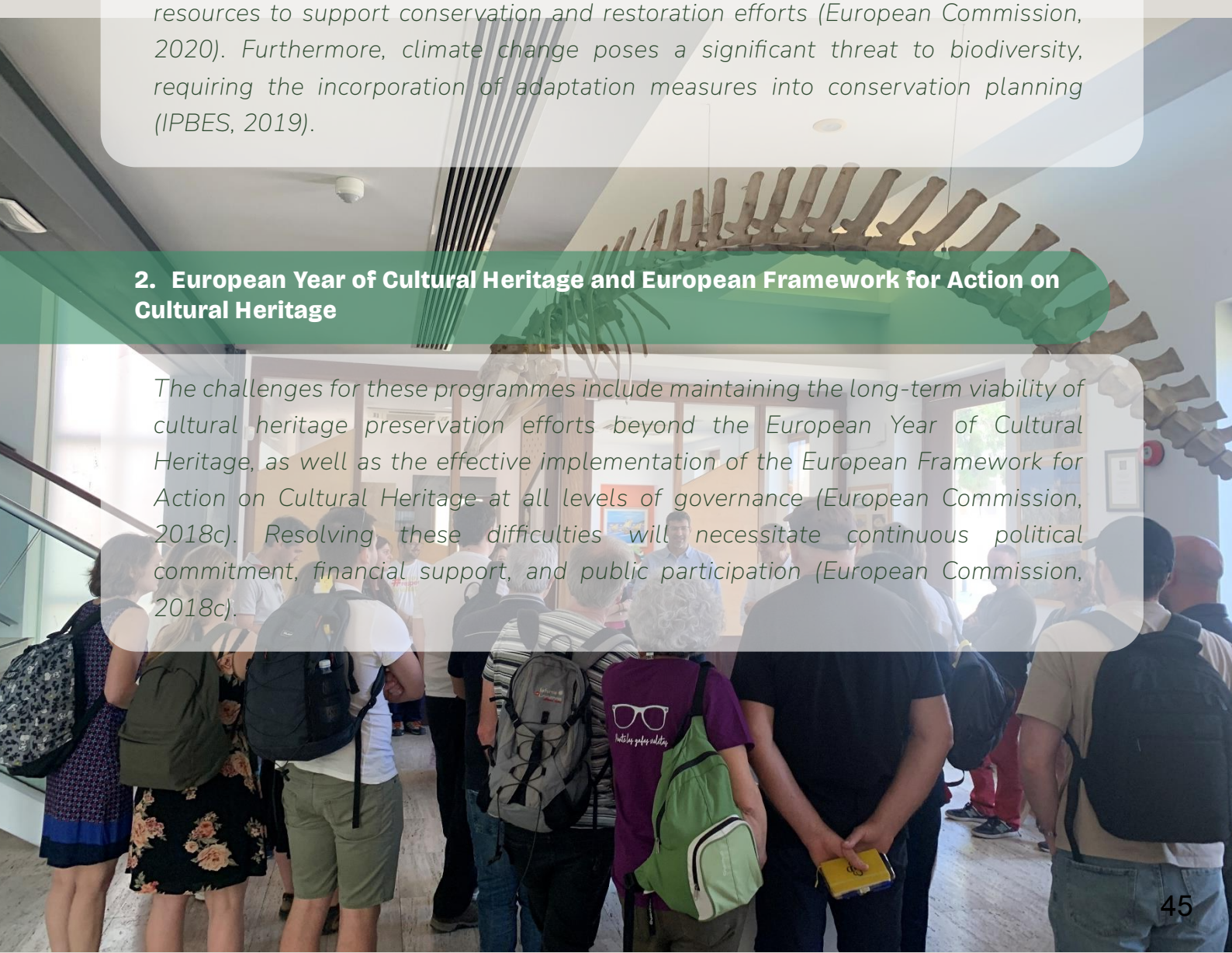
The European Heritage Label (EHL) is a programme that identifies and promotes cultural heritage sites that have played an important role in the development of Europe's shared history and values (European Commission, 2021b). By emphasising the significance of these sites, the EHL fosters a sense of belonging to a shared European identity and encourages cross-cultural dialogue (European Commission, 2021b).

Challenges

The European Union is confronted with a number of challenges and threats to the preservation and protection of natural capital and cultural heritage. These obstacles include habitat loss and fragmentation, climate change, invasive alien species, pollution, unsustainable land and water use, urbanisation, and a lack of public awareness and participation (European Environment Agency, 2020; European Commission, 2020). Addressing these challenges will necessitate collaborative efforts at all levels of government, including public and private stakeholders, as well as a strong policy framework and sufficient financial resources (European Commission, 2018a).

1. EU Biodiversity Strategy for 2030

The main challenges for the EU Biodiversity Strategy for 2030 are policy implementation and enforcement, as well as mobilising adequate financial resources to support conservation and restoration efforts (European Commission, 2020). Furthermore, climate change poses a significant threat to biodiversity, requiring the incorporation of adaptation measures into conservation planning (IPBES, 2019).



2. European Year of Cultural Heritage and European Framework for Action on Cultural Heritage

The challenges for these programmes include maintaining the long-term viability of cultural heritage preservation efforts beyond the European Year of Cultural Heritage, as well as the effective implementation of the European Framework for Action on Cultural Heritage at all levels of governance (European Commission, 2018c). Resolving these difficulties will necessitate continuous political commitment, financial support, and public participation (European Commission, 2018c).

1. Water Framework Directive and Marine Strategy Framework Directive

Pollution from agricultural and industrial sources, unsustainable water use, and physical changes to water bodies are the main obstacles to achieving the goals of these directives (European Environment Agency, 2018). For these challenges to be overcome, it is critical to strengthen enforcement, improve stakeholder engagement, and better integrate water management and sectoral policies (European Commission, n.d.).

2. European Year of Cultural Heritage and European Framework for Action on Cultural Heritage

The challenges for these programmes include maintaining the long-term viability of cultural heritage preservation efforts beyond the European Year of Cultural Heritage, as well as the effective implementation of the European Framework for Action on Cultural Heritage at all levels of governance (European Commission, 2018c). Resolving these difficulties will necessitate continuous political commitment, financial support, and public participation (European Commission, 2018c).

3. Creative Europe Programme

The Creative Europe Programme's key challenges are assuring the sustainability of financed initiatives, developing cross-border cooperation, and boosting the accessibility and visibility of cultural property (European Commission, 2021). Partnerships and collaboration across the cultural, educational, and digital sectors can aid in overcoming these obstacles (European Commission, 2021).

4. Europa Nostra and European Heritage Awards

The mobilisation of resources and the encouragement of collaboration among NGOs, public bodies, and private stakeholders are among Europa Nostra's challenges (Europa Nostra, 2021). The European Heritage Awards face the task of ensuring that initiatives that are recognised contribute to the long-term protection of cultural assets and inspire others to participate in similar efforts (European Commission, 2018b).

Local Assessment

Key Performance Indicators (KPIs)

Depending on the context and specific objectives, local assessments of cultural heritage and natural capital can be approached in a variety of ways. However, here are some KPI suggestions and a road map to help guide the assessment process:

1. Biodiversity Index

Assess the health of natural capital by measuring the diversity of species and ecosystems in a given area.

2. Ecosystem Services Value

Determine the monetary and non-monetary value of natural capital ecosystem services such as water purification, air quality, and pollination.

3. Land Use Change

Monitor as to how natural habitats are being transformed into other land uses, like agriculture, urban development, and resource extraction.

4. Green Space Accessibility

The proportion of the population that has access to natural areas (parks, forests, wetlands, etc.) within a certain radius is measured.

5. Cultural Site Preservation

Examine the state of cultural heritage sites, including old buildings, ancient ruins, and traditional landscapes.

6. Community Engagement

Determine the extent of community participation in conservation efforts for the region's natural resources and cultural heritage.

7. Sustainable Tourism Indicators

Monitor the impact of tourism on natural capital and cultural heritage, ensuring that it is environmentally, socially, and economically sustainable.

Establishing a clear roadmap with key performance indicators (KPIs) like the biodiversity index, ecosystem services value, land use change, green space accessibility, cultural site preservation, intangible cultural heritage, community engagement, and sustainable tourism indicators is crucial for successfully assessing the local cultural heritage and natural capital. In order to guarantee the long-term protection of cultural assets and motivate others to take part in comparable initiatives, partnerships and collaboration across the cultural, educational, and digital sectors can help the assessment process.

Roadmap for action

Short-term (1-2 years)

- *Establish baseline data for all key performance indicators by conducting exhaustive surveys and evaluations of the local natural capital and cultural heritage.*
- *Develop and implement a community outreach programme to increase awareness of the significance of preserving natural capital and cultural heritage and to encourage local participation in conservation efforts.*
- *Initiate collaboration with relevant stakeholders, including local government, businesses, and non-governmental organisations, in order to address land use change and promote sustainable development practises.*

Medium-term (3-5 years)

- *Establish and strengthen protected areas for the conservation of biodiversity, and implement restoration projects to enhance the value of ecosystem services.*
- *Develop and enforce regulations to prevent the degradation and destruction of cultural heritage sites.*
- *Promote sustainable tourism practises and develop management guidelines for the impacts of tourism on natural capital and cultural heritage.*
- *Monitor the progress of KPIs, adjusting strategies and actions as needed to achieve the desired outcomes.*

Long-term (6-10 years)

- *Continue to encourage community engagement and participation in the preservation of natural capital and cultural heritage, fostering a sense of ownership among the local populace.*
- *Collaborate with regional and international partners to share best practises and knowledge and advocate for the recognition of natural capital and cultural heritage in national and international policy frameworks.*
- *Examine and revise the road map on a regular basis in light of shifting conditions and emerging trends, ensuring that the plan remains effective and relevant in protecting and enhancing the local natural capital and cultural heritage.*

Suggested actions

This section of the module proposes a series of actions that local communities can take to achieve their objectives of protecting and enhancing these valuable assets.

Conservation Programs

Local communities should prioritise the creation and implementation of comprehensive conservation programmes aimed at the restoration and preservation of natural habitats, especially those with high biodiversity value and ecosystem services. Collaboration with local stakeholders, including governments, NGOs, and businesses, is necessary for the long-term success of these programmes.

Local Cultural Heritage Committee

The formation of a cultural heritage committee can aid in the local identification, documentation, preservation, and promotion of tangible and intangible cultural heritage. This committee can serve as a hub for coordinating efforts and resources related to the preservation of cultural heritage.

Sustainable Land Management

Local communities should promote the adoption of sustainable agricultural, forestry, and urban planning practises in order to reduce land use change and habitat loss. This strategy will contribute to the preservation of natural capital and the support of ecosystem services.

Green Infrastructure

Investing in the expansion and maintenance of green infrastructure, such as parks, urban forests, and green corridors, can increase access to natural spaces and improve the health of local populations. In addition to providing essential habitats for biodiversity, these areas also contribute to ecosystem services.

Community-Based Conservation Initiatives

Supporting and empowering local communities to actively participate in the conservation and management of natural capital and cultural heritage can foster a sense of responsibility and ownership. Integrating traditional knowledge and practises into the decision-making process can increase the efficacy of conservation efforts.

Environmental Education and Awareness

Increasing awareness of the value of natural capital and cultural heritage can be facilitated by integrating environmental education programmes aimed at different age groups and stakeholders. By highlighting the role of individuals and communities in conservation efforts, active participation and support can be increased.

Sustainable Tourism Development

Local communities can reap economic benefits from promoting eco-friendly tourism practises that minimise negative impacts on natural capital and cultural heritage. Developing and enforcing sustainable tourism guidelines in sensitive areas can help achieve a balance between visitor enjoyment and resource conservation.

Legal Frameworks and Enforcement

It is important to strengthen local laws and policies that protect natural capital and cultural heritage. Effective enforcement mechanisms and penalties for non-compliance can deter harmful activities and ensure the long-term preservation of these resources.

Monitoring and Evaluation Systems

Establishing systems to regularly monitor and evaluate the status of natural capital and cultural heritage, as well as the efficacy of implemented actions, can inform decision-making and allow for the necessary adaptation of strategies.

Financial Resources and Incentives

It is essential to secure funding and resources to support conservation and management efforts. Creating incentive programmes for individuals, communities, and businesses can encourage the implementation of sustainable practises and conservation measures.

Implementing these suggested actions can enable local communities to achieve their goals of protecting and enhancing natural capital and cultural heritage more effectively. These initiatives can contribute to the long-term preservation and appreciation of our natural and cultural heritage by promoting a holistic approach that involves multiple stakeholders and encompasses numerous facets.

References

Articles

Costanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., ... & van den Belt, M. (1997). The value of the world's ecosystem services and natural capital. Nature, 387(6630), 253-260. https://doi.org/10.1038/387253a0

Websites:

Europa Nostra. (2021). About Us. Retrieved from https://www.europanostra.org/about-us/
European Commission (2018a). European Year of Cultural Heritage 2018. Retrieved from https://ec.europa.eu/culture/eych2018_en
European Commission (2018a). European Year of Cultural Heritage 2018. Retrieved from https://ec.europa.eu/culture/eych2018_en
European Commission (2018c). A New European Agenda for Culture. Retrieved from https://ec.europa.eu/culture/sites/culture/files/library/documents/10307-european-agenda-culture_en.pdf
European Commission (2018c). A New European Agenda for Culture. Retrieved from https://ec.europa.eu/culture/sites/culture/files/library/documents/10307-european-agenda-culture_en.pdf
European Commission (n.d.). Water and marine. Retrieved from https://ec.europa.eu/environment/water/index_en.htm
European Commission (n.d.). Water and marine. Retrieved from https://ec.europa.eu/environment/water/index_en.htm
European Commission. (2018a). European Year of Cultural Heritage 2018. Retrieved from https://europa.eu/cultural-heritage/european-year-cultural-heritage_en
European Commission. (2019). European Year of Cultural Heritage 2018: Final report. Retrieved from https://op.europa.eu/en/publication-detail/-/publication/15f5eb60-5ae1-11e9-962e-01aa75ed71a1/language-en/format-PDF/source-113590270
European Commission. (2021a). Creative Europe Programme. Retrieved from https://ec.europa.
European Commission. (2021b). European Heritage Label. Retrieved from https://ec.europa.eu/programmes/creative-europe/actions/heritage-label_en
European Court of Auditors (2017). More efforts needed to implement the Natura 2000 Network to its full potential. Retrieved from https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=410
European Court of Auditors (2017). More efforts needed to implement the Natura 2000 Network to its full potential. Retrieved from https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=410
Millennium Ecosystem Assessment. (2005). Ecosystems and human well-being: Synthesis. Island Press. Retrieved from https://www.millenniumassessment.org/documents/document.356.aspx.pdf eu/programmes/creative-europe_en
UNESCO. (2003). Convention for the Safeguarding of the Intangible Cultural Heritage. United Nations Educational, Scientific and Cultural Organization. Retrieved from https://ich.unesco.org/en/convention

United Nations. (n.d.). Sustainable Development Goals. United Nations. Retrieved from https://www.un.org/sustainabledevelopment/sustainable-development-goals/
World Bank. (2021). Natural Capital. Retrieved from https://www.worldbank.org/en/topic/environment/brief/natural-capital
World Economic Forum. (2020). The Future of Nature and Business. Retrieved from https://www3.weforum.org/docs/WEF_The_Future_Of_Nature_And_Business_2020.pdf
World Heritage Centre. (n.d.). Cultural heritage. Retrieved from https://whc.unesco.org/en/culturalheritage/

Further reading

European Commission: Directorate-General for Education, Youth, Sport and Culture, Kruger, T., Mohamedaly, A., Muller, V., Rodriguez, A. et al., Greening the Creative Europe Programme – Final report, Kruger, T.(editor), Mohamedaly, A.(editor), Muller, V.(editor), Rodriguez, A.(editor), Feifs, T.(editor) and Buiskool, B.(editor), Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2766/625636
European Commission: Directorate-General for Education, Youth, Sport and Culture, Get inspired! – Culture – A driver for health and wellbeing in the EU, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2766/09124
European Commission: Directorate-General for Education, Youth, Sport and Culture, Strengthening cultural heritage resilience for climate change – Where the European Green Deal meets cultural heritage, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2766/44688
European Investment Bank: What is Natural Capital, 2024. Retrieved from https://www.eib.org/en/stories/nature-environment-pollution
Potts, A (Lead Author). 2021. Executive Summary. In: European Cultural Heritage Green Paper Executive Summary. Europa Nostra, The Hague & Brussels. Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fondazionescuolapatrimonio.it/wp-content/uploads/2021/03/European-Cultural-Heritage-Green-Paper_Executive-Summary.pdf
Council of Europe (2005) Framework convention on the value of cultural heritage for society. Faro, 27.10.2005. https://www.coe.int/en/web/culture-and-heritage/faro-convention .
ICCROM(2015). People-centered approaches to the conservation of cultural heritage. Living Heritage. https://www.iccrom.org/publication/people-centred-approaches-conservation-cultural-heritage-living-heritage
GKA (2007) Local Interpretation Plans: a Tool Kit to Help Communities Explore Local Heritage . Wales/Herian.
Kretzmann, J.P., & McKnight, J.L. (1993) Building Communities from the Inside Out: a Path Toward Finding and Mobilizing a Community's Assets. Skokie, IL: ACTA Publications.

Module 4

Biodiversity conservation and ecosystem services

Cláudia Vanessa Silva

Key-words

Biodiversity
Nature conservation
Policy makings
Ecosystem services

EU Green Deal

Climate, Environment and oceansl, Biodiversitv Strateav for 2030

Targeted SDG's

#3, #7, #11, #13, #14, #15, #17

Summary

1 **Biodiversity Conservation**

In this unit we will understand the concept of biodiversity, its layers, and why it is crucial for maintaining ecosystem balance and human well-being. Learners will explore the causes of biodiversity loss, European conservation policies and guidelines, and practical approaches to assess and manage biodiversity in their territory, with examples of suggested actions.

2 **Ecosystem Services**

In this section we will grasp the concept and types of ecosystem services, understanding their vital role in supporting life and human activities. The unit shows how human actions impact these services, explore European initiatives to promote them, and acknowledge practical tools for mapping and assessing ecosystem services, and how to leverage these services for economic opportunities.

Learning outcomes

- *Understanding what is biodiversity, why it matters, layers of bidoviersity, bidoversity loss, specific policies and Lousada's territory.*

Understanding the concept of ecosystem services, its impacts and trends and Lousada's territory.

Module content

Introduction

Biodiversity is essential for the processes that support all life on Earth, including humans.

While some correlations are evident (Pollinators such as birds, bees and other insects are estimated to be responsible for a third of the world's crop production, and without them we would not have apples, cherries, blueberries, almonds and many other foods we eat. Trees, bushes and wetlands and wild grasslands naturally slow down water and help soil to absorb rainfall, and when they are removed it can increase flooding. Trees and other plants and algae clean the air we breathe and help us tackle the global challenge of climate change by absorbing carbon dioxide. Coral reefs and mangrove forests act as natural defenses protecting coastlines from waves and storms.), some may be less obvious (Invertebrates help to maintain the health of the soil crops grow in. Soil is teeming with microbes that are vital for liberating nutrients that plants need to grow, which are then also passed to us when we eat them. Many of our medicines, along with other complex chemicals that we use in our daily lives such as latex and rubber, originate from plants.), less direct (Tropical tortoises and spider monkeys seemingly have little to do with maintaining a stable climate. But the dense, hardwood trees that are most effective in removing carbon dioxide from the atmosphere rely on their seeds being dispersed by these large fruit-eaters) or even unknown, yet to be discovered - if we preserve our natural values long enough for them to be thoroughly studied.

As scientists examine each ecosystem, they uncover numerous of these interactions, all perfected over millions of years of evolution. When these systems remain unaltered, they form a delicately balanced environment, contributing to a sustainable and thriving planet that provides us with all the resources we need for food and materials, supports economical activities, and even regulates our mental and physical health.

While the topic of ecosystem services will be developed in the next chapter, you can find here an example of how taking one unique species out of an ecosystem can completely change it.

State of the art

Biodiversity conservation

What is biodiversity

All living organisms are classified and organized based on their shared characteristics and evolutionary relationships in a hierarchical system called **taxonomy**.

The broadest category, the **domain**, *is divided into three groups:*

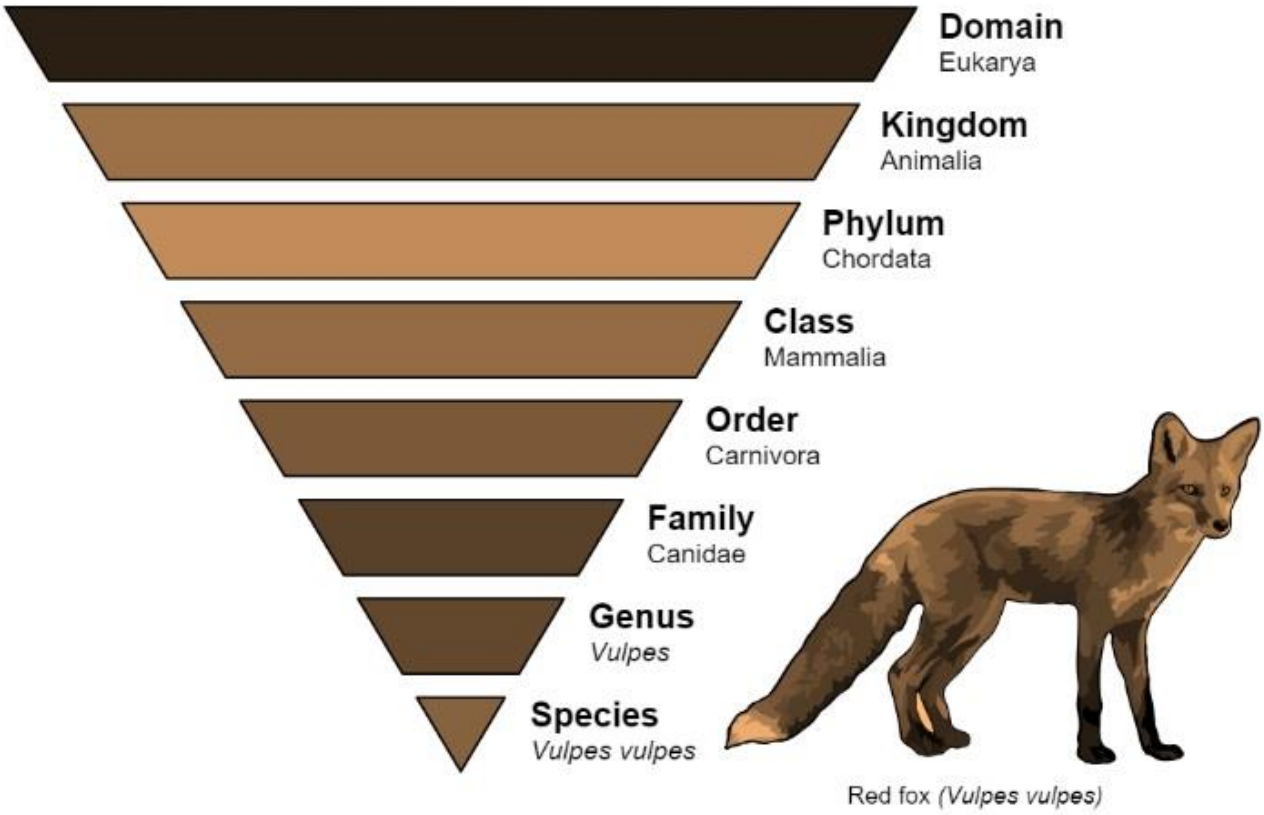
- *Bacteria: Single-celled prokaryotes without a nucleus, with cell walls made of peptidoglycan (eg.Escherichia coli, Streptococcus, Cyanobacteria) .*
- *Archaea: Single-celled prokaryotes without a nucleus, often found in extreme environments, with unique biochemical properties (eg. Methanogens, Halophiles, Thermophiles).*
- *Eukarya: Organisms with complex cells containing a nucleus and membrane-bound organelles, including both single-celled and multicellular organisms.*

The domain Eukarya, or Eukaryota, is divided into four **kingdoms**:

- *Protista: A diverse group mostly consisting of single-celled organisms, but also includes some simple multicellular forms (eg. brown algae, red algae and green algae).*

- *Fungi: Organisms that absorb nutrients from organic materials. They have cell walls made of chitin and reproduce via spores (eg. yeasts, molds, mushrooms).*
- *Plantae: Multicellular organisms that perform photosynthesis using chlorophyll. They have cell walls made of cellulose (eg. mosses, ferns, flowering plants).*

- *Animalia: Multicellular organisms that consume organic material for energy. They lack cell walls and are typically motile at some life stage (eg. insects, birds, mammals).*



Taxonomy pyramid of a Red Fox

Within each kingdom, organisms are grouped into phyla , then into classes, orders, families, genera, and finally into **species**, *which is the most specific level, representing individual organisms that can interbreed and produce fertile offspring.*

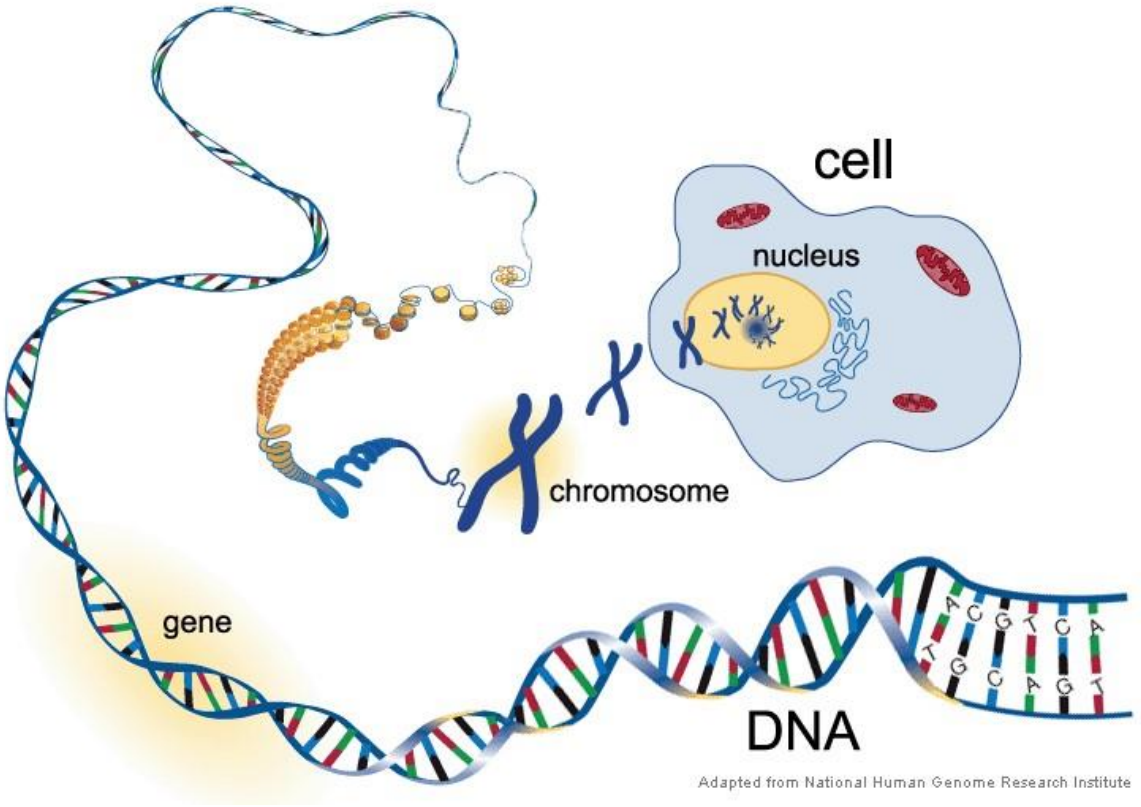
According to the Convention on Biological Diversity, ***biodiversity means the variability within species, between species, and of ecosystems.*** *It can be assessed at the genetic level, phenotypically (differences in characteristics between organisms) and functionally (the functions each organism performs).*

Layers of biodiversity

Genetic Diversity

Cells are the basic building blocks of all living things. There are hundreds of different kinds of cells in the body, each specially adapted to do different jobs. Inside almost every cell in our body is a molecule called DNA, and it contains the genetic code that is unique to every individual. The fundamental unit of heredity information it's called a gene, a short section of DNA, and each one carries instructions that determine our features, such as eye color, hair color and height.

Genetic diversity appears within a species through mutations, gene flow (the transfer of genes between populations), sexual reproduction (which combines genes from two parents), and genetic recombination during cell division (which shuffles genes to create new combinations).



Organization of DNA

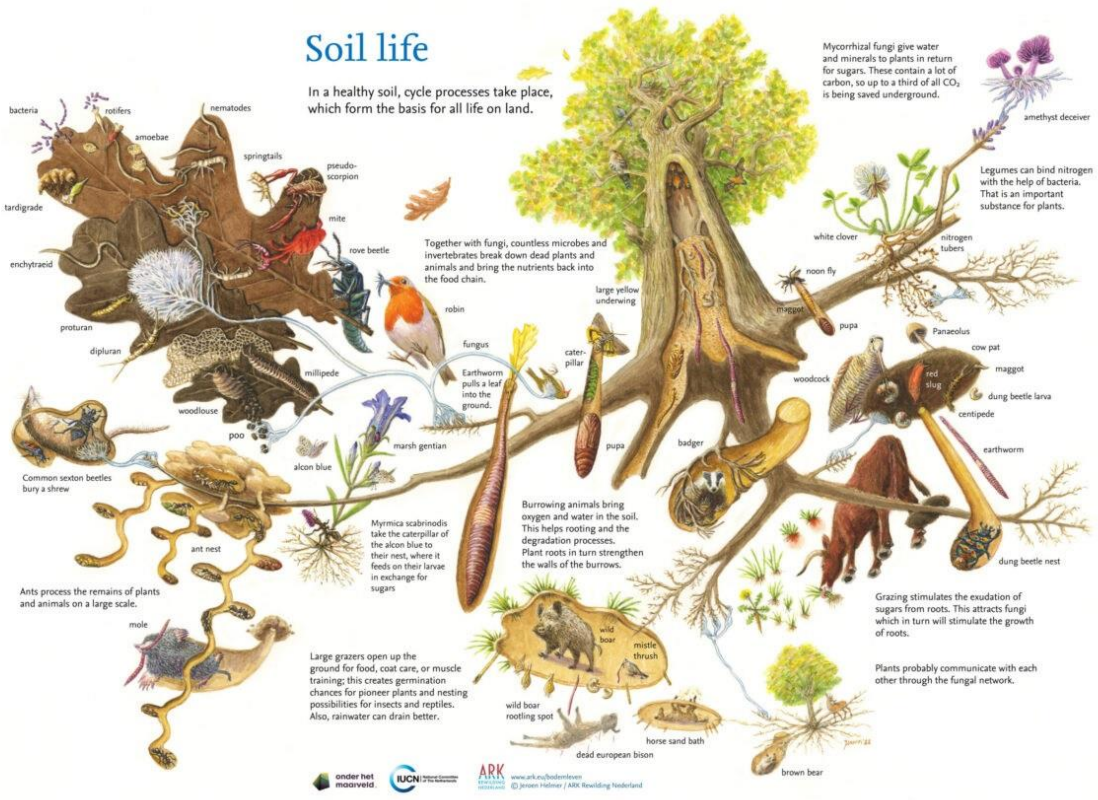
This diversity occurs both within and between populations of organisms and is crucial for adaptation and survival, since when facing environmental changes and new diseases, the individuals that present favorable traits will be the ones surviving and passing on their genes, a process called natural selection.

A similar process occurs while breeding domestic dogs, where different breeds have been developed to emphasize traits like size, temperament, or coat type, or when farmers every season only propagate the seeds of the most prolific individuals, ending up with the plants that guarantee the highest yielding. This artificial selection of genes is called selective breeding, and presents some challenges: While reducing the genetic pool within the population addressed, not only the desired traits are selected, but some other characteristics may be funneled by accident. This is why Labrador Retrievers are prone to hip dysplasia, and Border Collies have a much higher incidence of epilepsy. Moreover, it is common that in the agricultural field all crops are genetically similar, which reduces their resistance to pests and diseases, increasing dependence on pesticides. These crops are also selected for their size and appearance, often resulting in lower nutritional values compared to their wild ancestors.

Species Diversity

The variety and abundance of different species within a particular region or ecosystem encompasses both ***species richness****, a simple count of number of different species present, and species* ***evenness****, relative abundance, measuring how equal the populations of each species are.*

Ecosystems with more species are typically more resilient and productive, while high species evenness implies a ***balanced ecosystem*** *where no single species dominates and resources are more efficiently used since different species exploit* ***different niches****.*



Processes around soil life

The ecological interactions between species can be summarized below.

Interaction	*Description*	*Sp 1*	*Sp 2*	*Example*
Competition *Occurs when two or more species vie for the same resource, such as food, water, or territory.*	*Can limit population growth and influence the distribution and abundance of species.*	*-*	*-*	*Trees in a forest competing for sunlight and nutrients.*
Predation *Involves one species (predator) hunting and consuming another species (prey).*	*Helps control prey populations and can drive evolutionary adaptations.*	*+*	*-*	*Snakes hunting rodents.*
Parasitism *One species (parasite) benefits at the expense of another species (host), often without killing it.*	*Can affect host population health and dynamics.*	*+*	*-*	*Ticks feeding on mammals.*
Mutualism *Both species benefit from the interaction.*	*Enhances survival and reproduction of both species involved.*	*+*	*+*	*Bees pollinating flowers while obtaining nectar.*
Commensalism *One species benefits while the other is neither helped nor harmed.*	*Can influence the distribution and abundance of the benefitting species.*	*+*	*0*	*Barnacles attaching to a whale.*
Amensalism *One species is harmed while the other is unaffected.*	*Can impact the population of the harmed species.*	*0*	*-*	*Cows stepping on bird's nests in the ground.*

Understanding these relationships allows us to determine a species's **functional role** *- the specific contribution an organism makes to the ecosystem's health and functioning, helping prioritizing conservation efforts and predicting possible chain-effects of changing environments.*

This roles can be based on the species trophic level:

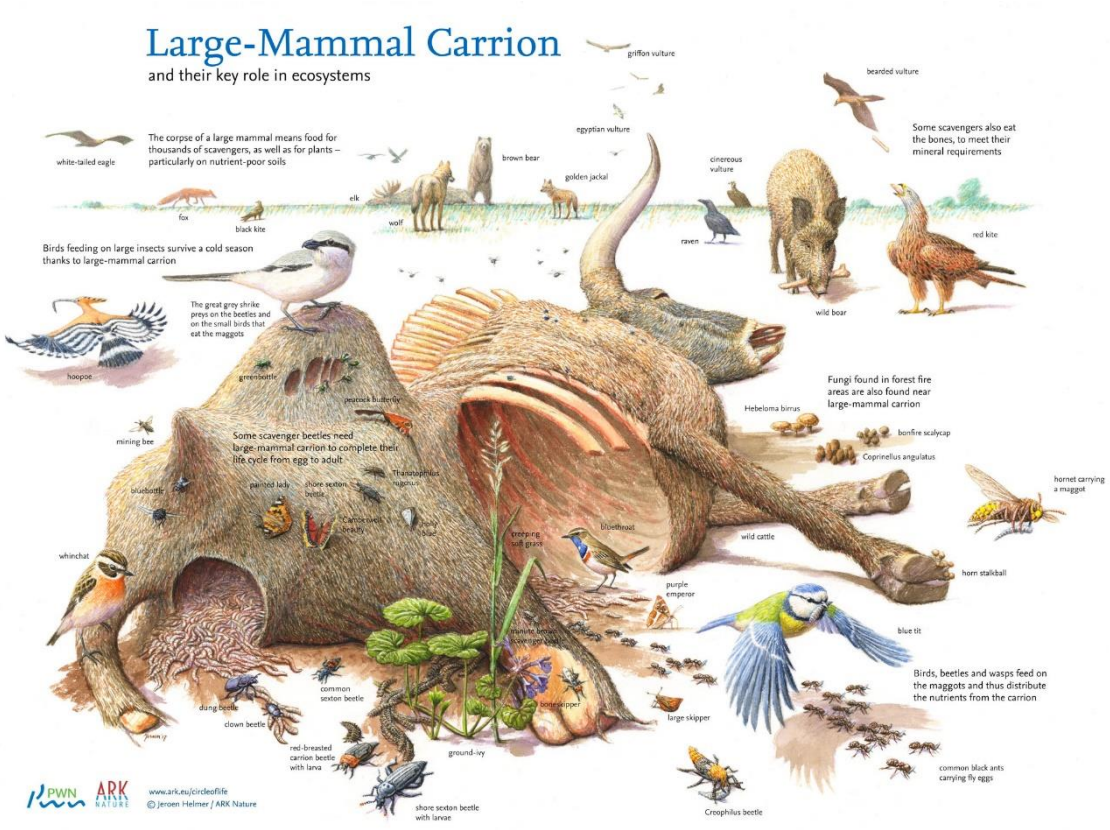
- *Decomposers, organisms that break down dead organic matter and recycle nutrients back into the ecosystem. They complete the nutrient cycle, returning essential elements like nitrogen and phosphorus to primary producers. Examples: Fungi (e.g., mushrooms), bacteria, earthworms, and scavenging insects like beetles.*

- *Primary Producers, creating energy from sunlight (photosynthesis) or chemicals (chemosynthesis). They form the base of the food chain, converting energy into organic matter that sustains all other trophic levels. Examples: Plants (e.g., grasses, trees), algae (e.g., phytoplankton in aquatic ecosystems), and certain bacteria (e.g., cyanobacteria).*

- *Primary Consumers, herbivores that consume primary producers for energy. They transfer energy from plants to higher trophic levels and regulate plant populations. Examples: Deer, rabbits, grasshoppers, and zooplankton (which feed on phytoplankton).*

- *Secondary Consumers, carnivores that eat primary consumers for energy, regulating herbivore populations and transferring energy up the food chain. Examples: Wolves, lions and snakes.*

- *Tertiary and Quaternary Consumers, top predators that consume secondary and tertiary consumers, respectively. They control populations of other predators and maintain ecosystem balance, having significant impacts on ecosystem structure. Examples: Eagles, sharks, large predatory birds, and apex predators like polar bears and killer whales.*



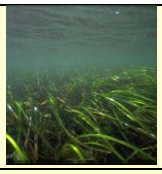
Cycle of life: A decaying corpse of a large mammal feeds numerous other species.

Or based on the **interactions** *of the organism with other species and the environment, like for example:*

- *Pollinators, assisting in the reproduction of flowering plants by transferring pollen. Example: Bees, butterflies, bats.*

- *Foundation Species, creating and shaping habitats for other species. Example:Coral in coral reefs, beavers with their dams.*

Some species have a disproportionately large impact on their ecosystem relative to their abundance, playing a critical role in maintaining the structure, diversity, and health of their environment and earning the title of **keystone species**. *Removing these organisms can lead to significant changes in the ecosystem and often results in the loss of other species. Some examples of Europe's keystone species can be found below.*

					
Oak Trees *Quercus spp.*	***Gray Wolf*** *Canis lupus*	***Seagrass*** *Zostera spp.*	***European Beaver*** *Castor fiber*	***Heather*** *Calluna vulgaris*	***Red Fox*** *Vulpes vulpes*
Support a wide variety of species, including insects, birds, and mammals. Oaks are crucial for forest structure and biodiversity.	*Regulates populations of large herbivores such as deer and wild boar, promoting forest regeneration and supporting a balanced ecosystem.*	*Forms underwater meadows crucial for marine biodiversity, providing habitat and nursery grounds for many marine species.*	*Creates wetlands by building dams, which provide habitat for numerous species, improve water quality, and help regulate water flow.*	*Dominates heathland ecosystems and supports species like the rare heath butterfly and other invertebrates, birds, and reptiles.*	*Controls populations of smaller mammals and rodents, which helps maintain a balanced ecosystem and prevents overgrazing of vegetation.*

The origin of a species is intrinsically related to their impact on ecosystems.

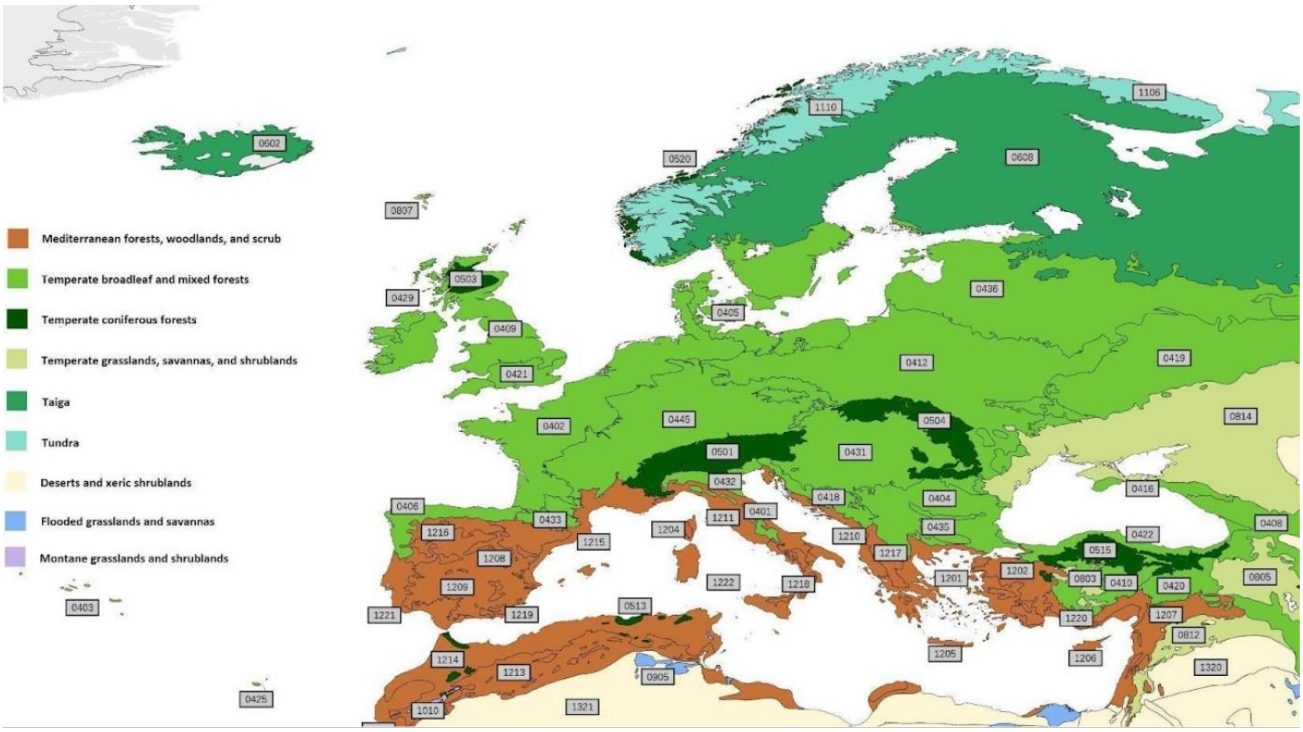
*Native species are those that have naturally occurred in a region for a very long time, coevolving with other local species and establishing balanced relationships. **They support other species and are also naturally controlled, contributing to a stable ecosystem**. Exotic species are introduced by humans to new areas where they do not naturally thrive, often maintaining their distribution restricted to the locations where they were placed and requiring significant human support such as farming, fertilizers, and pesticides to sustain them. Because they haven't developed relationships with native species through coevolution, they typically do not benefit them, but they are not necessarily harmful either. Did you know that despite being a staple of European cuisine, potatoes are native to South America and were only introduced to our continent in the 16th century? Invasive species are a subset of exotics which reproduce autonomously and abundantly, spreading in high density beyond the locations where they were initially introduced. This species outcompetes natives and alter habitats, **causing environmental and socioeconomic damages**. It's crucial to motorize the spreading of this species and act as soon as possible, prioritizing early infections, creating buffer zones and working from the outside in. Note that a large intervention without follow-up is usually ineffective, as invasive species can quickly return. It's better to focus on smaller areas intensively, ensuring they're free of invasives and the system is restored back to balance with natives before moving on, in order to save time and resources on the long run,*

A recent study has estimated the economic cost of control of the Asian hornet (Vespa velutina nigrithorax) to be around € 11.9 million yearly in France, while the damage-related cost could be up to three times higher than that.

Ecosystem Diversity

*An **ecosystem** is a community of interacting organisms and their physical environment, functioning as a unit, in a particular area. It encompasses different habitats, **biotic factors** (all living organisms such as plants, animals, and others), as well as **abiotic factors**, or nonliving parts (such as soil, water, air, and sunlight or humidity).*

*On a larger scale, we have **biomes**, large geographical areas with distinct climate, plants, and animals adapted to its different ecosystems. And on a smaller scale, we have **habitats**, specific environments for each species or population to live in.*



Some of the main European biomes, as described below. The gray codes represent the Terrestrial Ecoregions of the World, according to the World Wide Fund for Nature (WWF), which you can consult for further detail.

- **Mediterranean Forests, Woodlands, and Scrub:** *Characterized by hot, dry summers and mild, wet winters; vegetation includes drought-resistant shrubs, olive trees, and cork oaks.*

- **Temperate Broadleaf and Mixed Forests:** *Experience four distinct seasons with cold winters and warm summers; home to a variety of broadleaf trees like oak, beech, and maple, often mixed with coniferous trees.*

- **Temperate Coniferous Forests:** *Cool, moist climate with well-distributed rainfall; dominated by coniferous trees like pines, spruces, and firs.*

- **Temperate Grasslands, Savannas, and Shrublands:** *Characterized by vast, open landscapes with grasses, few trees, and a moderate climate.*

- **Taiga (Boreal Forest):** *Long, cold winters and short, mild summers; dominated by coniferous trees like pines, spruces, and firs.*

- **Tundra:** *Very cold temperatures, low biodiversity, and a short growing season; vegetation includes mosses, lichens, and dwarf shrubs.*

- **Deserts and Xeric Shrublands:** *Arid conditions with sparse rainfall; vegetation includes drought-resistant plants and shrubs.*

- **Flooded Grasslands and Savannas**: *Characterized by waterlogged soils and a mix of grasses and aquatic plants.*

- **Montane Grasslands and Shrublands**: *Montane forests at lower elevations and alpine meadows and shrubs at higher elevations.*

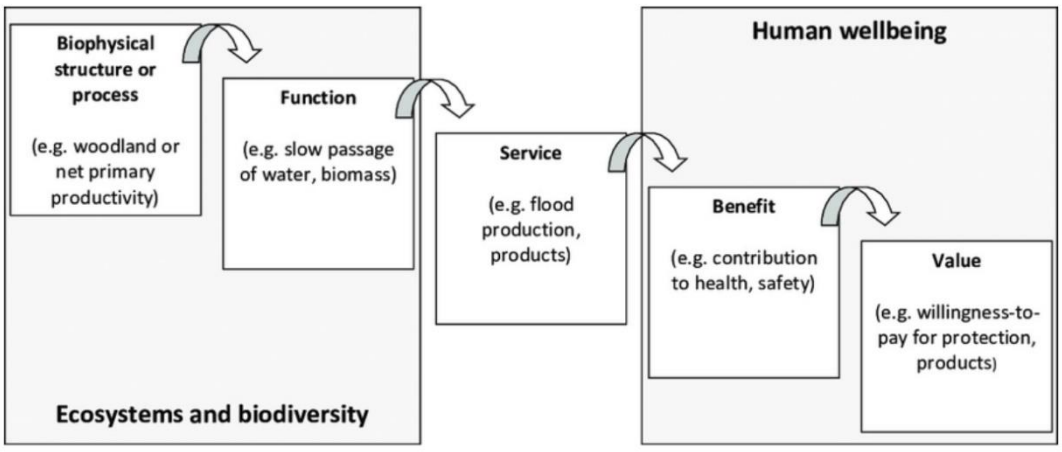
Influenced by the availability of resources, primary productivity, and habitat complexity, tropical regions with higher temperatures and humidity present maximum levels of biodiversity. However, cold and/or dry regions, although presenting a lower number of species present, are home to very special beings adapted to extreme environments and hold key roles in regulating the climate worldwide.

Ecosystem services

The food we eat, the air we breathe, and the water we drink come from natural processes. An ecosystem is the collection of living organisms, the physical environment that surrounds them, and all their biological, chemical, and physical interactions.

Ecosystem services encompass all the benefits humanity derives from natural processes and may include both material goods and intangible services.

The concept emerged from the need to quantify, evaluate, and assign a value to these benefits. Society depends on the goods and services produced by the ecosystems of our planet, which we take for granted and exploit excessively, jeopardizing their balance and our own



The ecosystem services 'cascade', adapted from Haines-Young and Potschin (2010)

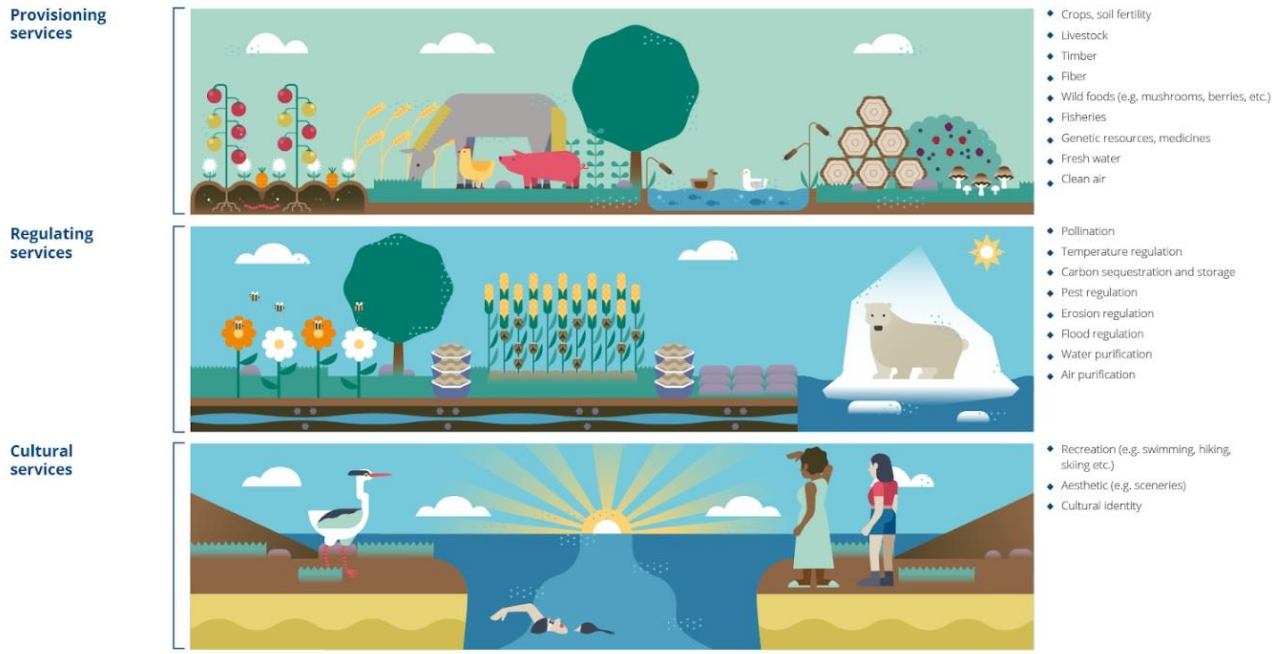
Types of ecosystem services

The Common International Classification of Ecosystem Services (CICES) an the European Nature Information System (EUNIS), the main european ecosystem classification, use the following three broadly agreed categories of ecosystem services:

- **Provisioning services** *are those ecosystem services representing the contributions to benefits that are extracted or harvested from ecosystems; examples are mushroom or fish harvested in the wild and the crops and grazed areas that deliver us bread, meat and other foodstuffs;*

- **Regulating and maintenance services** *are those ecosystem services resulting from the ability of ecosystems to regulate biological processes and to influence climate, hydrological and biochemical cycles, and thereby maintain environmental conditions beneficial to individuals and society. Climate regulation and water flow regulation are important examples of this type;*

- **Cultural services** *are the experiential and intangible services related to ecosystems whose existence and functioning contributes to a range of cultural benefits, such as improved health, recreation or cultural rituals.*



"What are ecosystem services? ", European Environment Agency

Importance of a clear definition

We only care about what we understand,so it is essential to identify and measure ecosystem services in a ***standardized way*** *in order to* ***improve communication*** *among scientists, policymakers, and the public. This leads to more effective studies and quantifiable information for* ***decision-making*** *in land use planning, resource management, and economic development, ensuring ecosystems are properly considered.*

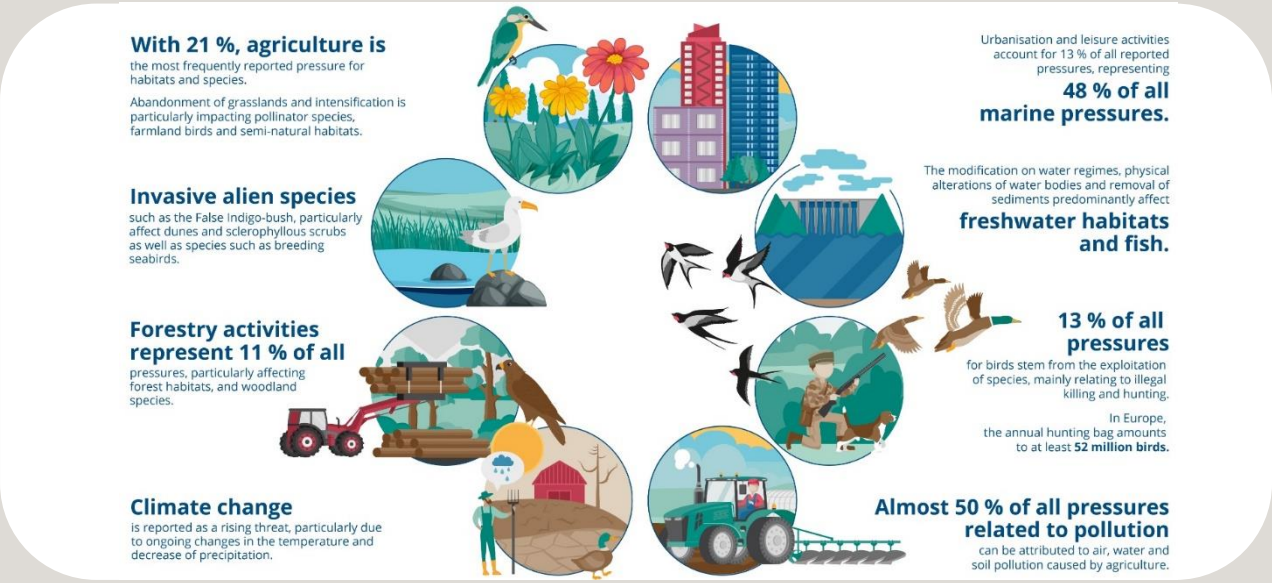
Challenges

Challenges to biodiversity conservation

Biodiversity loss

The pressures on Europe's biodiversity may vary depending on the habitat, region or species. The latest EEA report on the 'State of nature in the EU' shows that many ***agricultural activities****, intensifying land management practices, and the abandonment of extensive management are the most common overall pressures.*

Urbanization and leisure activities *are the second largest pressure and it particularly affects habitats such as dunes and coastal and rocky habitats.* ***Forestry activities*** *are the main source of pressure on arthropods, mammals and non-vascular plants. The pollution of air, water and soil from agriculture in particular, affects most habitats, especially in the European Union's Atlantic and continental regions.*



State of nature in the EU, EEA Report No 10/2020.

Biodiversity continues to decline at an alarming rate, with most ***protected species and habitats*** *confronting* ***poor conservation status****:*

- *Whilst 47% of 463 bird species in the EU are in good conservation status, 39% are in poor and bad conservation status.*
- *Three-fourths of habitats assessed have poor or bad conservation status.*
- *Half of the dunes, bogs, mires and fens have bad conservation status.*
- *Protected areas require further conservation measures: 215,000 km2 (approximately 5%) of EU-27 habitats must be improved.*

Much more effort is needed to reverse current trends and to ensure a resilient and healthy nature.

Impacts and trends on ecosystem services

Human activities, such as agriculture, urbanization, and industrialization, have both positive and negative impacts on ecosystem services. While farming provides food, it can degrade soil and water resources. Urbanization contributes to economic growth but often leads to habitat loss and reduced air quality.

The European Union has made significant strides in integrating ecosystem services into policy frameworks, particularly through the EU Biodiversity Strategy for 2030, which focuses on protecting ecosystems and enhancing their services, and the Common Agricultural Policy (CAP), evolving to incentivize more sustainable land-use practices. This reflect a broader shift towards sustainable practices such as organic farming, reforestation, and urban greening projects in order to restore or enhance the services offered by our natural capital:

- *Forests: Provisioning services like timber and non-timber products, regulate air quality, sequester carbon, and support biodiversity.*

- *Agricultural Landscapes: Provisioning services (food and fiber) but also cultural services through rural tourism. However, intensive agriculture can negatively impact regulating services, such as water and air quality.*

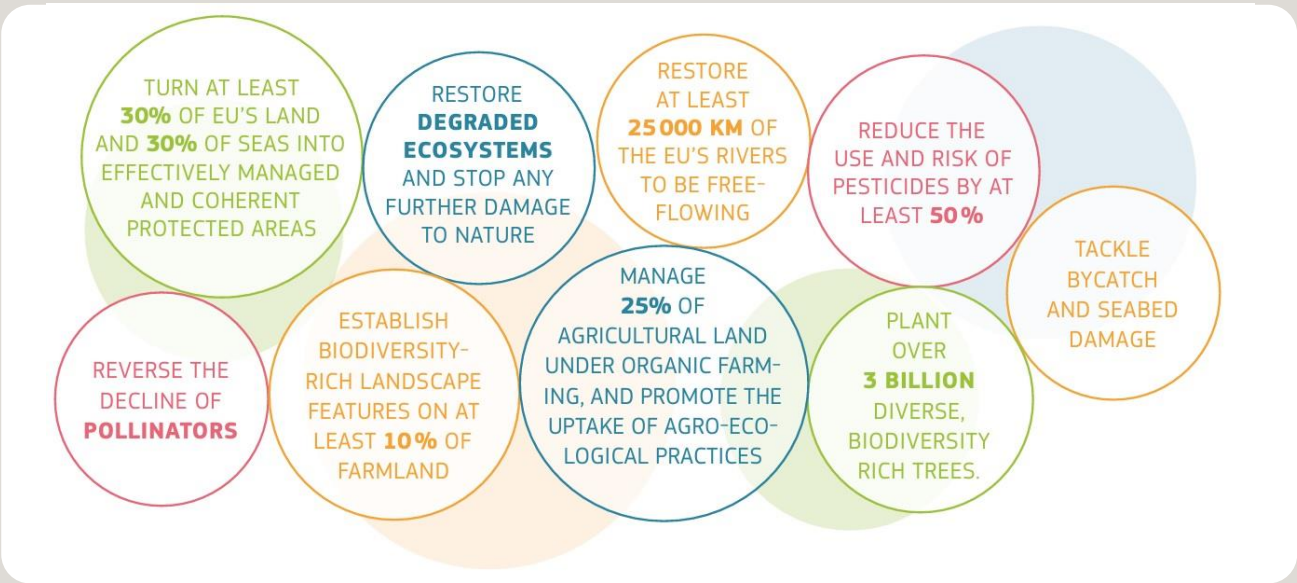
- *Wetlands: Essential for regulating water cycles, mitigating floods, and purifying water. They also provide habitat for many species and support biodiversity.*

- *Coastal and Marine Ecosystems: Provide food, support fisheries, and contribute to regulating services by acting as carbon sinks. They also play an important role in recreation and tourism.*

- *Urban Ecosystems: Though highly modified, green spaces in cities provide important cultural services (recreation and mental well-being) and have the potential to regulate services (air purification, urban cooling).*

Strategy to overcome challenges

The EU's biodiversity strategy for 2030 was launched on May 20, 2020 and it is a key component of the European Green Deal. The comprehensive long-term plan sets up ambitious goals to protect nature and reverse the degradation of ecosystems by 2030, as we can see below.



EU 2030 Biodiversity Strategy Goals, Factsheet May20/20

The framework to accomplish these goals are outlined by the following directives and guidelines:

- *Birds Directive (Directive 2009/147/EC): Aims to protect all wild bird species across the EU through the designation of Special Protection Areas (SPAs) and regulation of hunting and habitat destruction.*

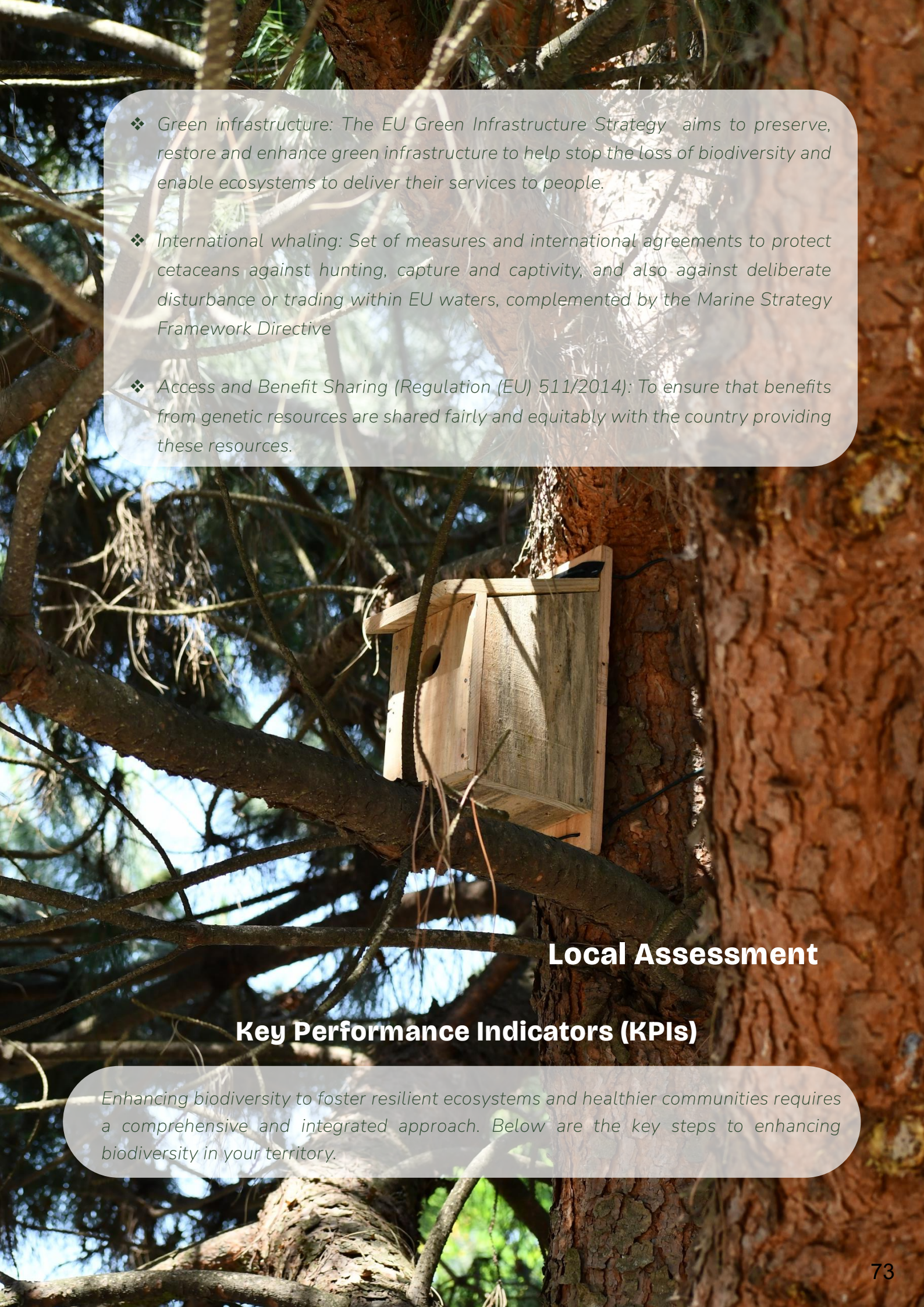
- *Habitats Directive (Directive 92/43/EEC): Focuses on the conservation of natural habitats and species by establishing a network of protected sites known as Natura 2000, ensuring the preservation of key habitats and species.*

- *Nature Restoration Law (Into force since 18/August/2024): This significant piece of legislation is the first continent-wide, comprehensive law of its kind. It sets legally binding targets for restoring ecosystems, such as forests, wetlands, grasslands, and marine areas.*
  EU countries are expected to submit National Restoration Plans to the Commission within two years of the Regulation coming into force (so by mid 2026), showing how they will deliver on the targets. They will also be required to monitor and report on their progress. The European Environment Agency will draw up regular technical reports on progress towards the targets. The Commission, in turn, will report to the European Parliament and to the Council on the implementation of the Nature Restoration Law.

- *Invasive Alien Species (Regulation (EU) 1143/2014): A set of measures to prevent, minimize, and manage the adverse impacts of invasive alien species (IAS) on biodiversity, ecosystems, human health, and the economy. The list of IAS of Union concern (Union List) includes 88 species (last update in 2022) subject to restrictions on keeping, importing, selling, breeding, growing and releasing into the environment.*

- *EU wildlife trade regulations: Aims to ensure that international trade in wild animals and plants does not threaten their survival while also tackling contraband. It complements CITES, an international agreement between governments that came into force in 1975 with the same goals.*

- *Urban Nature Platform: Supporting towns and cities in restoring nature and biodiversity with a useful guidance plan and toolkit.*



- *Green infrastructure: The EU Green Infrastructure Strategy aims to preserve, restore and enhance green infrastructure to help stop the loss of biodiversity and enable ecosystems to deliver their services to people.*
- *International whaling: Set of measures and international agreements to protect cetaceans against hunting, capture and captivity, and also against deliberate disturbance or trading within EU waters, complemented by the Marine Strategy Framework Directive*
- *Access and Benefit Sharing (Regulation (EU) 511/2014): To ensure that benefits from genetic resources are shared fairly and equitably with the country providing these resources.*

Local Assessment

Key Performance Indicators (KPIs)

Enhancing biodiversity to foster resilient ecosystems and healthier communities requires a comprehensive and integrated approach. Below are the key steps to enhancing biodiversity in your territory.

Initial Biodiversity Assessment

Species Inventory: Assess the biodiversity index of your territory by measuring species variety and abundance. Commonly studied **groups** include flora, birds, mammals, invertebrates, amphibians, reptiles, fish, fungi, and lichens. **Techniques** often involve direct sampling methods such as transect and quadrat surveys, visual encounter surveys, traps (e.g., camera, pitfall, or sweep nets) or acoustic monitoring and should last no less than **one year** to account for seasonal variations.

Habitat Mapping: Use geographic information systems (GIS) and field surveys to map existing natural habitats such as forests, wetlands, rivers, and urban green spaces.

Threat Identification: Identify current and potential threats to biodiversity, such as pollution, invasive species, habitat loss, and climate change impacts.

Stakeholder Engagement and Partnership

Engage with the **community** to gather data on historical species presence.

Collaborate with **academic** institutions to pool technical **expertise**, such as biologists, botanists, or ecologists, through internships or consultations.

NGOs and **businesses** can help provide material and human resources.

Work with **landowners** to co-manage private areas of interest.

Develop **environmental education** programs for all demographics, not just schools, to ensure the implemented changes are well-received in the **long term** and to motivate community participation through **volunteering** or **citizen science** initiatives like iNaturalist.

Monitor, evaluate and adapt

Establish baseline data for current biodiversity levels against which future changes can be measured.

Implement long-term **monitoring programs** to track the effectiveness of biodiversity initiatives. This data will also **help you get funding** for successful projects.

Use monitoring data to **adapt** and **refine strategies** over time, ensuring continuous improvement.

Analyze data and set Biodiversity Goals

Identify fragmented habitats and assess opportunities to create **ecological corridors** that connect them. Understand how climate and weather patterns affect the biodiversity in the area and consider **future climate risks**. Analyze your **threats** and the location of **endangered**, **threatened** or **keystone species** to help define **priority** on what degraded habitats to restore, which hotspots to preserve, where to increase green areas or mitigate pollution and invasive species.

These goals should be specific, measurable, and time-bound.

Habitat Restoration

Restore degraded areas by **planting** native tree and shrub species, considering **ecological succession** and the future impacts of **climate change**.

Reestablish natural **water flow**, restore **riparian galleries**, and create **ponds** to enhance water quality and habitats.

Control or remove **invasive species**.

Apply **natural engineering** techniques for **erosion** control and coastal protection.

Create structures to promote biodiversity by replicating natural **microhabitats**.

Land-Use

Designate **protected areas** and **buffer zones** around sensitive habitats.

Plan and establish **wildlife corridors** to connect fragmented ecosystems.

Incorporate green roofs, parks, and native ornamental plants in **urban areas**.

Limit road and infrastructure **development** in ecologically sensitive areas.

Promote **sustainable agriculture** and **forestry** practices

Policy Development and Regulation

Use national legislation tools, such as establishing **protected areas** or **nature reserves**, and develop **local regulations** to ensure the long-term protection of natural resources.

Offer **financial incentives** to landowners and developers who adopt sustainable practices.

Funding and resources

Allocate resources for biodiversity initiatives such land acquisition or restoration projects.

Apply for **national** and **international grants**, as well as **private awards**, once successful projects are established.

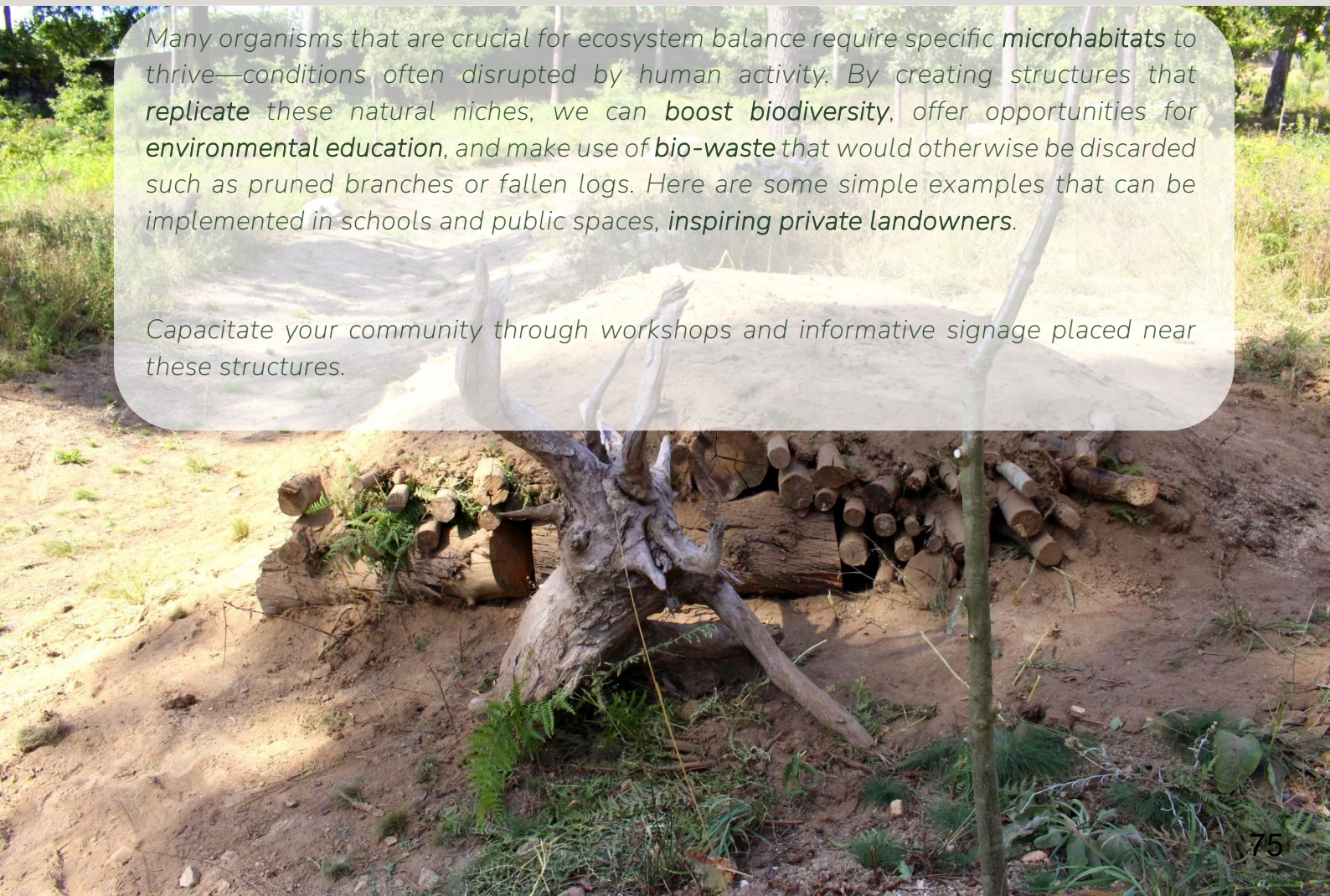
Work with local businesses to fund initiatives through **corporate social responsibility** programs.

Mapping and Assessing Ecosystem Services

*Target 2 Action 5 of the EU biodiversity strategy to 2020 stated that "Member States, with the assistance of the Commission, will map and assess the state of ecosystems and their services in their national territory by **2014**, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by **2020**. Initiatives such as the **EU's Mapping and Assessment of Ecosystems and their Services** (MAES) program were created to help do so through GIS and remote sensing technology.*

***Frameworks** such as the EU's Natural Capital Accounting and the Ecosystem Services Valuation Framework are commonly used to **measure** and **quantify** ecosystem services, helping policymakers evaluate their economic value and the potential trade-offs between land uses. Here you can find the Indicators of ecosystem condition and here the reference data for ecosystem mapping, with a Summary for policymakers on EU Ecosystem Assessment here .*

Suggested actions

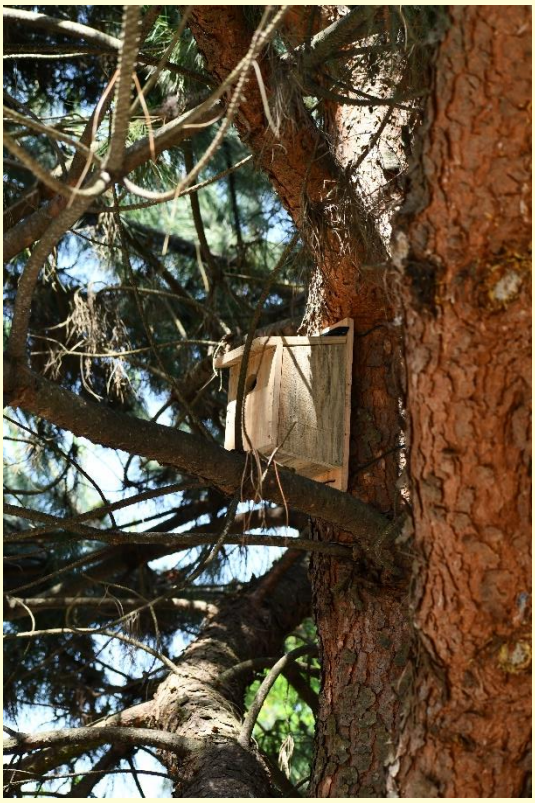


*Many organisms that are crucial for ecosystem balance require specific **microhabitats** to thrive—conditions often disrupted by human activity. By creating structures that **replicate** these natural niches, we can **boost biodiversity**, offer opportunities for **environmental education**, and make use of **bio-waste** that would otherwise be discarded such as pruned branches or fallen logs. Here are some simple examples that can be implemented in schools and public spaces, **inspiring private landowners**.*

Capacitate your community through workshops and informative signage placed near these structures.

Biodiversity loss

Nest box: *Made from untreated wood and different entries according to target species, can support breeding for birds or bats in areas lacking natural cavities.*



Deadwood fence: *Constructed by stacking pruned branches and logs, it provides habitat for insects, birds, small mammals and fungi, recycles bio waste, and supports decomposers that enrich the ecosystem while being a great opportunity to talk about different degradation speed between invasive and native species.*

Pond: *By installing a pond with a liner, stones, aquatic plants, and logs, you create a habitat for amphibians, aquatic insects, birds, and mammals, while also helping to channel rainwater into groundwater aquifers.*

Bug hotel: *Built from natural materials like hollow stems, wood blocks with holes, straw, and pine cones, a bug hotel attracts beneficial insects such as ladybugs and solitary bees. It offers shelter and breeding sites that enhance pest control and pollination. Opting for smaller structures can help reduce competition among inhabitants.*

Hibernaculum: *Uses logs, rocks, bricks, soil, and leaf litter to create insulated spaces where reptiles, amphibians, and overwintering insects can hibernate, increasing their survival rates during cold months.*

Sandarium: *Using different types of sand and fine gravel to provide nesting sites for ground-nesting solitary bees and other burrowing insects, thus supporting pollination biodiversity.*

Optimizing Ecosystem Services

Optimizing ecosystem services involves maintaining a balance between human needs and ecosystem health. This can be achieved by:

- **Restoring degraded ecosystems:** *Through reforestation, wetland restoration, or habitat connectivity projects, lost services can be regained.*
- **Promoting sustainable agriculture and forestry:** *Practices like organic farming, agroforestry, and reduced pesticide use protect biodiversity while supporting food production.*
- **Community engagement and education:** *Raising public awareness about ecosystem services can foster support for conservation efforts and nature-based solutions.*
- **Valuation and payment for ecosystem services (PES):** *Governments and organizations can set up mechanisms where landowners are compensated for maintaining or enhancing ecosystem services, such as carbon sequestration through reforestation.*

Opportunities for Economic and Social Development

Valuing ecosystem services goes beyond environmental protection; it creates economic opportunities for rural and/or wild regions.

- *Carbon trading markets allow landowners to sell carbon credits for forest preservation or reforestation projects.*
- *Eco-tourism capitalizes on Europe's rich natural heritage, turning protected areas into sources of income for local communities.*
- *Agroecology combines traditional farming with sustainable practices, enhancing soil health and biodiversity while providing economic stability for farmers.*
- *Including ecosystem services in real estate evaluation: Accounting for the ecosystem services present or potential on an estate can increase its value.*

References

de Rigo, D., Houston Durrant, T., Caudullo, G., & Barred, J. I. European Forests: An Ecological Overview. Retrieved from https://ies-ows.jrc.ec.europa.eu/efdac/download/Atlas/pdf/European_forests_an_ecological_overview.pdf

The Guardian. (2018, March 12). What is biodiversity and why does it matter to us? Retrieved from https://www.theguardian.com/news/2018/mar/12/what-is-biodiversity-and-why-does-it-matter-to-us

European Environment Agency. Indicators - European Environment Agency. Retrieved from https://www.eea.europa.eu/en/analysis/indicators

World Wildlife Fund. Terrestrial Ecoregions of the World. Retrieved from https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world

Requier, F., Fournier, A., Pointeau, S., Rome, Q., & Courchamp, F. (2022). Economic Costs of the Invasive Asian Hornet on Honey Bees. Available at SSRN: https://ssrn.com/abstract=4280914 or http://dx.doi.org/10.2139/ssrn.4280914

European Environment Agency. (2020). State of Nature in the EU - 2020. Retrieved from https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020

European Commission. Biodiversity Financing. Retrieved from https://environment.ec.europa.eu/topics/nature-and-biodiversity/biodiversity-financing_en

Arlati, A., Hugelius, G., & Karlsson, J. (2018). Permafrost and Arctic lakes: carbon transformations, geomorphology, and hydrology (Dissertation). Retrieved from https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A1253902&dswid=284

Further Reading

Convention on Biological Diversity (CBD). Retrieved from https://www.cbd.int/

National Geographic: Wolves of Yellowstone. Retrieved from https://education.nationalgeographic.org/resource/wolves-yellowstone/

European Environment Agency: State of Nature in the EU - 2020. Retrieved from https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020

European Commission: EU Biodiversity Strategy for 2030. Retrieved from https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

European Commission: Nature and Biodiversity. Retrieved from https://environment.ec.europa.eu/topics/nature-and-biodiversity_en

iNaturalist: Citizen Science Platform. Retrieved from https://www.inaturalist.org/

BTO: Nest Boxes - The Essential Guide. Retrieved from https://www.bto.org/sites/default/files/bto-nest-boxes-essential-guide.pdf

Irish Pond Manual. Retrieved from https://actionforbiodiversity.ie/app/uploads/2024/06/Irish-Pond-Manual.pdf

Maes, J., Teller, A., Erhard, M., Conde, S., Vallecillo Rodriguez, S., Barredo Cano, J. I., Paracchini, M., Malak, D. A., Trombetti, M., Vigiak, O., Zulian, G., Addamo, A., Grizzetti, B., Somma, F., Hagyo, A., Vogt, P., Polce, C., Jones, A., Carré, A., & Hauser, R. (2021). EU Ecosystem Assessment. Publications Office of the European Union. ISBN 978-92-76-30614-6. https://doi.org/10.2760/846428

CICES: Common International Classification of Ecosystem Services. Retrieved from https://cices.eu/

EUNIS: European Nature Information System. Retrieved from https://eunis.eea.europa.eu/index.jsp

European Environment Agency: MAES - Mapping and Assessment of Ecosystems and their Services. Retrieved from https://biodiversity.europa.eu/europes-biodiversity/ecosystems/maes

European Commission: Natural Capital Accounting. Retrieved from https://environment.ec.europa.eu/topics/nature-and-biodiversity/natural-capital-accounting_en

IPBES: Integrated Assessment and Valuation Framework. Retrieved from https://www.ipbes.net/policy-support/tools-instruments/integrated-assessment-valuation-framework

European Environment Agency: Indicators of Ecosystem Condition. Retrieved from https://biodiversity.europa.eu/europes-biodiversity/ecosystems/indicators-of-ecosystem-condition

European Environment Agency: Reference Data for Ecosystem Mapping. Retrieved from https://biodiversity.europa.eu/europes-biodiversity/ecosystems/reference-data-for-ecosystem-mapping

Module 5

Land management

Cláudia Vanessa Silva, Rodrigo Almeida

Key-words

Land management
Urban Sprawl; Policy making; Agriculture
Forestry
Coastal management

EU Green Deal

Climate; Environment and oceans; Biodiversity Strategy for 2030

Targeted SDG's

#3, #6, #11, #12, #13, #14, #15

Summary

The module on Land management comprises four units:

1

Forestry

This unit introduces the role of forests as essential ecosystems that provide environmental, social, and economic benefits. Learners will explore sustainable forest managementand the EU's Forest Strategy for 2030, addressing challenges and covering practical actions for local actors.

2

Food and agriculture

The impacts of conventional farming will be opposed to the ones of sustainable methodologies, and learners will explore EU policies such as the Common Agricultural Policy (CAP) and Farm to Fork Strategy while addressing how to promote local food systems, reduce the ecological footprint, and support sustainable agricultural practices.

3 **Urban Sprawl**

Unveiling the concepts and environmental, social, and economic consequences of urban sprawl. We'll explore EU frameworks like the Urban Agenda and strategies for sustainable land use.

4 **Marine issues / coastal management**

Covering the significance of marine and coastal ecosystems and the threats they face, this unit will also adress European policies like the Marine Strategy Framework Directive and explore methods for assessing marine health through KPIs.

Learning outcomes

- *Understanding forests, their importance and challenges, sustainable forest management (SFM), policies and promotion of sustainable forestry.*
- *Understanding transitioning to sustainable food, sustainable farming, local and Seasonal Food by Short Supply Chains, promotion of sustainable food.*
- *Understanding the concepts and environmental, social, and economic consequences of urban sprawl.*
- *Understanding marine and coastal ecosystems and their importance, challenges, policies and guidelines, evaluation and action.*

Introduction

Understanding forests

Europe is among the most forested regions of the world – around 40% of its land area is covered by forests. Because of its extent and relatively extensive management compared to other land types, forests play an essential role in Europe's nature, hosting most of the terrestrial species of animals, plants and fungi native to Europe. They are also responsible for a range of vital ecosystem services *that make life possible for us:*

- *Provisioning of raw materials such as timber, food, and medicine.*
- *Regulating services such as water and air purification, climate regulation, pollination, floods, erosion, and even disease control or enabling of soil formation, nutrient cycling, and primary production.*
- *Cultural and spiritual services by providing a sense of place and identity, as well as a source of inspiration for art, literature, music, and recreation activities.*

Forests play an important role both in climate change mitigation and adaptation. In Europe they are an essential carbon sink, currently absorbing around 10% of the total EU emissions.

Understanding food and agriculture

Agriculture plays a central role in Europe's economy and food supply, with a diverse range of farming systems across its regions. The European Union (EU) has approximately 10.5 million farms, covering about 40% of the EU's total land area. However, these vary significantly in size, type, and productivity. The largest agricultural producers in Europe include France, Germany, Spain, and Italy, which together account for nearly half of the EU's total agricultural output. In countries like Romania and Poland, small family farms dominate, while larger, more industrialized farms are common in countries like France and Germany.

Livestock farming is concentrated in regions such as Ireland and the Netherlands, where dairy and meat production play a critical role. In contrast, southern European countries like Spain, Italy, and Greece focus more on fruit, vegetables, and olive oil production due to their Mediterranean climate. Cereals such as wheat, barley, and maize are the main crops grown in Europe, with wheat being the most important in terms of both land use and production.

The EU is one of the world's leading wheat producers, contributing around 20% of global wheat exports. Additionally, Europe is a major producer of wine, accounting for more than 60% of the world's wine production.

Despite the diversity and productivity, European agriculture faces challenges such as an **aging** *farming population and a decline in the number of farms, with the average age of farmers in the EU over 55 years and younger generations showing less interest in pursuing farming careers. Soil degradation, water scarcity, biodiversity loss, and the spread of pests and diseases also pose significant threats, mainly driven by* **climate change** *and* **unsustainable farming practices**.

Understanding urban sprawl

As places of accumulation of resources, as well as increased consumption, **cities** *play a crucial role in the European Green Deal strategy to achieve climate neutrality.* **Urban sprawl** *refers to the uncontrolled expansion of urban areas into surrounding agricultural land, forests, and natural habitats, resulting in disconnected, fragmented* **low-density** *communities heavily relying on* **car transportation**.

The **causes** *of urban sprawl range from* **population growth** *and* **economic** *pressures to the availability of cheaper land on the outskirts of cities. Other drivers include rising* **housing costs** *in urban centers, increased* **car ownership**, *and* **infrastructure investments**, *such as road expansion, which facilitate suburban growth.*

This phenomenon leads to **environmental impacts** *such as the destruction of natural habitats, deforestation, and loss of biodiversity. Urban sprawl increases air and water pollution due to a higher reliance on cars and impermeable surfaces that contribute to runoff and flooding.* **Economically**, *it results in inefficient land use, increasing the costs of infrastructure development like extending utilities, roads, and public services across larger areas.* **Socially**, *sprawl exacerbates social isolation and creates communities with limited access to public transportation, often deepening inequalities and reducing access to services and employment opportunities.*

In Europe, an estimated 25% of the continent's land area is already urbanized.

Understanding marine ecosystems

A complex network of oceans and main seas occupies about **71% of the Earth's surface**, *motivating the known denomination of "Blue Planet" when seen from space. Ranging from coral reefs and seagrass meadows to estuaries and salt marshes, they play a vital role in* **regulating** *climate,* **providing** *food, and* **supporting** *biodiversity.* **Coastal ecosystems** *serve as* **buffers** *against storms, reduce coastal erosion, and contribute to carbon sequestration through blue carbon ecosystems like mangroves and salt marshes.* **Marine ecosystems** *support over* **50% of global biodiversity** *and are crucial for the livelihoods of billions of people, especially in coastal communities.*

State of the art

Forests

Amidst our busy lives, it's easy to overlook how deeply interconnected all living things are, and how vital trees are to the natural systems that sustain us. ***But what exactly is a tree?*** *A woody plant with a single stem or trunk, which supports branches and leaves. Trees can vary widely in size and shape, from mighty sequoias that can reach over 90 meters tall, to delicate bonsai trees that fit on a tabletop.*

And forests? *According to FAO, a forest is defined as a piece of land larger than 0.5 ha with a canopy coverage of at least 10% with trees bigger than 5 meters of height, excluding lands with other predominant land uses such as agriculture or urbanism. From an ecological perspective,* ***forests are far more than just a collection of trees****; they represent a complex network of interactions and interdependencies among diverse trees, plants, animals, and microorganisms.* ***Each*** *element plays a crucial role in sustaining the delicate balance and dynamic* ***equilibrium*** *of the entire ecosystem.*

As we are able to notice when we travel, forests and species distributions change considerably across the planet. This ***variation of species distribution*** *relates to a combination of* ***abiotic factors*** *such as temperature, humidity, radiation, water availability, topography, soil characteristics, along with the interactions with the* ***biotic factors****, living organisms such as plants, animals, fungi, and bacteria. These factors create different ecosystems, which, dividing our globe into various ecological regions in turn, give rise to different* ***biomes****.*

These factors are not static and can ***change*** *due to natural or human-induced pressures over time. Taking the case of a newly formed volcanic island for example, it's unlikely that trees and forests would be the first to appear. Instead, an important process called* ***species succession*** *would occur, where* ***pioneer species*** *such as lichens and mosses would colonize the bare rock, breaking it down and changing the site conditions. As the soil develops, it becomes more suitable for other potential plant life to establish itself, leading to a series of changes in the community composition, eventually resulting in the development of a self-sustaining system, the* ***climax community****.*

At distinct points in time, the same location is populated by different species specific to that stage in the developmental process. When restoring a degraded ecosystem, it's important to understand at what stage the disruption occurred and what is the climax community we're striving for.

Sustainable forest management (SFM)

In Europe, the concept of SFM was defined in 1993 at the FOREST EUROPE (MCPFE) as "The stewardship and use of forest lands in a way and at a rate that maintains their productivity, biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill now and in the future relevant ecological, economic and social functions at local, national and global levels and that does not cause damage to other ecosystems".

In the absence of a cohesive EU-level policy that is just now being developed, EU countries are responsible for forest policies. At the local level, various independent and privately run schemes of forest certification have been developed. In 2009, 42% of EU forests were certificated by these two:

- *The Forest Stewardship Council (FSC);*
- *The Programme for the Endorsement of Forest certification schemes (PEFC).*

Policies

The EU set ambitious targets for forest restoration as part of its broader efforts to address climate change and biodiversity loss. The Nature Restoration Law addressed in the previous chapter is complemented by EU forest strategy for 2030 with the aim to improve the quantity and quality of EU forests by increasing forest coverage while respecting ecological principles and improving the resilience of forests.

Protect and restore our forests by

- Strictly protecting remaining **EU primary and old-growth forests**
- Establishing legally binding **nature restoration targets** for forests
- **Planting 3 billion** additional trees by 2030
- Creating **payment schemes** for forest owners and managers for the **provision of ecosystem services**

Ensure that forests are managed sustainably by

- Encouraging the **bio-economy** sector to embrace sustainable principles
- Promoting the uptake of **sustainably harvested wood** in the **construction sector**
- Promoting win-win measures for all in **sustainable forest management**

Understand what is happening in our forests by

- Improving the **monitoring of the state of EU forests** including through better remote sensing
- Ensuring Member States develop **Strategic Plans** for their forests
- Encouraging **citizen involvement** through Map-My-Tree, to keep track of the **3 billion trees** roadmap
- Creating an inclusive space for **all stakeholders to discuss**

Goals of EU forest strategy for 2030

The EU and its Member States are implementing various policies and initiatives that support forest restoration to achieve these goals. These include funding for reforestation and afforestation projects, support for sustainable forest management practices, and the development of green corridors and other landscape-scale approaches to forest restoration.

The strategy is accompanied by two staff working documents: Staff Working Document on the Stakeholder Consultation and Evidence Base and Staff Working Document on the 3 Billion Tree Planting Pledge for 2030, and contemplates the specific policies in:

- *Deforestation, December 2024 - Rules to guarantee that the products consumed in the EU do not contribute to global deforestation.*
- *Forest monitoring - Ensuring that timely and accurate information on the condition and management of EU forests is available. The "Forest monitoring law -A monitoring framework for resilient European forests" was proposed to compliment the Forest Information System for Europe (FISE) ,the first common database on forest information in Europe. FISE offers user-friendly and fast access to harmonized, up-to-date, and spatially and temporally representative data on the state of and trends in forests. As a result, it can enable policymakers to make informed decisions based on reliable information.*
- *Forest fires - How the EU prevents and monitors wildfires and provides assistance when they strike.*
- *Under the European Green Deal, the EU has committed to planting 3 billion additional trees by 2030. Join the pledge and register the trees that you or your organization planted!*

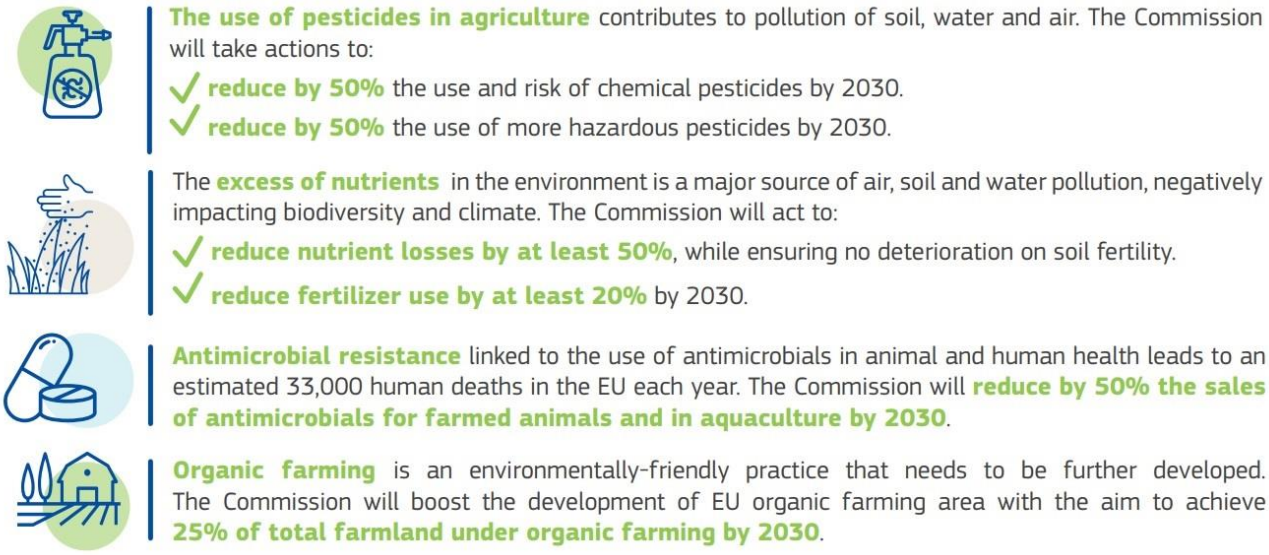
Food and agriculture

The Common Agricultural Policy (CAP) is the EU's flagship agricultural policy, supporting farmers with financial incentives and regulatory frameworks. The latest reform (2023-2027) emphasizes sustainability and environmental protection, introducing eco-schemes that reward farmers for practices such as organic farming, agroforestry, and crop diversification. CAP also aims to protect biodiversity, reduce greenhouse gas emissions from farming, and promote fair income for farmers.

The CAP budget accounts for about 35% of the EU's total budget, underscoring the importance of agriculture to the region's policy agenda.

At the core of the European Green Deal, the Farm to Fork Strategy seeks to create food systems that are fair, healthy, and environmentally sustainable. It is built around four key pillars:

- *Sustainable food production: Promoting environmentally-friendly farming and reducing the use of chemicals.*
- *Sustainable food processing and distribution: Encouraging shorter supply chains and reducing food waste.*
- *Sustainable food consumption: Promoting healthier diets and reducing overconsumption.*
- *Food loss and waste prevention: Minimizing food loss along the entire supply chain, from production to consumption.*



Goals of the Farm to Fork Strategy

In July 2023 the Commission had also adopted a package of measures for a sustainable use of key natural resources, The package includes a new Soil Monitoring Law, which will help us have healthy soils in the EU by 2050, a regulation on plants produced by genome techniques, and measures to reduce food and textile waste.

Other directives on how the European Commission ensures the safety and quality of agricultural and food products, supports producers and communities, and promotes sustainable practices can be seen here.

Urban sprawling

The European Green Deal emphasizes the importance of sustainable land use and urban planning as key pillars for reducing the environmental impact of cities. It is aided by the EU's Urban Agenda , which advocates for smarter, denser cities that minimize land consumption by forming partnerships between multilevel stakeholders who work together to create action plans that aim to improve urban regulations, enhance funding sources for cities, and share knowledge through data, studies, and best practices.

The New Leipzig Charter on The transformative power of cities for the common good was adopted at the Informal Ministerial Meeting in 2020 , offering a common framework and principles towards sustainable urban development. The latest agreements on this document were set in 2023 in Gijon, defining next steps for the future and several operational agreements for its implementation.

EU Diversity Strategy for 2030 includes a nature restoration plan to help urban authorities introduce nature-based solutions (NBS) that can sustainably improve the quality of life in cities. The Urban Nature Platform also supports towns and cities in restoring nature and biodiversity. You can learn more on how the Commission helps cities to grow sustainably through sharing of knowledge, funding, and other urban policies and initiatives here.

Green City Accord - Join the EU initiative to make cities greener, cleaner and healthier.

Coastal and marine environments

Europe has implemented various initiatives aimed at preserving marine and coastal ecosystems. Marine Protected Areas (MPAs) now cover 12% of European seas, but more action is needed to ensure effective management and enforcement.

*The Biodiversity strategy for 2030, a pilar for the European Green Deal, aims to have **10%** of the European seas strictly protected, and **30%** covered by MPAs.*

The Common fisheries policy (CFP) is a set of rules aimed to prevent overfishing, promote sustainable fisheries, and support the livelihoods of coastal communities. By setting quotas and regulating fishing methods, the policy seeks to restore fish stocks to sustainable levels.

Continue rebuilding fish stocks to sustainable levels → long-term fish availability and prosperity for fishers and communities.

Reduce environmental and climate impacts of fisheries and aquaculture activities → protecting 30% of the EU's seas, with 10% being strictly protected by 2030 as defined by the EU Biodiversity Strategy.

Increase the sector's energy efficiency to become more resilient, less dependent on fossil fuels and climate-neutral by 2050.

Make the fishing profession more attractive.

Actions for sustainable and resilient fisheries, aquaculture and marine ecosystems on the Green Deal.

The European Union has also developed several key policies to address marine and coastal management, particularly through the Marine Strategy Framework Directive (MSFD), which aims to achieve "Good Environmental Status" of EU marine waters, focusing on biodiversity conservation, sustainable fishing practices, and pollution reduction and promoting ecosystem-based management approaches.

In 2021 a new approach for a sustainable blue economy in the EU was approved, which will help to deliver both the European recovery and the European Green Deal. The objective is a strong sustainable, resilient and climate-neutral model blue economy.

Challenges

Forests

Despite their importance, forests face different pressures such as climatic changes, wildfires, disease, or pest, being the **main driver** *for its* **degradation** *trends related to our* **land management practices**: *Since 1990, it is estimated that 420 million hectares of forest have been lost through conversion to other land uses. In Europe,* **urbanization** *is the main cause for deforestation, followed by* **conversion** *to livestock grazing or cropland and* **over-exploitation** *of wood resources.*

Around half of the wood produced in the EU is used for energy, and many countries have been rapidly increasing their use of biomass energy.

Food and agriculture

While providing essential resources, modern farming practices often lead to **soil degradation**, **water pollution**, *and* **biodiversity loss**. *In the European Union, 12.7% of land suffers from soil erosion due to practices like monocropping and over-tilling, which deplete nutrients and contribute to* **desertification**. *Agriculture also consumes 70% of the world's freshwater, with regions like southern Europe facing severe* **water shortages** *due to* **over-extraction** *for irrigation, often exacerbated by poorly planned projects and unsuitable crop varieties.*

Industrial farming's focus on **yield over nutrition** *has led to* **nutrient-poor** *foods that contribute to health problems. To sustain high yields, the sector relies heavily on* **agrochemicals** *like pesticides, herbicides, and fertilizers. These chemicals, however, harm* **non-target species**, *pollute water sources, and degrade soil health. For instance, neonicotinoids have been linked to the decline of pollinators, while glyphosate raises concerns about health risks and* **herbicide-resistant** *weeds. Excessive fertilizer use leads to nutrient* **runoff**, *causing eutrophication in water bodies and further biodiversity loss. Despite regulations, many European regions still struggle with chemical surpluses and their environmental impacts.*

Urban sprawl

According to Eurosta, around 75% of the EU population lives currently in urban areas, and this figure is expected to increase to 83% by 2050.

Climate change will significantly influence urban sprawl and population distribution, inducing migration from places affected by rising temperatures, more frequent extreme weather events, and rising sea levels. Coastal regions, particularly in southern Europe, are vulnerable to these impacts, potentially driving populations toward inland cities and more temperate northern regions. This shift could further strain urban infrastructure and amplify sprawl in previously less populated areas.

Marine and coastal ecosytems

Marine and coastal ecosystems are highly sensitive to changes in environmental conditions and human activities, and the pressure they are facing threatens their capacity to provide essential services. Over 30% of global fish stocks are overexploited, and many European marine habitats, particularly in the Mediterranean and the Baltic, face pollution from plastics (over 8 million tons of plastic entering the oceans each year) , industrial runoff (leading to eutrophication and the creation of dead zones, where oxygen depletion is killing marine life), and untreated sewage. Additionally, ocean acidification and rising sea temperatures due to climate change are causing coral bleaching and the loss of biodiversity in European waters, and coastal erosion, driven by both natural processes and human activities, has intensified, with up to 20% of Europe's coastline currently experiencing it.

Land management

The Copernicus Land Monitoring Service provides valuable free satellite data to track land-use changes, helping local and regional governments monitor urban sprawl and its effects on ecosystems and communities. This monitoring is essential for managing impacts and guiding policies toward sustainable development.

The Key Performance Indicators (KPIs) for urban sprawl include land-use efficiency, which measures the amount of land consumed per capita; urban density, assessing the concentration of people in a given area; and natural habitat conversion rates, tracking how much agricultural or forest land is converted to urban use. Other indicators, such as transportation accessibility, the ratio of green spaces to built environments, and air and water quality metrics, are also critical in evaluating the sustainability of urban expansion.

Coastal management plan

To create an effective coastal management plan, it is imperative to begin with a baseline assessment of the health and sustainability of marine and coastal ecosystems. This requires a comprehensive understanding of both ecological and socio-economic factors, for which you can use the following Key Performance Indicators (KPIs):

- **Biodiversity levels:** *Monitoring species diversity and population trends, particularly keystone and endangered species.*
- **Water quality:** *Measuring pollutants such as nitrogen, phosphorus, and plastic debris to assess eutrophication and chemical contamination.*
- **Fish stock sustainability:** *Tracking populations of commercially important species to ensure fishing remains within sustainable limits.*
- **Coastal erosion rates:** *Assessing changes in coastline stability to evaluate the effectiveness of erosion control measures.*
- **Carbon sequestration:** *Evaluating the carbon capture potential of blue carbon ecosystems, such as seagrass meadows and salt marshes, crucial for climate regulation.*

*This assessment will help **identify** areas of vulnerability and opportunity, guiding the **prioritization** of regions and actions. It should be supported by continuous **community engagement**, including industries and environmental organizations, to foster collaborative decision-making and implementation. Additionally, implement consistent monitoring programs to track KPIs and adapt management strategies is critical.*

*Ideally, adopt a Ecosystem-Based Management (EBM) approach that considers the **cumulative impacts** of all human activities on marine ecosystems, rather than focusing on isolated issues like overfishing or pollution. Align local management strategies with broader EU policies and initiatives, particularly within shared ecosystems like the Mediterranean and Baltic Seas, to ensure a **cohesive and sustainable approach** to coastal management.*

Suggested actions

Promoting sustainable forestry

Municipalities, Environmental advisors and NGOs play a crucial role in promoting sustainable forestry at a local level, balancing ecological health with community needs by:

Implementing Local Forest Management Plans

Developing and enforcing comprehensive forest management plans that prioritize sustainable use of resources, biodiversity conservation, and community engagement. These plans should include clear objectives, protected zones, and guidelines for selective logging or non-timber resource use.

Creating Protected Areas and Green Corridors

By designating local conservation areas and green corridors, high-conservation-value forests can be protected while creating habitats for wildlife. Green corridors also improve connectivity between ecosystems, promoting biodiversity and enabling species migration.

Supporting Community and Urban Forestry

Tree planting initiatives in urban areas or engaging citizens through community forestry programs will improve air quality, reduce urban heat islands, and strengthen the community's connection to local forests.

Enforcing Sustainable Harvesting Practices

Regulating forestry activities, enforcing policies that prevent illegal logging, over-harvesting, and the use of harmful agrochemicals while encouraging sustainable practices like selective harvesting or agroforestry.

Partnering with Certification Programs

Encouraging landowners to pursue certification programs like FSC, providing financial or logistical support where needed. Certified forests often benefit from better management practices and can attract eco-conscious businesses and tourism.

Transitioning to sustainable food

Sustainable Farming

Sustainable farming is essential for reducing agriculture's environmental impact while enhancing soil health, biodiversity and nutritional values. Three key approaches in Europe include organic farming, agroecology, and regenerative agriculture.

Organic farming avoids synthetic chemicals and GMOs, relying on natural methods like crop rotation and composting to maintain soil health and water quality. It provides food free from harmful chemicals and supports ecosystem balance. Agroecology applies ecological principles to agriculture, encouraging biodiversity and minimizing the use of external inputs. Practices such as intercropping, polyculture, and agroforestry improve both yields and ecosystem resilience. Regenerative agriculture goes beyond sustainability, aiming to restore ecosystems. Its practices, such as no-till farming and livestock integration, sequester carbon, enhance water retention, and boost biodiversity.

Local and Seasonal Food by Short Supply Chains

Promoting local and seasonal food systems **reduces the environmental** *impact of food production while* **strengthening local economies**. *Local food systems connect consumers directly with nearby farmers, enhancing food security and fostering trust between producers and buyers. Eating seasonally aligns food production with* **natural cycles**, *reducing the need for* **artificial inputs** *and enhancing the freshness and* **nutrition** *of produce.* **Short supply chains** *reduce* **food miles**, *greenhouse gas emissions, and support small-scale farmers by cutting out intermediaries, allowing producers to receive* **higher profits** *and consumers to access* **fresher food**.

How to promote it

Offering **educational programs** *and* **workshops** *can encourage farmers to adopt sustainable farming, while promoting* **organic certification** *provides a platform for marketing produce.* **Financial incentives**, **technical advice**, *and public recognition can also help motivate farmers to transition to regenerative agriculture.* **Collaborating** *with NGOs, universities, and agricultural institutions can facilitate knowledge sharing and ensure the success of these sustainable farming approaches.*

Local governments can develop **farmers' markets**, *community-supported agriculture (CSA) programs, and* **food hubs** *to* **connect** *consumers directly with local producers. Encouraging local restaurants and public institutions like schools and hospitals to* **source food locally** *ensures a consistent demand for seasonal produce.* **Public awareness** *campaigns highlighting the benefits of eating seasonal foods can further strengthen the local food system, while implementing* **procurement policies** *that prioritize local food for public services can institutionalize these efforts.*

Direct-to-consumer sales, *farm-to-table programs, and other* **short supply chain** *initiatives help boost farmers' profits and provide consumers with fresher, more sustainable food options. Encouraging* **collaboration** *between local restaurants, retailers, and farmers ensures steady demand for local produce, creating a resilient, environmentally friendly food system.*

Mitigating urban sprawling

Mitigating urban sprawl requires comprehensive policies that balance urban growth with sustainability goals.

One effective strategy is the development of Green Cities*, where urban planning focuses on compact, mixed-use neighborhoods that prioritize high-density development, efficient land use, and the integration of green spaces. These cities emphasize walkability, public transportation, and the preservation of natural environments within urban areas. By reducing car dependency and promoting energy efficiency, green cities help curb the negative impacts of urban sprawl.*

Nature-based solutions *will mitigate the impacts of urban sprawl by integrating natural systems into urban planning to enhance biodiversity, improve air and water quality, and reduce the urban heat island effect.* Examples *include the restoration of wetlands, green corridors, urban forests, and riverbank rehabilitation, all of which help to manage urban runoff, mitigate flooding, and support local ecosystems. Nature-based solutions also play a crucial role in addressing climate change adaptation, with the potential to absorb carbon, reduce energy consumption, and enhance the resilience of urban areas.*

A strong focus should be put in implementing sustainable development policies *with smart growth principles. These policies encourage higher-density housing, mixed-use zoning, and the promotion of public transport infrastructure. The European Commission's New Urban Agenda, earlier addressed,, promotes these principles by supporting cities in transitioning to sustainable growth patterns, which prioritize people and the environment. Additionally,* public procurement *policies that prioritize green infrastructure and sustainable construction practices can help guide urban development in an ecologically responsible direction.*

Finally, it's essential to ensure that local communities are involved *in decision-making processes to help build public support for policies that limit sprawl, create green spaces, and protect natural habitats. Cities such as Paris and Copenhagen have successfully implemented participatory urban planning models, leading to better community engagement in creating resilient, sustainable urban spaces.*

References

European Environment Agency. How are European forests doing? European Environment Agency, 2021. Available at: https://www.eea.europa.eu/publications/how-are-european-forest/.

European Parliament. Deforestation: Causes and how the EU is tackling it. European Parliament, 2022. Available at: https://www.europarl.europa.eu/topics/en/article/20221019STO44561/deforestation-causes-and-how-the-eu-is-tackling-it.

European Commission, Joint Research Centre. Forest growing stock, increment and fellings (JRC122719). Publications Office of the European Union, 2021. Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC122719.

European Commission. Sustainable forest management. European Commission. Available at: https://single-market-economy.ec.europa.eu/sectors/raw-materials/related-industries/forest-based-industries/sustainable-forest-management_en.

European Commission. Report on Sustainable Transition. European Commission, 2021. Available at: https://eurocid.mne.gov.pt/sites/default/files/repository/paragraph/documents/9193/reportsusttransiten.pdf.

European Commission. Factsheet on the New CAP: Environment and Fairness. European Commission. Available at: https://agriculture.ec.europa.eu/document/download/89b607ec-8a43-4073-bafd-f2493da7699e_en.

European Environment Agency. Land take and land degradation. European Environment Agency, 2021. Available at: https://www.eea.europa.eu/publications/land-take-and-land-degradation.

European Environment Agency. Marine protected areas. European Environment Agency, 2020. Available at: https://www.eea.europa.eu/publications/marine-protected-areas/marine-protected-areas.

Module 6

Mobility in Zoersel from policy to practice

Bart Van Santvliet & Tim Chabot

Key-words

Mobility
Sustainable
Policy
STOP
Hop-in point

EU Green Deal

Action Accelerating the Shift to Sustainable Smart Mobility

Targeted SDGs

#3, #4, #9, #10, #11, #13, #15, #17

Summary

This module describes mobility in Zoersel from policy to practice. It explains the mobility policy at various policy levels in Belgium and Zoersel and how this policy is translated into practice.

1 Stop principle

In mobility, the car is king. This causes greater CO_2 - emissions. The use of the stop - principle for general mobility policy can ensure a reduction in overall emissions here.

2 Partial mobility

Besides encouraging the right means of transport at the right time, it is also vitally important to stay committed to going on the track with as few means of transport as possible because of sustainable motivation.

3 Mobility municipality of Zoersel in broader framework

The mobility policy of the municipality of Zoersel is part of a bigger picture. In the various transport regions, Flemish policy and federal policy on mobility.

Learning outcomes

- *Understanding and the application of the STOP principle*
- *Importance of sustainable mobility and safe and accessible transport systems*
- *Understanding the role of shared mobility: concept and importance in enhancing public transport usage.*
- *Identifying the benefits of shared mobility in increasing the movement radius of consumers*
- *Recognizing barriers to taking public transport and discussing strategies to remove these barriers.*
- *How to integrate shared mobility options with public transport*
- *Define Hop-in points and multi-modal transport*
- *Mobility policy in the different governance levels in Belgium and their impact on local practices in Zoersel.*
- *The sustainable mobility policies promoted by the Flemish government.*

Involving local residents and stakeholders in the mobility planning process.

Module content

Introduction

In Flanders Belgium, mobility policy is managed at multiple levels, including the federal government, the Flemish government, and various transport regions. This policy is implemented locally within the municipality of Zoersel. The division of mobility policy across these levels complicates the implementation of practical solutions.

Each type of public transport has its own usage and payment methods, managed by different companies, some of which are semi-public. For instance, the bus service is operated by 'De Lijn', the train service by 'NMBS', shared electric bikes by 'Donkey Republic', and shared cars by the 'Share Mobility' app. This fragmentation means that users often need to navigate multiple apps and payment systems, which can be inconvenient and time-consuming.

If all these different transportation modes could be paid for using a single app or a unified system, it would simplify switching between options and create an efficient multimodal transport system. Such a system would allow users to seamlessly transition from one mode of transport to another, enhancing the overall travel experience and potentially increasing the use of public transport.

The biggest challenge in facilitating multimodal transport is merging these various apps and ticketing or subscription systems. This would require significant coordination and cooperation between different transport providers and government agencies. Additionally, there would need to be a robust technological infrastructure to support such a unified system, ensuring it is user-friendly, secure, and reliable.

Moreover, a unified payment system could also provide valuable data on travel patterns and preferences, which could be used to optimize transport services and infrastructure. For example, data analytics could help identify peak travel times and popular routes, enabling better scheduling and resource allocation.

In conclusion, while the current division of mobility policy in Belgium presents challenges, there is significant potential for improvement through the integration of payment systems and the promotion of multimodal transport. This would not only make travel more convenient for users but also contribute to a more sustainable and efficient transport network.

The STOP principle dictates a hierarchy in mode of transportation, S stands for "stappen" which is dutch for "walking", T stands for "Trappen" which means "biking", O is for "Openbaar Vervoer" which translates to "public transportation" and P comes from "personenwagen" meaning personal cars. In a mobility plan, this hierarchy should be implemented, meaning the road should facilitate pedestrians over cyclists, over public transportation over cars. This principle can be applied to various areas within a public organization. It can be used in organizing administrative services, formulating objectives, allocating resources, planning mobility policies, developing and applying new technologies, and designing and realizing mobility projects. It helps streamline processes and improve efficiency within administrative departments, provides a framework for setting clear and achievable goals that align with the organization's strategic vision, ensures effective and responsible use of financial, human, and material resources, supports the development of sustainable and efficient mobility strategies, and offers guidelines for designing and executing projects that contribute to improved mobility and infrastructure.

State of the art

Stop principle

On 1 August 2022, Belgium had 5,947,479 passenger cars, up from 5,927,912 a year earlier. That is an increase of 0.3%. Over the past decade, the average annual increase in the number of passenger cars has been 0.8%.

To promote sustainable mobility, the preferred modes of transport are prioritized in the following order: stairs (walking), pedals (cycling), public and communal passenger transport. This hierarchy is encapsulated in the STOP principle, which ranks transport modes from most to least desirable: Stappers (pedestrians), Trappers (cyclists) and Public (and collective, but also shared) transport, and lastly, Private Motorised Transport.

The STOP principle is inspired by Lansink's Ladder from waste management, which prioritizes waste treatment methods from highest to lowest: prevention, reuse, recycling, incineration, and landfill. The modern interpretation of Lansink's Ladder has evolved to include: qualitative prevention, product reuse, material reuse, recovery as fuel, incineration for disposal, and landfill.

The STOP principle can be applied to various aspects, including the organization of administrative services, setting objectives, resource allocation, mobility policy planning, technology development, and project implementation.

Serving as a guide to achieving a modal shift, the STOP principle is part of the "Modal Shift" vision of the Sustainable Mobility Network. It is sometimes also referred to as the Mobility Piramid.

Sustainable mobility - The STOP principle
(Source: Network sustainable mobility, STOP-principe: Stappers, Trappers, Openbaar vervoer en Privé gemotoriseerd vervoer | Netwerk Duurzame Mobiliteit (duurzame-mobiliteit.be)).

The idea is to discourage car use by introducing various obstacles and promoting other modes of transportation as much as possible.

Cyclist, for example, can be supported through the development of appropriate cycling infrastructure, such as bicycle streets. On these streets, motorists are restricted to speeds of no more than 30 km/h and are prohibited from passing cyclists. This makes traffic safer for cyclists, encouraging more people to choose biking.

Starting young is the key, which is why the municipality of Zoersel invests in proper cycling education for very young children. The municipality of Zoersel supports the schools by organizing the bicycle exams. Additionally, there is a reward system where children can earn points for biking to school, which they can exchange for items at local merchants.

Car use can also be discouraged by developing strong urban cores where everything is walkable or bikeable. Implementing neighborhood-level circulation plans with speed limits for motorists can further discourage car use, making it safer for vulnerable road users and positively influencing the adoption of alternative transportation methods like cycling and walking.

Share mobility

There are situations where distances are too great for relying solely on walking or cycling. In such cases, public transport becomes essential. Therefore, it is important to eliminate barriers to using public transport.

By making shared mobility available, for example near train stations, the movement radius of consumers is increased. This provides access to locations that are otherwise only easily accessible by (private) car.

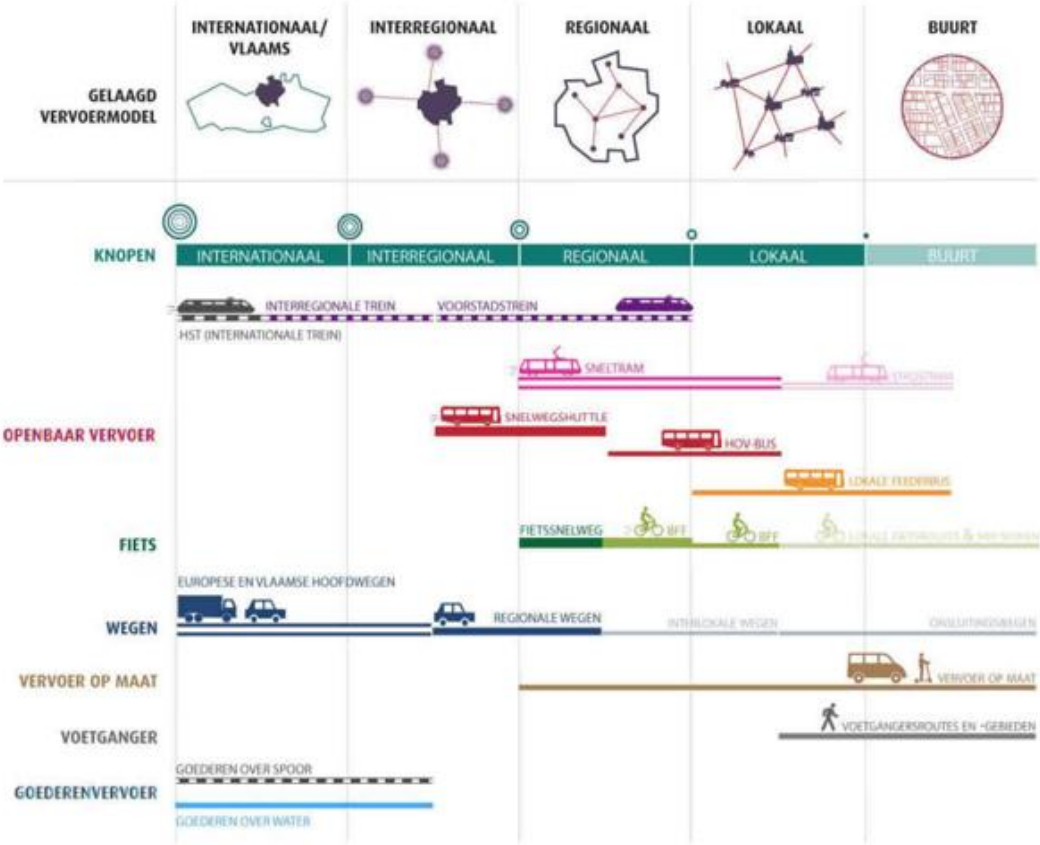
Additionally, the use of Hop-in points, where various shared transport options are available, facilitates seamless transitions between different modes of transport. This allows for smooth travel from point A to point B. The combination of different types of transport is a personal choice and can vary depending on individual preferences and needs.

Share-mobility for own staff and residents in Zoersel. (Source: Municipality of Zoersel).

Donkey electric bicycles next to a bus stop. (Source: Municipality of Zoersel).

Mobility policy of Zoersel municipality within broader mobility policy framework

The mobility policy of the municipality of Zoersel is part of a larger framework that aligns with both the Federal policies, the Flemish policies on mobility, in combination with the vision of the different transport regions.



A hiërarchic layered network. (Source: Mobility plan/policy plan Zoersel - Design Routeplan 2030, version April 2020).

Mobility in Belgium, including the municipality of Zoersel, is a complex issue due to the country's federal structure, which involves both federal and regional governments in various aspects of its management. This often leads to challenges in terms of coordination, funding, and policy implementation.

Belgium also participates in international cooperation on mobility, particularly within the European Union, where agreements are reached on cross-border infrastructure, transport regulations, and other issues affecting mobility.

In Belgium, mobility is managed by various government agencies and levels, including the federal government and regional governments (Flemish Region, Walloon Region and Brussels Capital Region).

The federal government has jurisdiction over certain aspects of mobility, such as the management of the national railways (NMBS/SNCB) and some major roads. It is also responsible for federal legislation relating to traffic and transport, such as traffic rules and regulations, driving licenses and vehicle registration. The Nationale Maatschappij der Belgische Spoorwegen (NMBS)/ Société Nationale des Chemins de fer Belges (SNCB) is Belgium's national railway company, responsible for managing the national train network.

The regional governments (Flemish Region, Walloon Region and Brussels Capital Region) have jurisdiction over the master aspects of mobility. These regions each have their own ministries or administrations for mobility, which are responsible for managing some local roads, public transport, some cycle paths and so on. Although mobility in Belgium is mainly managed at the regional level, there is coordination and cooperation between the federal government and regional governments, especially in areas where their competences overlap or where cooperation is needed for efficiency and effectiveness.

The Flemish Government has competence over mobility in the Flemish Region. Its policy and implementation are coordinated by the Flemish Ministry of Mobility and Public Works. The Agency for Roads and Traffic (AWV) is an agency of the Flemish Government responsible for the management, maintenance and development of the road network in Flanders. This road network includes motorways, regional roads and some local roads.

De Lijn is Flanders' public transport company and is responsible for providing bus and tram services in the region. It manages routes, timetables and fares for public transport within the Flemish Region.

The Flemish government develops policies to improve mobility, such as promoting sustainable mobility (such as cycling and public transport), reducing congestion on roads and improving road safety. The Flemish government invests in infrastructure projects to improve mobility, such as expanding motorways, building cycle paths, modernizing public transport and improving road safety measures.

The Flemish government works together with local authorities, such as municipalities and cities, to address mobility issues at local level, such as developing local mobility plans, improving local road infrastructure and promoting alternative modes of transport. The mobility policy in the Flemish Region is characterized by an emphasis on sustainability, efficiency and road safety. The aim is to provide easily accessible and safe mobility for all inhabitants, encouraging and integrating different modes of transport to promote a smooth flow of traffic.

Furthermore, the Flemish Region is further divided into several transport regions. A transport region is a geographical area within which public transport is organized and coordinated. This concept is often used to designate a regional level of public transport planning and management. In a transport region, public transport is organized and coordinated by an overarching body, such as a regional agency of transport authority. This body is responsible for planning, developing and managing the public transport network within the region. The transport region develops the public transport network design, including routes, stops and timetables for buses, trams, trains of other forms of public transport. The aim is to create an efficient and accessible public transport system that meets the mobility needs of residents within the region.

The transport region cooperates with public services that provide transport, such as bus and tram companies, railway companies and other public transport operators, to operate and maintain the public transport network. The transport region develops mobility policies and strategies to promote sustainable mobility, such as encouraging the use of public transport, cycling and walking, and reducing car mileage. Stakeholders, including local governments, communities, businesses and the public, are often involved in the planning process for public transport within the transport region to ensure that the transport network meets users' needs and expectations. Quite recently, citizens can use De Lijn's flexi-buses. Here, a bus will pick you up at your chosen stop and drop you off at another flexi stop when no other alternatives or combinations are possible.

In short, a transport region is a geographical area within which public transport is organized and managed to facilitate and improve residents' mobility.

At the level of the municipality of Zoersel, mobility encompasses various aspects related to traffic and transport within the municipality. Here are some key points that define mobility in the municipality of Zoersel:

The municipality of Zoersel has a network of roads that facilitates local traffic. This includes both main roads and local streets. The maintenance and development of this infrastructure are the responsibility of the municipality, in cooperation with higher levels of government such as the Flemish government for regional roads. The accessibility of the municipality of Zoersel is partly supported by public transport, such as buses providing connections to surrounding towns and villages. Public transport timetables and routes are managed by De Lijn, Flanders' public transport company.

To promote sustainable mobility, the municipality of Zoersel invests in cycle paths and infrastructure. This includes the construction of safe cycle paths along roads and the creation of bicycle-friendly routes connecting important locations within the municipality.

Bike-street in Zoersel. (Source: Municipality of Zoersel).

Slow routes' for soft mobility in Zoersel. (Source: Municipality of Zoersel).

The municipality of Zoersel regulates parking within its boundaries through parking facilities. This includes the designation of parking zones, management of parking spaces, both in the center and at key facilities such as shopping centers and schools.

Traffic safety is an important concern for the municipality of Zoersel. This includes measures such as speed limits, speed humps, traffic signals and traffic lights to ensure the safety of pedestrians, cyclists and motorists. Similarly, bicycle lanes adjacent to schools are set up, where cars are not allowed to pass cyclists. Volunteers are used at crossings to allow pedestrians and cyclists to cross safely at busy pedestrian crossings just before and after school hours. In this way, road safety is increased for school children, many of whom go to school on foot or by bike. To make biking more sustainable, in Zoersel there's a bike-lending service from the municipality for bicycles for children, this saves the parents a lot of costs when their children are too big for the previous bike, they can lend a bigger bicycle.

The municipality of Zoersel develops mobility plans aimed at improving mobility within the municipality in a sustainable and efficient way. This often includes participation of residents and stakeholders in order to arrive at supported solutions.

All these aspects of mobility are coordinated by the municipality of Zoersel in cooperation with relevant bodies at regional and Flemish level and the transport region. The aim is to provide safe, accessible and sustainable mobility that meets the needs of residents and contributes to the liveability of the municipality.

Challenges

The federal structure of Belgium necessitates coordination between federal, regional, and local governments, as well as the various transport regions. This complexity can lead to challenges in policy alignment and implementation.

Many people are accustomed to using cars for convenience, comfort, and speed. Changing this habit requires significant cultural and behavioral shifts. Car ownership is often seen as a status symbol, making it difficult to reduce reliance on private vehicles.

Existing infrastructure is predominantly car-oriented. Transitioning to pedestrian and cyclist-friendly infrastructure requires substantial investment and redesign. Urban sprawl and the layout of many cities and towns make walking and cycling less feasible due to long distances and unsafe conditions.

Pedestrians and cyclists often feel unsafe due to inadequate infrastructure and the risk of accidents with motor vehicles. Creating safe, dedicated lanes for cyclists and improving pedestrian pathways is crucial but challenging in densely populated areas.

Securing adequate funding for infrastructure projects, public transport, and sustainable mobility initiatives is a persistent challenge. Efficient allocation of resources between various modes of transport and infrastructure projects requires careful planning and prioritization. Public transport systems may be underfunded, infrequent, or unreliable, making them less attractive compared to private cars. Improving public transport requires substantial investment and coordinated planning across various levels of government. Furthermore, there is a need for implementing flexible solutions like De Lijn flexi-buses to cater to areas with less demand while maintaining efficiency. Ensuring the maintenance and development of both local roads and regional infrastructure in cooperation with higher levels of government is complex.

Space constraints and potential expropriations necessary to build appropriate infrastructure can cause significant delays or difficulties in construction. The cost of implementing new infrastructure and improving public transport is high. Securing funding and justifying these investments can be challenging. There might be economic resistance from industries related to car manufacturing and maintenance.

Implementing the STOP principle requires strong political will and consistent policy support over time. Policies favoring sustainable transport can be unpopular among car users, leading to political pushback. There is often a lack of awareness about the benefits of sustainable mobility and the availability of alternatives to car use. Educating the public and promoting a culture of sustainable transport is essential but takes time and effort.

Ensuring that sustainable transport options are accessible to all, including people with disabilities, the elderly, and those living in rural areas, is challenging. Infrastructure and services must be designed inclusively to cater to the needs of all community members. Coordinating between different modes of transport and ensuring seamless integration can be complex. Developing effective systems for shared mobility, such as bike-sharing and car-sharing, requires robust planning and technology integration. Each type of mobility often has its own system for reserving and paying, complicating the use of different systems in the same journey.

Overall, addressing these challenges involves a multifaceted approach, including infrastructure investment, policy support, public education, and collaboration between government, businesses, and communities.

Local assessment

KPIs (key performance indicators on the subject)

- *Number of times share bikes 'Donkey bikes' are used*
- *Number of times the two shared cars are used*
- *For own staff: the number of leasing contracts for bicycles (through the employer)*
- *Participation in the cycling exam*
- *Traffic measures for safety (speed bumps, measurement of speed, traffic signals, ...)*
- *Amount of bicycle-streets*

There is a mobility plan made by the municipality of Zoersel for Zoersel. The mobility service is implementing this mobility plan. Before implementing there's a neighborhood meeting to gather all the input of the residents. This input can be used to finalize the execution of the plan in their neighborhood.

Furthermore there's a lot of effort in the safe to school routes that were created. There are bicycle-streets, 'slow roads', a place to store your bicycle, ...

The amount of times the Donkey bikes are used can be monitored. Depending on this number, the necessity to provide more Donkey bikes or a public transport from one point to another can be made visual.

The amount of times the two shared cars are used, can be monitored. Depending on this number, the necessity of an extra shared car can be researched.

The amount of lease contracts for bicycles for the own staff, in combination with the number of times the staff use the bicycles to work, can be used to determine how sustainable the own staff is for their transportation for and to work.

The amount of children and schools that participate in the cycling exam, can represent the amount of children that learned about traffic safety, their own safety and the sustainable angle of cycling (and/or walking) to school. Furthermore this represents the safety of school routes. If it isn't safe, the children wouldn't take the bicycle.

The amount of speeding tickets at the end of the year and the location of these tickets, in combination with the implementation of the mobility plan, the counting of cars in specific streets, can give a good picture of which area's have a good traffic safety and which streets need extra measures.

The amount of bicycle streets represents that there are a lot of bicycles that use the street daily, and make the streets safer.

Suggested actions

Mobility plans

Developing integrated mobility plans for the entire municipality, divided into local community mobility plans, provides a strategic approach for future road development. Use the STOP principle as a guide for prioritizing actions. It is also important to launch public awareness campaigns, involving citizens in the draft stage and making the final results publicly known. This way of engaging stakeholders and communities will help avoid future frustration and misunderstandings regarding implementations. In addition to citizen involvement, it is crucial to have political will and support at all levels to address challenges on a larger scale.

Enhancing Sustainable Transport Systems

Incentivize sustainable transport by educating citizens, providing abundant options, and expanding pedestrian and cyclist infrastructure. This includes upgrading public transport, implementing traffic calming measures, creating safe routes for school children, enhancing public transport flexibility, expanding shared mobility systems, and creating more Hop-in points. Additionally, promote bike and car sharing.

Resource management

To reshape a safe traffic system within the boundaries of existing conditions, it is important to manage economic and spatial resources. First, secure adequate funding for roads and transportation. Additionally, optimize land use and streamline construction processes.

References

PAPERS:

Derkinderen SK (2020). Beleidsplan: Gemeentelijk mobiliteitsplan: december 2020. Gemeente Zoersel, 1-77.
Route2School (2019). Digitale schoolroutekaart: Gemeente Zoersel. R2S (route2school.be)

WEBSITES:

Netwerk duurzame mobliteit (2020). STOP-principe: Stappers, Trappers, Openbaar vervoer en Privé gemotoriseerd vervoer. STOP-principe: Stappers, Trappers, Openbaar vervoer en Privé gemotoriseerd vervoer | Netwerk Duurzame Mobiliteit (duurzame-mobiliteit.be)
Vlaanderen. Vervoersregio Antwerpen. Vervoerregio Antwerpen | Vlaanderen.be
Municipality of Zoersel. Mobiliteit en verkeer: elektrische deelfietsen. elektrische deelfietsen | gemeente & ocmw Zoersel
Muncipality of Zoersel. Mobiliteit en verkeer: elektrische deelwagens. elektrische deelwagens | gemeente & ocmw Zoersel
Municipality of Zoersel. Mobiliteit en verkeer: veilig fietsen: fietsuitleendienst velotheek op wielekes. fietsuitleendienst velotheek Op Wielekes | gemeente & ocmw Zoersel
Municipality of Zoersel. Mobiliteit en verkeer: veilig fietsen: fietsexamenroutes. fietsexamenroutes | gemeente & ocmw Zoersel
Municipality of Zoersel. Beeldbank: Foto's van gemeente Zoersel.
Vlaanderen. Federale overheidsdienst mobiliteit en vervoer. Federale Overheidsdienst Mobiliteit en Vervoer | Vlaanderen.be
Vlaanderen. Mobiliteit en openbare werken: Te voet, fiets, bromfiets en auto en motor. Mobiliteit en openbare werken | Vlaanderen.be
De Lijn. Beweeg mee naar minder CO2. Beweeg mee naar minder CO_2 - De Lijn
Donkey Republic. Hoe het werkt. Hoe het werkt » Eenvoudig te gebruiken deelfietsen » Donkey Republic
Kenis Share. Wat is het? Kenis Share
StatBel België in cijfers (2023). Evolutie van het wagenpark 2021-2023. Voertuigenpark | Statbel (fgov.be)

Further Reading

PAPERS:

Batty P., Palacin R. Gonzàlez-Gil A. (2015). Challenges and opportunities in developing urban modal shift. Travel Behaviour and Society, vol. 2, issue 2: 109-123.
Ma X., Yuan Y., Van Oort N., Hoogendoorn S. (2020). Bike-sharing systems' impact on modal shift: A case study in Delft, the Netherlands. Journal of Cleaner Production, vol. 259, 120846.
Cass N., Faulconbridge J. (2016). Commuting practices: New insights into modal shift from theories of social practice, vol. 45: 1-14.

Module 7

Sustainable energy and energetic neighbourhood renovation

Tim Chabot, Elise Goorden & Tine Vermeiren

Key-words

Energy
Energy-transition
Eustainability,
Neighbourhood approach

EU Green Deal

Supplying clean, affordable and

Targeted SDGs

#7, #8, #9, #10, #11, #13

Summary

This model gives an overview of the aspects of the energy-transition at play at community level. Local policy and citizen involvement is outlined.

Unit 1: European legislation

A summary of the European legislation concerning the energy-transition.

Unit 2: Sustainable energy use of municipal services

Municipal services provide for the community while leaving a carbon footprint. How do we ensure that energy transition is supported by citizens?

Unit 3: Setting up energy cooperative between citizens

An energy cooperative is an organisation that generates, sells and/or distributes energy in a sustainable and affordable way. Members of the cooperative are involved in producing and controlling the quality and cost of energy.

Unit 4: Energetic neighbourhood renovation

Energy district/neighbourhood renovation is the improvement of the energy usage of a district by modifying building structures, installations and systems. Building renovations as insulation (re)placement, windows or doors replacement or private renewable energy production are included.

Learning outcomes

- *Understanding European legislation on energy and the energy transition*
- *Recognizing the role of municipalities in setting an example for energy-efficient practices.*
- *Understand the role of local authorities in promoting energy cooperatives.*
- *Learn about energy cooperatives' structure and renewable energy goals.*
- *Recognize benefits of local citizen involvement in sustainable energy projects.*
- *Understand support for municipal sustainability and energy transition.*
- *Appreciate the expertise and flexibility of energy cooperatives.*
- *Identify economic benefits, including job creation and local investment.*
- *Understand community-driven development and local cooperation in energy transitions.*
- *Recognize the benefits of renewable energy communities and energy-efficient home renovations.*

Identify opportunities for community engagement in sustainable initiatives.

Introduction

The transition to sustainable energy is a critical priority for Europe, driven by the urgent need to combat climate change, reduce greenhouse gas emissions, and ensure energy security. This shift is underpinned by a robust framework of European legislation, including the European Green Deal, the Energy Performance of Buildings Directive (EPBD), and the European Renewable Energy Directive. These policies aim to create a sustainable, low-carbon economy by promoting energy efficiency, increasing the use of renewable energy sources, and fostering innovation in energy technologies.

The European Green Deal is the cornerstone of the EU's climate policy, setting ambitious targets to make Europe the first climate-neutral continent by 2050. It encompasses a wide range of initiatives aimed at reducing emissions, enhancing energy efficiency, and promoting sustainable practices across all sectors of the economy. The Green Deal also emphasises the importance of social equity, ensuring that the transition to a green economy benefits all citizens and leaves no one behind.

The Energy Performance of Buildings Directive (EPBD) is another key piece of legislation, focusing on improving the energy efficiency of buildings, which account for a significant portion of Europe's energy consumption and carbon emissions. The EPBD sets minimum energy performance standards for new and existing buildings, encourages the use of smart technologies, and promotes the renovation of the existing building stock to enhance energy efficiency. By improving the energy performance of buildings, the EPBD aims to reduce energy consumption, lower emissions, and create healthier living environments.

The European Renewable Energy Directive sets binding targets for the share of renewable energy in the EU's energy mix, aiming to increase the use of renewable sources such as wind, solar, and biomass. This directive supports the development of renewable energy projects, encourages investment in clean energy technologies, and promotes the integration of renewable energy into the grid. By increasing the share of renewables, the directive aims to reduce dependence on fossil fuels, enhance energy security, and contribute to the EU's climate goals.

Municipalities play a crucial role in the transition to sustainable energy, serving as examples of best practices and driving local initiatives. Sustainable energy use in municipal services includes measures such as improving the energy efficiency of public buildings, investing in renewable energy projects, and promoting sustainable transport options. By adopting these practices, municipalities can reduce their carbon footprint, lower energy costs, and inspire citizens to adopt sustainable behaviours.

One innovative approach to promoting sustainable energy at the local level is the establishment of energy cooperatives between citizens. These cooperatives enable communities to collectively invest in renewable energy projects, such as solar panels or wind turbines, and share the benefits. By pooling resources and working together, citizens can take an active role in the energy transition, reduce their energy costs, and support the development of local renewable energy projects.

Energetic neighbourhood renovation, or retrofitting at the community level, is another effective strategy for enhancing energy efficiency and sustainability. This approach involves upgrading the energy performance of entire neighbourhoods, including residential buildings, public spaces, and infrastructure. By implementing energy-efficient technologies, improving insulation, and integrating renewable energy sources, communities can significantly reduce their energy consumption and carbon emissions. Energetic neighbourhood renovation not only improves the quality of life for residents but also contributes to the broader goals of energy sustainability and climate resilience.

European legislation

Europe is at the forefront of global efforts to transition towards sustainable energy practices, driven by comprehensive legislative frameworks and ambitious targets. These initiatives are crucial in mitigating climate change, enhancing energy security, and fostering economic growth through innovation and green technologies.

One of the cornerstones of European energy policy is the European Climate Policy, which encompasses a range of initiatives aimed at reducing greenhouse gas emissions and promoting renewable energy sources. Central to this policy is the landmark Paris Climate Agreement, which commits signatory countries, including all EU member states, to limiting global temperature rise to well below 2 degrees Celsius above pre-industrial levels. In parallel, the EU Climate Policy for 2030 sets specific targets for emissions reductions and renewable energy deployment within the EU, ensuring alignment with international climate goals.

Complementing these efforts is the Energy Performance of Buildings Directive (EPBD), which mandates minimum energy performance standards for buildings across EU member states. Introduced to enhance energy efficiency in the building sector, the EPBD requires regular inspections of building energy performance and mandates that new buildings constructed from 2021 onwards achieve near-zero energy consumption levels. By improving the energy efficiency of buildings, the directive aims to reduce overall energy demand and decrease carbon emissions associated with heating, cooling, and lighting.

The European Renewable Energy Directive further bolsters the EU's commitment to sustainability by setting binding targets for the share of renewable energy in the total energy consumption of member states. This directive aims to accelerate the development and deployment of renewable energy sources such as wind, solar, biomass, and hydroelectric power. By diversifying the energy mix and reducing dependence on fossil fuels, the directive contributes to energy security and enhances the resilience of Europe's energy infrastructure.

Additionally, the Green Deal represents a comprehensive legislative framework that aims to transform Europe into a climate-neutral continent by 2050. At its core, these are ambitious targets for 2030, including a minimum 55% reduction in greenhouse gas emissions compared to 1990 levels and a mandatory target of 32% renewable energy in the overall energy mix. The Green Deal emphasises the crucial role of energy efficiency in achieving sustainability goals, promoting a "renovation wave" to improve the energy performance of buildings and reduce CO2 emissions. Moreover, it prioritises investments in sustainable energy infrastructure such as smart grids and energy storage systems, essential for integrating intermittent renewable energy sources into the grid effectively.

Furthermore, the Green Deal includes provisions for a Just Transition Fund, designed to support regions and communities heavily reliant on fossil fuels in their transition to a low-carbon economy. This initiative aims to mitigate the social and economic impacts of decarbonization by providing financial assistance for reskilling workers, supporting local businesses, and investing in sustainable development projects.

In conclusion, Europe's legislative frameworks for energy and sustainability reflect a holistic approach to addressing climate change, enhancing energy efficiency, and promoting renewable energy sources. These initiatives not only aim to meet international climate commitments but also stimulate innovation, create jobs, and improve the quality of life for European citizens. By setting ambitious targets and implementing supportive policies, Europe is paving the way towards a sustainable energy future, demonstrating global leadership in the fight against climate change.

State of the art

Sustainable Energy Use in Municipal Services

Municipalities play a pivotal role in promoting sustainable energy practices within their communities. By leading by example, municipalities can inspire citizens to undertake energy-efficient renovations and adopt green energy solutions. This proactive approach is crucial for demonstrating the feasibility and benefits of sustainability initiatives, thereby encouraging widespread local participation.

Leadership and Inspiration

Ensuring local participation in energy-efficient practices hinges on the municipality setting a precedent. Municipalities are uniquely positioned to exemplify energy-efficient practices, thereby motivating residents to follow suit. For instance, the municipality of Zoersel's commitment to the Local Energy and Climate Action Plan (LEKP) and the Covenant of Mayors (BC 2030) showcases a robust framework for local climate and energy policies. Initiatives like widespread LED adoption of streetlights and reduced energy consumption in municipal facilities serve as tangible examples of sustainability in action.

Tailoring Approaches to Local Conditions

Municipalities must consider local conditions such as space availability, natural resources, and budgetary constraints when selecting green energy sources. Often, a balanced mix of energy sources proves most effective for achieving sustainable energy goals. This tailored approach ensures that the chosen energy solutions are not only environmentally friendly but also economically viable.

Benefits of Leading by Example

1. **Leadership and Inspiration**: *Demonstrating a commitment to energy efficiency and sustainability motivates residents to adopt similar practices.*
2. **Building Trust**: *Taking concrete steps toward sustainability earns residents' trust and fosters engagement in municipal initiatives.*
3. **Cost Savings**: *Enhancing energy efficiency in municipal buildings reduces long-term energy costs, freeing up funds for other projects.*
4. **Climate impact reduction**: *Lowering energy consumption in municipal buildings curbs CO2 emissions, contributing to environmental goals, resulting in clean air and reducing the municipality's carbon footprint.*

Setting Up Energy Cooperatives Between Citizens

Energy cooperatives represent a powerful tool for community-driven renewable energy projects. By collaborating with energy cooperatives, local municipalities can facilitate community involvement, enhance sustainability, and stimulate the local economy. An energy cooperative is a group of people within a community who come together to jointly develop, finance, and manage sustainable energy projects. They aim to promote renewable energy, operate democratically, and often have local community goals.

Advantages of Partnering with Energy Cooperatives

1. **Local Involvement:** *Energy cooperatives are often established by citizens from the local community. By cooperating with them, the municipality actively involves citizens in the development of sustainable energy projects. This increases local involvement and support for these initiatives.*

2. **Support for Sustainability:** *By working with energy cooperatives, local municipalities can involve their residents in sustainable initiatives and the energy transition. This helps to raise awareness about sustainability and contributes to a positive attitude towards green energy.*

3. **Knowledge and Expertise**: *Energy cooperatives often bring a wealth of knowledge and expertise on sustainable energy projects. By cooperating with them, local municipalities can benefit from this knowledge and experience when developing and implementing energy projects.*

4. **Flexibility and Customization**: *Energy cooperatives are often flexible and can offer customised solutions tailored to the specific needs and capabilities of the local municipality. This enables energy projects to be implemented efficiently and effectively.*

5. **Economic Stimulus**: *Promoting local energy cooperatives can boost the local economy by creating jobs and promoting local investment in renewable energy projects.*

Case Study: Local Authorities in Flanders

Local authorities in Flanders often encourage the creation of energy cooperatives as part of their sustainable development and climate action policies. This can lead to collaborations, support, and facilities for energy cooperatives. By cooperating with energy cooperatives, local municipalities can strengthen their sustainability goals, increase local involvement, benefit from expertise and flexibility, and contribute to the local economy. Zoersel gained a solar installation by means of energy cooperative Zonnewind on the roof of city Hall. This way the administrative services run on locally produced renewable energy, without the need for a substantial investment from the municipality.

City Hall of Zoersel with installation of new solar panel installation by Zonnewind. (Source: Zonnepanelen op dak van administratief centrum Zoersel - Zonnewind)

Energetic Neighbourhood Renovation

Energetic neighbourhood renovation is a comprehensive approach to retrofitting existing residential areas to enhance energy efficiency and integrate renewable energy sources. This bottom-up approach fosters community involvement, cooperation, and empowerment, creating resilient neighbourhoods where residents shape their living environment.

To ensure widespread participation in home renovations, neighbourhood collaboration is key. By partnering with local residents, municipalities can catalyse a true energy transition within neighbourhoods. This approach not only enhances energy efficiency but also fosters a sense of community and shared responsibility.

Case Study: Bloemenwijk in Zoersel

ZOERSEL

DOE MEE MET
DE WIJKRENOVATIE 'BLOEMENWIJK'

wijk van de toekomst

project logo

In partnership with non-profit organisation Klimaatwerf and local residents, the municipality of Zoersel aims to catalyse a true energy transition in the "Bloemenwijk", a typical suburban neighbourhood with mostly freestanding houses dating from the seventies. The goal is to help families shift from fossil fuels to sustainable energy sources through local projects. These initiatives aim to transform Bloemenwijk into a renewable energy community where residents, businesses, and the municipality invest in and share green energy production.

Presentation of project "Bloemenwijk" in 2023 for the people of the neighbourhood. (Source: press release Zoersel 20/04/2023 PERSBERICHT ZOERSEL: Zoersel start met energetische wijkrenovatie in Bloemenwijk (flxml.eu))

Project team "Bloemenwijk" (Source: press release Antwerp province april 2023 PERSBERICHT ZOERSEL: Zoersel start met energetische wijkrenovatie in Bloemenwijk (flxml.eu))

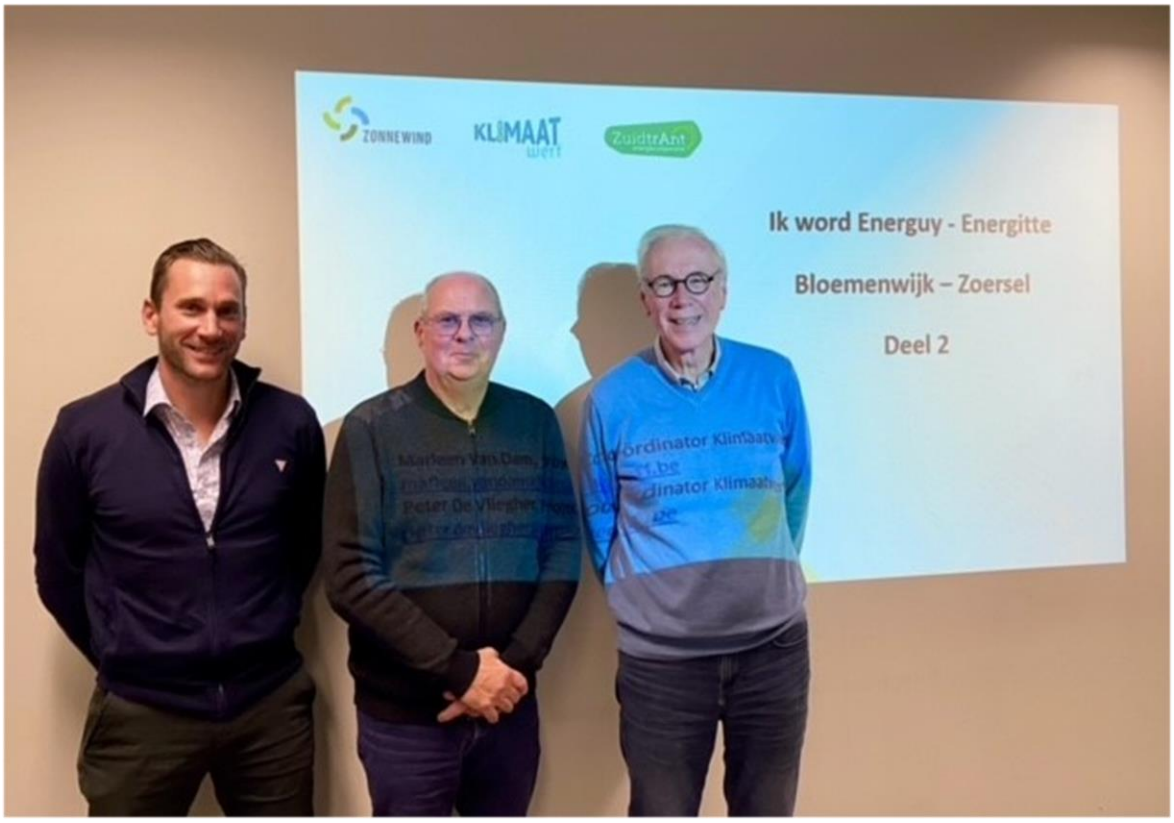
Initiatives and Benefits

1

Home Renovations: *Homeowners in Bloemenwijk can participate by energetically renovating their homes, generating green electricity, or joining collective projects like solar installations and neighbourhood energy sharing. Energy renovation, including insulation and CO2-neutral heating, enhances home value, lowers energy bills, and supports climate action. For these improvements the homeowners can expect help from the expert from Klimaatwerf to guide them through the different processes and even help in selecting the right contractor.*

2

Neighbour Helpers: *The initiative recruits 'neighbour helpers'—dubbed 'EnerGuy' and 'EnerGitte'—from Bloemenwijk who can assist neighbours with energy questions and renovation guidance. Trained volunteers offer practical advice to all residents, whether homeowners or tenants, helping them save energy and navigate home improvements.*



Energuys (Source: Internal source Zoersel)

3

Climate table discussions: *Residents of the Bloemenwijk can come to table discussion moments organised by the municipality and Klimaatwerf to discuss the different projects in their neighbourhood, ask questions and provide the municipality with feedback and input about the project and challenges in their community.*

The Broader Impact

Energetic neighbourhood renovation not only benefits individual homeowners but also contributes to broader environmental goals. By reducing energy consumption and promoting renewable energy, these initiatives help municipalities meet their climate targets. Additionally, the collaborative nature of these projects strengthens community ties and enhances social cohesion.

Challenges

The pursuit of green and clean energy has evolved significantly, with municipalities playing a crucial role in implementing sustainable practices. While significant progress has been made, municipalities face several challenges in implementing these sustainable practices. The current state of the art in this domain focuses on three key areas: sustainable energy use of municipal services, energy cooperatives, and energetic neighbourhood renovations.

Sustainable Energy Use of Municipal Services

Municipalities worldwide are transitioning to sustainable energy practices to reduce their carbon footprint and energy costs. This includes the adoption of renewable energy sources such as solar, wind, and geothermal for powering public buildings, street lighting, and water treatment facilities. For instance, many cities have installed solar panels on rooftops of government buildings and schools, leading to significant reductions in energy consumption and greenhouse gas emissions.

Advanced energy management systems are being deployed to monitor and optimise energy use in real-time. Smart grids and energy storage solutions enhance the reliability and efficiency of energy supply. Municipalities are also investing in electrification of public transportation, including electric buses and charging infrastructure, contributing to cleaner urban mobility.

Energy Cooperatives

Energy cooperatives are emerging as powerful tools for community-driven renewable energy projects. These cooperatives enable residents to collectively invest in and benefit from local renewable energy installations such as solar farms and wind turbines. By pooling resources, members can achieve economies of scale, making clean energy more affordable and accessible.

The cooperative model promotes local ownership and control over energy resources, fostering greater community engagement and resilience. Successful examples include the Danish Samsø Island, which became energy self-sufficient through wind and biomass cooperatives, and Germany's Schönau, where residents took over the local grid to promote green energy.

Energetic Neighborhood Renovations

Energetic neighbourhood renovations aim to retrofit existing residential areas to enhance energy efficiency and integrate renewable energy sources. This comprehensive approach includes upgrading building insulation, installing energy-efficient windows and heating systems, and incorporating renewable energy technologies such as solar panels and heat pumps.

Programs like the European Union's "Renovation Wave" initiative provide funding and technical support for large-scale renovations, targeting a significant reduction in energy consumption and carbon emissions. In the Netherlands, the "Energiesprong" initiative has pioneered the concept of net-zero energy homes through prefabricated retrofit solutions, significantly reducing renovation time and costs.

These renovations not only lower energy bills for residents but also improve indoor comfort and health. Additionally, they create local jobs and stimulate the economy, providing a holistic benefit to the community.

Implementing sustainable energy practices and energetic neighbourhood renovations presents several challenges. Funding remains a critical barrier, as upfront costs for renewable energy projects and retrofits can be high. However, innovative financing mechanisms such as green bonds, public-private partnerships, and government grants are increasingly being utilised to overcome this hurdle.

There is also a lack of knowledge among neighbourhood residents and municipal workforce. This combined with external pressure to take action can result in "eco-anxiety". Technical expertise and capacity building are essential for successful implementation. Municipalities need to invest in training and development to ensure their workforce can effectively manage and maintain new technologies. Public awareness campaigns and educational programs are vital to garner support and participation from the community.

Local assessment

To effectively monitor and evaluate the municipality's progress in consuming clean, green energy, it is crucial to establish Key Performance Indicators (KPIs). These KPIs should be specific, measurable, attainable, relevant, and time-bound (SMART), providing a robust framework for assessing various aspects of energy consumption and sustainability efforts. Herein, we propose a set of KPIs tailored to monitor energy consumption, environmental impact, financial metrics, community engagement, technology, and infrastructure.

Energy Consumption and Efficiency

Percentage of Energy from Renewable Sources *This KPI measures the proportion of total energy consumption derived from renewable sources such as solar, wind, and geothermal energy. It is calculated as follows: (Renewable Energy Consumption / Total Energy Consumption) * 100. Targeting an annual increase in this percentage will indicate the municipality's shift towards cleaner energy sources.*

Total Energy Consumption Reduction *This indicator assesses the total reduction in energy consumption compared to a baseline year. The calculation is: Baseline Year Energy Consumption - Current Year Energy Consumption. Setting specific annual reduction targets helps track improvements in energy efficiency.*

Energy Efficiency Improvement in Municipal Buildings *This KPI measures energy use per square meter in municipal buildings, calculated as: Total Energy Consumption of Municipal Buildings / Total Square Meters of Municipal Buildings. Achieving annual reductions in energy use per square meter reflects progress in improving energy efficiency.*

Environmental Impact

Reduction in CO2 Emissions. *This KPI quantifies the decrease in CO2 emissions resulting from municipal energy consumption, calculated by: Baseline Year CO2 Emissions - Current Year CO2 Emissions. Annual reduction targets will demonstrate the municipality's contribution to mitigating climate change.*

Greenhouse Gas (GHG) Emissions Intensity. *This measures GHG emissions per unit of energy consumed, calculated as: Total GHG Emissions / Total Energy Consumption. Reducing GHG emissions intensity annually signifies a cleaner energy mix and improved sustainability practices.*

Financial Metrics

Cost Savings from Energy Efficiency Measures *This KPI captures the financial benefits of energy efficiency improvements, calculated as: Energy Costs Before Efficiency Measures - Energy Costs After Efficiency Measures. Tracking cost savings provides a clear picture of the economic impact of sustainability initiatives.*

Return on Investment (ROI) for Renewable Energy Projects *This indicator measures the financial return on investment for renewable energy projects, calculated by: (Net Profit from Renewable Energy Projects / Total Investment in Renewable Energy Projects) * 100. Ensuring a positive ROI within a specified timeframe highlights the financial viability of renewable energy investments.*

Community Engagement and Participation

Percentage of Households Participating in Energy Programs *This KPI measures the proportion of households participating in energy efficiency or renewable energy programs, calculated as: (Number of Participating Households / Total Number of Households) * 100. Increasing participation rates annually indicates growing community involvement.*

Number of Energy Cooperatives Formed *This KPI tracks the number of energy cooperatives established within the municipality. By fostering the creation of new cooperatives annually, the municipality can enhance local engagement and investment in renewable energy projects.*

Number of people invited to climate climate table discussions *This KPI tracks the number of people who were invited to climate table discussions.*

Technology and Infrastructure

Number of Public EV Charging Stations Installed *This indicator measures the total number of electric vehicle (EV) charging stations installed in public areas, providing a clear metric for the municipality's support for sustainable transportation.*

Installed Capacity of Renewable Energy (MW) *This KPI tracks the total installed capacity of renewable energy sources, such as solar and wind, within the municipality. Increasing installed capacity annually reflects progress in expanding renewable energy infrastructure.*

Monitoring and Reporting

Frequency of Energy Audits Conducted *Regular energy audits in municipal buildings and facilities are crucial for identifying efficiency improvements. Conducting these audits annually or biannually ensures ongoing assessment and optimization.*

Public Reporting and Transparency *This KPI measures the regularity and transparency of energy consumption and sustainability reports. Ensuring timely and transparent reporting, such as quarterly or annually, fosters accountability and public trust.*

Suggested actions

Know the Energy You Are Using as a Local Municipality

Understanding the energy consumption patterns of a municipality is the foundational step toward reducing reliance on fossil fuels and improving energy efficiency. Municipalities must conduct comprehensive energy audits to assess the current state of energy usage across all municipal facilities, including administrative buildings, public schools, street lighting, water treatment plants, and public transportation systems. These audits should identify the primary sources of energy consumption and the proportion derived from fossil fuels versus renewable sources. Additionally, municipalities should implement advanced energy monitoring systems to collect real-time data, facilitating continuous monitoring and management of energy usage. This data-driven approach will enable municipalities to identify inefficiencies, set benchmarks, and track progress over time.

Make a Plan to Decarbonize and Reduce Your Own Energy Consumption

Developing a strategic plan to decarbonize municipal operations is essential for setting a strong example for citizens. The decarbonization plan should outline clear, measurable goals for reducing greenhouse gas emissions and increasing energy efficiency. Key initiatives might include retrofitting municipal buildings with energy-efficient technologies, such as LED lighting, high-performance insulation, and energy-efficient HVAC systems. Additionally, municipalities should invest in renewable energy installations, such as solar panels on municipal buildings and wind turbines on municipal land. Electrification of public transportation, including the deployment of electric buses and the installation of charging infrastructure, further reduces reliance on fossil fuels. Incorporating these initiatives into a cohesive, actionable plan with specified timelines and milestones ensures systematic progress towards decarbonization.

Create an Energy Community with Local Actors and the Municipality

Forming an energy community involves collaboration between the municipality, local businesses, and residents to develop and manage sustainable energy projects. Municipalities can facilitate the creation of energy cooperatives where members collectively invest in and benefit from local renewable energy projects, such as solar farms or wind turbines. These cooperatives operate democratically, with profits reinvested into the community. The municipality can provide initial support by offering technical expertise, financial incentives, and access to municipal land for renewable energy projects. Partnerships with local educational institutions and businesses can enhance the technical and financial capabilities of the energy community, fostering innovation and resilience. By integrating various local actors, energy communities can leverage diverse resources and knowledge to effectively manage energy transitions.

Improve Your Support Base Amongst Local Residents for Home Renovations

Encouraging residents to undertake home renovations aimed at energy efficiency requires a robust support system and community engagement strategies. Municipalities should launch awareness campaigns to educate residents on the benefits of energy-efficient renovations, such as reduced energy bills, increased home comfort, and lower carbon footprints. Providing financial incentives, such as grants, low-interest loans, and tax rebates, can alleviate the upfront costs of renovations.

Establishing a network of 'energy ambassadors'—trained local volunteers who offer advice and support to homeowners—can facilitate peer-to-peer learning and enhance trust. Municipalities should also create partnerships with local contractors and suppliers to offer discounted services and materials for energy-efficient renovations. Additionally, hosting workshops, webinars, and community events focused on sustainable living and energy efficiency can foster a culture of sustainability and encourage broader participation.

Transitioning to clean energy and reducing reliance on fossil fuels requires a comprehensive and collaborative approach. By understanding current energy use, developing strategic decarbonization plans, creating energy communities, and engaging local residents in energy-efficient home renovations, municipalities can lead the way in fostering sustainable and resilient communities. These initiatives not only contribute to environmental goals but also promote economic growth, enhance public health, and improve the overall quality of life for residents. Through systematic planning, community collaboration, and ongoing support, municipalities can effectively drive the energy transition and achieve their climate goals.

References

Gemeente Zoersel, IGEAN, BC 2030 (2020). Klimaatactieplan 2030. Gemeente Zoersel: 1-122.

WEBSITES:

European Union. Summaries of EU legislation. Energy, environment and climate change. Summaries of EU legislation - EUR-Lex (europa.eu).

European Commission. European Climate Law. European Climate Law - European Commission (europa.eu).

European Commission. Questions and Answers on the revised Energy performance of Buildings Directive (EPBD). Revised Energy Performance of Buildings Directive (EPBD) (europa.eu).

European Commission. Renewable Energy Directive. Renewable Energy Directive (europa.eu).

European Commission. The European Green Deal. The European Green Deal - European Commission (europa.eu).

European Commission. Just Transition Fund. Just Transition Fund - European Commission (europa.eu).

Gemeente Zoersel. Klimaatactieplan. klimaatactieplan | gemeente & ocmw Zoersel.

Klimaatwerf VZW. Jouw werfleider voor een duurzame toekomst. Start - Klimaatwerf - Jouw werfleider voor een duurzame toekomst.

Zonnewind. Samen energie besparen en groene energie opwekken in de Voorkempen. Zonnewind,, jouw energiecoöperatie.

Gemeente Zoersel. Energetische wijkrenovatie 'Bloemenwijk'. energetische wijkrenovatie 'Bloemenwijk' | gemeente & ocmw Zoersel.

REScoop.eu. REScoop.eu is the European federation of citizen energy cooperatives. REScoop.

Vlaanderen. Het Lokaal Energie- en Klimaatpact (LEKP). Het Lokaal Energie- en Klimaatpact (LEKP) | Lokaal Energie en Klimaat Pact (lokaalklimaatpact.be).

Vlaanderen. Burgemeestersconvenant (BC2030). Burgemeestersconvenant | Vlaanderen.be.

Further Reading

Gemeente Zoersel. Klimaatactieplan. klimaatactieplan | gemeente & ocmw Zoersel.

Gemeente Zoersel. Energetische wijkrenovatie 'Bloemenwijk'. energetische wijkrenovatie 'Bloemenwijk' | gemeente & ocmw Zoersel.

European Commission. The European Green Deal. The European Green Deal - European Commission (europa.eu).

Klimaatwerf VZW. Jouw werfleider voor een duurzame toekomst. Start - Klimaatwerf - Jouw werfleider voor een duurzame toekomst.

Zonnewind. Samen energie besparen en groene energie opwekken in de Voorkempen. Zonnewind,, jouw energiecoöperatie.

Module 8

Sustainable Water Management

Lawrence Sudlow and Ignacio Garcia

Key-words

Collection
Treatment and Responsible Use of Water

Targeted SDGs

#1, #3, #6, #11, #12, #13, #14, #15

EU Green Deal

Water Framework Directive, Bathing Water Directive, Biodiversity strategy for 2030, Zero Pollution Action Plan, From Farm To Fork, The common agricultural policy: 2023-27, A Blueprint to Safeguard Europe's Water Resources, EU Drinking Water Directive, EU Urban Wastewater Treatment Directive, EU Nitrates Directive, EU Floods Directive, EU Marine Strategy Framework Directive

Summary

This learning module is designed to show how EU legislation and many EU directives are connected to good water management. Local authorities need to address water management in public green areas and parks; technical solutions for saving water in public buildings; optimization/modernization of the water supply chain; ecological solutions in water treatment and play a part in educating citizens about the responsible use of water.

Unit 1 **Water collection**.

The responsibility to collect water is often a national or regional criteria but local authorities can also get involved.

Unit 2 **Water treatment**.

All local authorities need to comply with national or regional legislation even though the work is quite often contracted by the greater authority to encompass a number of municipalities. The local authority should monitor and control the affluent from rainwater and sewage from buildings.

Unit 3 **Responsible use of water**.

From the use of river water, tap water and even "grey" water, the local authority should play a major part in education and enforcing the correct and most efficient use of water.

Learning outcomes

By the end of this module, the trainees should be able to

- *Understand how EU legislation impacts on the management of water*
- *Have a vision of what the Green Deal aims to achieve in terms of water*
- *Recognise their responsibilities when it comes to water management*

Module content

Introduction

Water is life. It is a precondition for human, animal and plant life as well as an indispensable resource for the economy. Water also plays a fundamental role in the climate regulation cycle. Protection of water resources, of fresh and saltwater ecosystems and of the water we drink and bathe in is, therefore, one of the cornerstones of environmental protection.

The stakes are high, the issues transcend national boundaries, and concerted action at the level of the local municipalities is necessary to ensure effective protection.

The European Green Deal presents a roadmap for making the EU's economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all. The European Green Deal aims to boost the efficient use of resources by moving to a clean, circular economy and stop climate change, revert biodiversity loss and cut pollution.

The European Green Deal outlines investments needed and financing tools available, and explains how to ensure a just and inclusive transition. The European Green Deal covers all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles and chemicals.

There is a lot of EU legislation and many EU directives that are designed to ensure sustainable water management throughout the European Union. As diverse as the EU is, there are common goals that all member states should drive towards and local authorities are obliged to adhere to and comply with European law as well as their own national and regional obligations. Local authorities should aim to implement European directives even before national and regional legislation transposes those elements, going beyond the mere fulfilment of the requirements.

State of the art

The EU's Biodiversity Strategy for 2030 is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. The strategy aims to put Europe's biodiversity on a path to recovery by 2030, and contains specific actions and commitments. At least 25,000km of European rivers will be restored to a free-flowing state by 2030. The strategy also highlights the role of freshwater protections in stemming biodiversity loss and mitigating climate change, for example through the restoration of wetlands.

Pollution harms our health and our environment. It is the largest environmental cause of multiple mental and physical diseases and of premature deaths, especially among children, people with certain medical conditions and the elderly. In addition to affecting people's health, pollution is one of the main reasons for the loss of biodiversity. It reduces the ability of ecosystems to provide services such as carbon sequestration and decontamination.

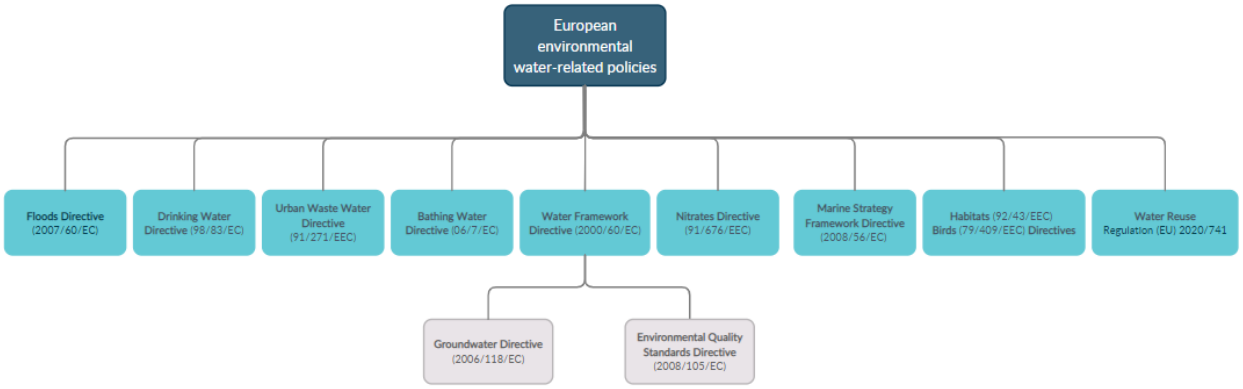
The zero pollution vision (the Zero Pollution Action Plan) for 2050 is for air, water and soil pollution to be reduced to levels no longer considered harmful to health and natural ecosystems, that respect the boundaries with which our planet can cope, thereby creating a toxic-free environment. This has been turned into key 2030 targets in order to speed up reducing pollution at source. These include: improving water quality by reducing waste, plastic litter at sea (by 50%) and microplastics released into the environment (by 30%)

The Farm to Fork Strategy is at the heart of the European Green Deal. It addresses comprehensively the challenges of sustainable food systems and recognises the inextricable links between healthy people, healthy societies and a healthy planet. There is an urgent need to reduce dependency on pesticides and antimicrobials, reduce excess fertilisation, increase organic farming, improve animal welfare, and reverse biodiversity loss.

The EU Common Agricultural Policy helps to protect the essential role that water plays for food, farming, and the environment. Clean and plentiful water is an essential natural resource for society, providing the basis for human health and quality of life. In order to protect this resource, the Common Agricultural Policy encourages farmers to use their water supply in a safe and sustainable way.

The EU has in place a number of other policies that relate to water:

- **Floods Directive** *(2007/60/EC)*
- **Drinking Water Directive** *(98/83/EC)*
- **Urban Waste Water Directive** *(91/271/EEC)*
- **Bathing Water Directive** *(06/7/EC)*
- **Nitrates Directive** *(91/676/EEC)*
- **Marine Strategy Framework Directive** *(2008/56/EC)*
- **Habitats** *(92/43/EEC)* **Birds** *(79/409/EEC)* **Directives**
- **Water Reuse Regulation** *(2020/741 EU)*
- **Groundwater Directive** *(2006/118/EC)*
- **Environmental Quality Standards Directive** *(2008/105/EC)*



These all contribute to the EU Water Framework Directive (2000/60/EC)

"Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such." That statement is the opening line of the Water Framework Directive. It is a guiding principle for local authorities and underpins the value of water.

The EU Water Framework Directive is a legal framework to protect and restore clean water in the EU. It Includes agriculture management, overall land use planning, forest resources utilisation. It also includes protection of coastal zones and marine environments from land-based activities. It looks to use water more efficiently, integrate water management goals into physical, social and economic planning, and ensure its long-term sustainable use.

Implementation of the Water Framework Directive is essential if the objectives are to be met within the given timeframe. The responsibility for the correct implementation of the directive is down to municipalities and regional authorities, although the member states also have to incorporate the elements of the directive in their national legislation.

The Water Framework Directive has been a pioneering piece of legislation because it mandates public participation, recognising the value of local knowledge and community involvement in decision making processes. The Water Framework Directive is implemented through River Basin Management Plans in three six-year cycles. Each cycle provides an opportunity to assess water conditions at different stages and set out actions to achieve water quality objectives.

Water collection and water treatment

The supply of drinking water and the collection and treatment of waste water go under the definition of 'water services' in all European countries. Whatever the governance model chosen by a country or region, responsibilities and information flows must be clearly defined: this proves instrumental to good governance, which in itself is a prerequisite for sustainable and high-quality water services. Water services are defined in Article 2 (38) of the Water Framework Directive. Four management models may be identified across Europe:

- **Direct public management**: *responsible public entity - in charge of service provision and their management.*
- **Delegated public management**: *management entity is appointed by the responsible public entity to execute the management tasks. Management entities usually remain the ownership of the public sector, although in the EU, in some cases, there is the possibility of a minor private shareholding.*
- **Delegated private management**: *responsible public entity - appoints a private company to manage tasks, on the basis of a time-bound contract in the form of lease or concession contract. The ownership of the infrastructure remains in the hands of public authorities.*
- **Direct private management:** *all management tasks, responsibilities and ownership of water utilities are placed in the hands of private operators, while public entities - control and regulation.*

In the majority of countries there is a mix of the first three models. The trend is towards public and private delegated management. Public authorities are in charge of approving the tariffs, determining the quality of service as well as setting and enforcing the environmental and health standards. Water tariffs contribute to recovering the costs almost everywhere in Europe: in some countries costs are still to be covered by a mix of tariffs, transfers and taxes (3Ts).

The tariff structure differs from country to country, but in the majority of cases, the tariff is made up of a fixed component and a volumetric component. A tendency to set the 'tariff structure' at national level may be observed, while price setting still takes place at local level.

As mentioned previously, the Water Framework Directive *is implemented through* River Basin Management Plans*. Put another way, the management of water is by catchment areas, defined across the whole of the continent. A catchment is an area of the landscape that catches and collects rainfall and allows it to flow through rivers, lakes and groundwater to the sea. The characteristics and health of water within that catchment reflect both the natural attributes and the human activities within that area. To effectively manage the quality of water in our rivers, lakes and coastal areas we need to look back up along the catchment and understand what happens to water as it makes its journey towards the sea.*

The Water Framework Directive *requires EU Member States to present and manage* River Basin Management Plans*. These include the* River Basin Districts *and their sub-units, the surface water bodies (water body category, ecological status or potential and chemical status), the groundwater bodies (aquifer type, quantitative status and chemical status) and the monitoring of sites.*

Water does not stop at administrative or political boundaries, so the best way to protect and manage water is by close international co-operation between all the countries within the natural hydrological unit of the river basin – bringing together all interests upstream and downstream.

The Water Framework Directive establishes a legal framework to protect and enhance the status of aquatic ecosystems; prevent their deterioration and ensure long-term, sustainable use of water resources. It also provides for an innovative approach for water management based on river basins, the natural geographical and hydrological units, and sets specific deadlines for EU Member States.

In April 2024 a new Urban Wastewater Treatment Directive was approved by the European Parliament. After more than 30 years, this new legislation aims to adapt wastewater management in Europe to the current challenges.

The revised EU water management and urban wastewater treatment standards are designed to better protect public health and the environment. Before becoming EU law, the deal will need to be approved by Member States in the Council. Member States will have 30 months to transpose the recast Directive into their national legislation. The main elements in this new legislation include that by 2035, urban wastewater will undergo secondary treatment (i.e., the removal of biodegradable organic matter) before it is discharged into the environment, in all agglomerations of the size of 1,000 population equivalent (p.e., standard measuring unit describing the average pollution released by one person per day) or more. By 2039, tertiary treatment (i.e. the removal of nitrogen and phosphorus) will be applied in all wastewater treatment plants covering 150,000 p.e. and above, and by 2045 in those covering 10.000 p.e. and above. An additional treatment removing a broad spectrum of micro-pollutants ('quaternary treatment') will be mandatory for all plants over 150,000 p.e. (and over 10,000 p.e. based on a risk assessment) by 2045.

The monitoring of various public health parameters (such as known viruses and emerging pathogens), chemical pollutants, including so-called "forever chemicals" (per- and polyfluoroalkyl substances or PFAS), microplastics and antimicrobial resistance will be strictly monitored.

The law introduces extended producer responsibility (EPR) for medicinal products for human use and cosmetic products, to cover the costs of quaternary treatment (to remove micro-pollutants from urban wastewater). At least 80% of the costs will be covered by producers, complemented by national financing.

EU countries will be required to promote the reuse of treated wastewater from all urban wastewater treatment plants where appropriate, especially in water-stressed areas.

Challenges

The challenges to water management at a local level are increasingly complicated but the EU legislation contained within the European Green Deal should indicate the measures needed to be taken to ensure the sustainable use of water. This legislation is being constantly updated, like the Urban Wastewater Treatment Directive that should be passed by the European Commission and transposed into national legislation by 2028 at the latest.

Regional and local authorities do not need to wait for national legislation to "catch up" with the EU vision and should work towards achieving the goals described. Looking after and using water sensibly is essential for the well-being of everyone.

Further reading and investigation into the implementation of the EU directives is to be encouraged. There are many references online to European municipalities that have taken substantial action to comply with EU legislation and even gone beyond the required steps to achieve the objectives contained in the European Green Deal.

It should also be noted that grants are available through national agencies for regional and local authorities to use in order to develop projects and programmes that help to improve water management at all levels.

Local Assessment

The European Environment Agency is preparing its major State of Water Assessment for publication later in 2024, which will provide a comprehensive picture of the status of surface and groundwaters. Their quality and quantity remain under significant pressures and their status is being made worse by the changing climate.

Local authorities should be aware that there are ample possibilities for improving water management to achieve the objectives of the Water Framework Directive through the stringent and well-integrated implementation of existing legislation and the introduction of supplementary measures that reduce the pressures that cause failure to achieve good status. A range of pollutants in many of Europe's waters threaten aquatic ecosystems and may lead to public health concerns. Reducing pollution is the first step to achieving improved water quality. This applies as much to fresh water as waste water and marine areas.

Agricultural production is a major source of diffuse pollution, mostly as a result of excessive emissions of nutrients and chemicals such as pesticides. Other drivers include rural dwellings, run-off from urban areas and forestry. Member States currently use a large number of measures, including farm-level nutrient planning, fertiliser standards, appropriate tillage, nitrogen fixing and catch crops, buffer strips and crop rotation.

The contamination of European waters with hazardous substances is a major environmental concern. Reducing hazardous substances in water requires not only the strong implementation of current legislation, but also the adoption of more sustainable ways to produce and use chemicals, both in Europe and beyond.

Improved efforts to reduce these chemicals in wastewater treatment plants by improving wastewater treatment should go hand in hand with clear efforts to reduce them at source by raising consumer awareness and adjusting consumption, as well as through longer term initiatives, such as those aiming to create a non-toxic environment and a circular economy.

Restoring aquatic ecosystems through, for example, 'making room for the river', river restoration or floodplain rehabilitation, 'coastal zone restoration projects' and integrated coastal zone management has multiple benefits. The restoration of cleaner, healthier and sustainable river conditions includes:

- *employing measures related to river continuity, such as removing obstacles and installing fish passes;*
- *employing measures focused on restoring aquatic habitats, such as improving physical habitats;*
- *managing sediment in a way that ensures that it is transported along the length of rivers;*
- *reconnecting backwaters and wetlands to restore lateral connectivity between the main river channel, the riparian area and the wider floodplain;*
- *implementing natural water retention measures that restore natural water storage, for example inundating flood plains and constructing retention basins;*
- *restoring the natural water flow regime through, for example, setting minimum flow and ecological flow requirements;*
- *developing master or conservation plans for restoring the population of threatened fish species.*

The State of Water Assessment, and in particular the assessment of pressures and impacts, reveals that activities in sectoral areas such as agriculture, energy and transport are the driving forces behind the achievement, or non-achievement, of good status. Local authorities should conduct their own water management status to identify shortcomings and set good status objectives defining the boundaries of sustainability. Managing water in a green economy means using water in a sustainable way in all sectors and ensuring that ecosystems have both the quantity and the quality of water they need to function. It also means fostering a more integrated and ecosystem-based approach that involves all relevant economic sectors. This integration throughout the river basin can be enhanced by, for example, better cooperation between competent authorities, and increased involvement of stakeholders and early participation of the public.

Sustainable water management is a critical element of a 'greener', more environmentally friendly economy, because healthy and resilient ecosystems provide the services needed to sustain human well-being. For this reason, local authorities need to ensure that economic sectors, such as agriculture, energy and transport, also adopt management practices that keep water ecosystems healthy and resilient.

Suggested actions

Local authorities are "on the front line" when it comes to safeguarding the territory that is within their municipal boundaries. They are the eyes and ears that can detect anomalies and create initiatives to ensure the maximum protection of the environment and the social needs of the population. However, it is of extreme importance to engage the local population in the task of looking after and caring for the natural assets of the area and working with them to better understand and protect the environment.

The local authority is responsible for the implementation of the relevant legislation regarding the use of water and can impose rules and regulations to ensure citizens behave properly. However, through cooperation, educational programs and incentivization schemes, local authorities can stimulate and support citizens' initiatives and good practices. This can be done individually, through schools and faith organisations but is more often channelled through civil society groups.

The European Union has a number of civil society organisations working to protect and improve the environment. To ensure strong, fair and effective legislation and implementation they often group together to work across the continent at local, regional, national and European level. One such group is The European Environmental Bureau and it is the largest network of environmental citizens' organisations in Europe. It currently consists of 180 member organisations in 38 countries, including a growing number of networks, and representing some 30 million individual members and supporters.

The EEB was instrumental in launching a campaign calling on the European Commission to defend the EU law that protects all sources of Europe's water, such as rivers, streams, lakes, wetlands and groundwater, during its ongoing evaluation (known as a 'Fitness Check'). In a landmark decision for Europe's rivers, lakes and wetlands, the European Commission announced that the EU's strong water legislation — the EU Water Framework Directive (WFD) — will not be changed.

Most citizens react to situations that impact them directly. So, local actions to resolve local problems are a common occurrence when it comes to environmental action. Climate Change affects the whole planet but it is local actions that are proving that solutions can be found even if the global problem still hasn't been resolved.

In July 2020, citizens in Spain submitted a 'popular legislative initiative' (PLI), which allows citizens to propose a law, to the Spanish parliament. The PLI sought recognition of the right of the Mar Menor lagoon to exist as an ecosystem and to be protected and preserved by the government and residents. Mar Menor is the largest saltwater lagoon in both Spain and in Europe. For several decades, the lagoon has been subjected to significant pollution and ecological damage, resulting purportedly from discharge from nearby agricultural and mining activities, poor sewage systems in towns adjacent to the lagoon, and inadequate regulations and environmental protection action.

On 27th October 2021 640,000 signatures were handed in to the Central Electoral Office in Madrid and on 21st September 2022, the Spanish Government approved the law that gives legal personality to the Mar Menor. Approval of the law gives the lagoon representation by three groups: legal guardians, a monitoring committee of 'protectors' and a scientific advisory board. Any citizen or legal entity can file a lawsuit on behalf of the lagoon to enforce its rights.

References

PAPERS:

Gianluca Grilli and John Curtis: Knowledge and awareness of water quality protection issues within local authorities

José Félix Nevado Cienfuegos: Water Management by Local Authorities. The Right to an Adequate Environment

Joyce Valdovinos: The remunicipalization of Parisian water services: new challenges for local authorities and policy implications

WEBSITES

Water Framework Directive. (2024, September 19). Environment. https://environment.ec.europa.eu/topics/water/water-framework-directive_en

Bathing water. (2024, September 19). Environment. https://environment.ec.europa.eu/topics/water/bathing-water_en

Drinking water. (2024, September 19). Environment. https://environment.ec.europa.eu/topics/water/drinking-water_en

Urban wastewater. (2024, September 19). Environment. https://environment.ec.europa.eu/topics/water/urban-wastewater_en

Nitrates. (2024, September 19). Environment. https://environment.ec.europa.eu/topics/water/nitrates_en

Floods. (2024, September 19). Environment. *https://environment.ec.europa.eu/topics/water/floods_en*

EU Marine Strategy Framework Directive. (n.d.). Research and Innovation. https://research-and-innovation.ec.europa.eu/research-area/environment/oceans-and-seas/eu-marine-strategy-framework-directive_en

Biodiversity strategy for 2030. (2024, September 11). Environment. *https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en*

Zero Pollution Action Plan. (2024, July 8). Environment. *https://environment.ec.europa.eu/strategy/zero-pollution-action-plan_en*

From Farm To Fork: Press corner. (n.d.). European Commission - European Commission. *https://ec.europa.eu/commission/presscorner/detail/en/fs_20_908*

CAP 2023-27. (2024, September 23). Agriculture and Rural Development. *https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27_en*

UN Biodiversity Conference (COP 15). (2024, September 16). UNEP - UN Environment Programme. https://www.unep.org/un-biodiversity-conference-cop-15

Agriculture and the green Deal. (n.d.). European Commission. *https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/agriculture-and-green-deal_en*

Protecting the environment and oceans with the Green Deal. (n.d.). European Commission. *https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/protecting-environment-and-oceans-green-deal_en*

A blueprint to safeguard Europe's water resources. (n.d.). European Environment Agency. *https://www.eea.europa.eu/policy-documents/a-blueprint-to-safeguard-europes*

Evaluation of EU water legislation concludes that it is broadly fit for purpose but implementation needs to speed up. (2019, December 12). European Commission. *https://commission.europa.eu/news/evaluation-eu-water-legislation-concludes-it-broadly-fit-purpose-implementation-needs-speed-2019-12-12_en*

Admin, P. B. (2020, June 23). EU water law will NOT be changed, confirms European Commission. EEB - the European Environmental Bureau. https://eeb.org/eu-water-law-will-not-be-changed-confirms-european-commission/

Protection of groundwater against pollution | EUR-Lex. (n.d.). https://eur-lex.europa.eu/EN/legal-content/summary/protection-of-groundwater-against-pollution.html

State of bathing water. (n.d.). European Environment Agency. *https://www.eea.europa.eu/themes/water/europes-seas-and-coasts/assessments/state-of-bathing-water*

Explanatory Memorandum to COM(2006)397 - Environmental quality standards in the field of water policy - EU monitor. (n.d.). *https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m1c3gyxp/vi8rm2zui5yx*

European Maritime Safety Agency – EMSA | European Union. (n.d.). European Union. *https://european-union.europa.eu/institutions-law-budget/institutions-and-bodies/search-all-eu-institutions-and-bodies/european-maritime-safety-agency-emsa_en*

Danube River Protection Convention | ICPDR - International Commission for the Protection of the Danube River. (n.d.). https://www.icpdr.org/about-icpdr/framework/convention

Convention on the Protection of the Oder against Pollution FAOLEX. (n.d.). https://www.fao.org/faolex/results/details/en/c/LEX-FAOC039457/

Explanatory Memorandum to COM(2000)61 - Conclusion of the new Convention for the protection of the Rhine - EU monitor. (n.d.). https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m1c3gyxp/vi8rm2y8j1zm

EU Strategy for the Baltic Sea Region. (n.d.). European Commission. https://ec.europa.eu/regional_policy/policy/cooperation/macro-regional-strategies/baltic-sea_en

EU Strategy for the Danube Region. (n.d.). European Commission. https://ec.europa.eu/regional_policy/policy/cooperation/macro-regional-strategies/danube_en

EU strategy for the Adriatic and Ionian region. (n.d.). European Commission. https://ec.europa.eu/regional_policy/policy/cooperation/macro-regional-strategies/adriatic-ionian_en

Water and sanitation are a human right! Water is a public good, not a commodity! (n.d.). European Citizens' Initiative. https://citizens-initiative.europa.eu/initiatives/details/2012/000003/water-and-sanitation-are-human-right-water-public-good-not-commodity_en

Murcia, R. (2021, October 28). La ILP presenta casi 640.000 firmas para dotar a la laguna de personalidad jurídica. RTVE.es. https://www.rtve.es/noticias/20211028/ilp-consigue-objetivo-firmas-congreso/2207182.shtml

European waters -- Assessment of status and pressures 2018. (n.d.). European Environment Agency. https://www.eea.europa.eu/publications/state-of-water

EEB - the European Environmental Bureau. (n.d.). EEB - the European Environmental Bureau. https://eeb.org/

Further readings

World Water Day: Scarcity and drought, a priority for the EU Green Deal and the EU Mission 'Restore our oceans and waters.' (2023, March 21). European Research Executive Agency. https://rea.ec.europa.eu/news/world-water-day-scarcity-and-drought-priority-eu-green-deal-and-eu-mission-restore-our-oceans-and-2023-03-21_en

Water. (n.d.). WWF. https://www.wwf.eu/what_we_do/water/

Water management in the Mediterranean countries of the European Union. (n.d.). https://www.iemed.org/publication/water-management-in-the-mediterranean-countries-of-the-european-union/

Module 9

Waste management

Lawrence Sudlow and Ignacio Garcia

Key-words

Reduce
reuse
recycle

Targeted SDGs

#1, #2, #3, #6, #9, #11, #12, #13, #14, #15

EU Green Deal

Waste Framework Directive, Biodiversity strategy for 2030, Zero Pollution Action Plan, EU strategy for sustainable and circular textiles, Batteries Directive, Directive on end-of-life vehicles, Landfill Directive, Extractive Waste Directive, Packaging Directive, Directive on the disposal of PCBs/PCTs, RoHS Directive, Sewage Sludge Directive, Ship Recycling Regulation, Regulation on persistent organic pollutants (POPs), Waste Shipments Regulation, WEEE Directive, Single-Use Plastics (SUP)

Summary

This module aims to identify EU legislation related to waste management in the European Green Deal and offer solutions to reach EU reduction and recycling targets. Waste prevention; reduction of use of plastics; strategies for managing organic, electronic and textile waste; closing and replacement of landfills; deposit and return solutions; packaging and storage.

Unit 1 *Reduce. The EU sets out to prioritize the prevention of waste. That is, implementing measures to be taken before a substance, material or product has become waste. The Waste Framework Directive obliges Member States to "establish waste prevention programmes"*

Unit 2 *Reuse. Within the EU waste management hierarchy, the second objective is "Preparation for reuse". The reuse of products and the setting up of systems promoting repair and reuse activities (Article 9 (1) (d) Waste Framework Directive) obliges Member States to encourage the reuse of products and the setting up of systems promoting repair and reuse activities, including in particular for electrical and electronic equipment, textiles and furniture, as well as packaging and construction materials and products, in order to prevent waste generation. Reuse and repair are extending products' lifespans and thus preventing them from becoming waste. Reuse is preserving raw materials and energy used in production and distribution, and it is one of the key elements in the transition to a circular economy. In order to boost reuse some Member States have introduced national binding targets for reuse of overall waste or specific waste streams.*

Unit 2 *Recycle. The waste recycling rate — proportion of waste generated that is recycled — has increased in the EU-27. Driven by EU binding recycling targets, this indicates progress towards using more waste as a resource and achieving a circular economy. The rate of progress has stagnated recently and in some cases reversed, with packaging waste recycling decreasing in the past five years. In 2021 the majority of waste was still disposed of through incineration or landfill operations. Achieving circularity in Europe and minimizing environmental impacts from natural resource use requires continuous ambitious waste management policy setting to incentivise recycling and discourage waste disposal in landfills and incineration plants.*

Learning outcomes

- *Understand how EU legislation impacts on the management of waste*
- *Have a vision of how the European Green Deal covers waste management*
- *Be aware of local waste solutions found across Europe*

Module content

Introduction

We are facing major global challenges: climate change, loss of biodiversity and inequality. To deal with all this, the European Green Deal aims to transform the European economy into a sustainable, resource-efficient and competitive economy:

- *To stop producing net GHG emissions by 2050*
- *Economic growth is decoupled from the use of natural resources*
- *There are no people or places left behind in this development.*

The ambition for the European Union to be climate neutral is contained in the climate objectives for 2030 and 2050, one of them being the creation and implementation of a clean and circular economy. The EU Waste Regulation, therefore, sets standards for waste management and indicates the path that Member States must follow to meet common targets agreed by the European Parliament and Council.

The European Union's waste policy has as its main objective, the prevention of waste. Waste generated has to be transformed into high-quality reusable materials. To do this, waste collection systems within Europe must be harmonized, new standards for sustainable and efficient waste management must be introduced and existing ones must be more demanding.

In addition, it is essential to become aware, in all spheres of life, both public and private, of the model of production and consumption in which we find ourselves immersed and which leads to a perverse system in which there is an overexploitation of natural resources, while we throw away valuable resources without giving them new opportunities.

Preventing the generation of waste, managing waste in an environmentally friendly way, and making use of the secondary materials contained in waste are key elements of the EU's environmental policy. The EU waste policy aims to change the linear system of "Extract, produce, use and throw away" into a Circular Economy that maximizes the recovery of materials that are present in waste and that should be considered resources.

The European Green Deal aims to promote growth through the transition to a modern, resource-efficient and competitive economy. As part of this transition, various EU waste laws will be reviewed. The Waste Framework Directive is the EU legal framework for the treatment and management of waste and introduces an order of preference to manage waste, known as the "Waste Hierarchy".

The EU's waste policy aims to protect the environment and human health and help the transition towards a circular economy. To this end, it has established a series of objectives and goals to: improve waste management, stimulate innovation in recycling and limit landfilling.

State of the art

Main EU Legislation regarding waste:

- *Waste Framework Directive 2008 amended*
- *Directive 2018/851, on waste*
- *Directive 2018/850 on landfill*
- *Directive 2018/852 on packaging and packaging waste. Under Review*
- *Directive 2018/849 on vehicles, batteries and RAESS*
- *Directive (EU) 2019/904 on single-use plastics*

The Waste Framework Directive establishes some fundamental principles when indicating that waste must be managed:

- *Without endangering human health or nature*
- *No risk to water, air, soil, plants and animals*
- *Without causing annoyance due to odor or noise*
- *No adverse effects that affect the natural landscape or areas of special interest*

These principles are broadly formulated.

In addition, it provides a very important definition of waste to distinguish when a substance is a waste and when it is a secondary raw material or material from which something can be made.

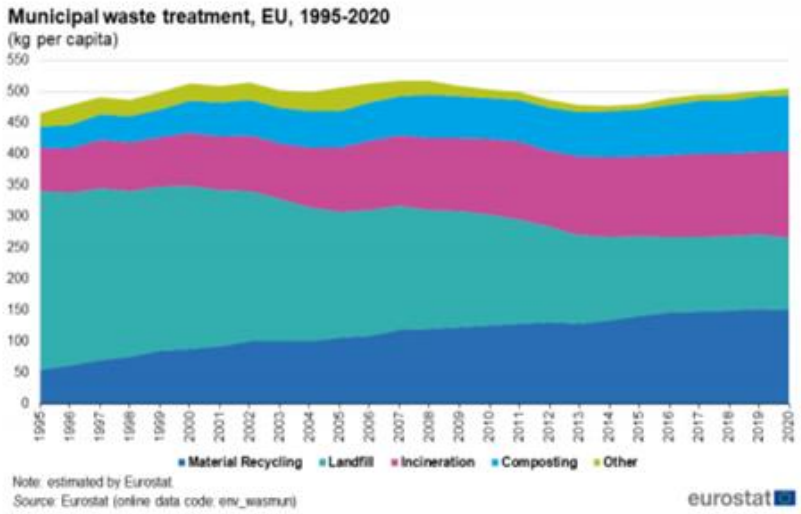
Some key elements:

- *The waste hierarchy (in the following order of priority): prevention, preparation for reuse, recycling, energy recovery and disposal*
- *The "polluter pays" principle. This basic principle has its origin in international law. It is linked to the principle of "common but differentiated responsibilities". This means that the countries that have contributed the most to the problem (climate change through C02 emissions) should also bear a greater share of the costs of changes to mitigate the problem. This means that the most polluting countries bear the greatest responsibility.*
- *Introduces the concept of Extended Producer Responsibility.*

In 2015, the EC approved a package of measures on the circular economy, to "boost competitiveness, create jobs and generate sustainable growth". From here arises, among other measures, directive 2018/851/UE that modifies the framework directive in some aspects. Its purpose: to protect the environment, human health and resources.

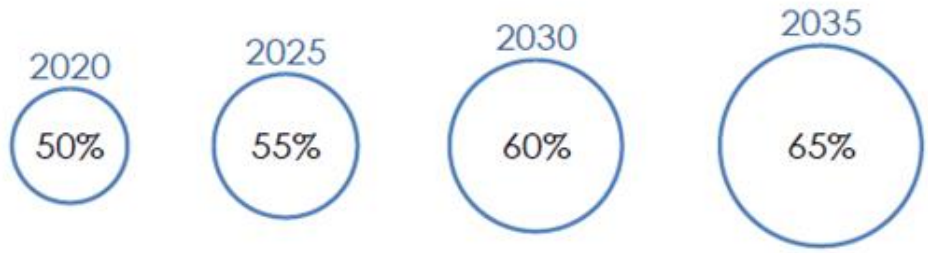
The Waste Framework Directive:

- *Establishes minimum operating requirements for extended liability schemes,*
- *Reinforces regulations on prevention,*
- *Sets recycling targets for municipal waste,*
- *Establishes the obligation of separate collection for bio-waste, textiles and hazardous waste.*
- *Indicates economic incentives for the application of the waste hierarchy, such as the Payment for Generation or the canon for dumping and incineration.*



Packaging and Packaging Waste Directive:

It is currently under review. The goal is to ensure that all packaging is reusable or recyclable by 2030 and contributes to reducing the carbon footprint to zero by 2050. To this end, it proposes new recycling targets for a series of plastic packaging and packaging reuse targets for 2030 and 2040, indicating that the companies that use them will have to establish systems to guarantee their reuse.



Recycling targets

Approximately 40% of the plastics and 50% of the paper consumed in the European Union are used for packaging, and these together account for 36% of solid urban waste.

Challenges

The Circular Economy Action Plan requires new waste management targets relating to prevention, reuse, recycling and landfill. It tries to adapt the economy to the ecological transition and strengthen competitiveness, while protecting the environment and conferring new rights on consumers. Its measures apply to the complete life cycle of products and Its implementation could increase the EU's GDP by an additional 0.5% by 2030 and create around 700,000 new jobs.

In 2035, only 10% will go to landfill

Member States are obliged to transpose European directives into state law and ensure that regional and municipal authorities comply with the law. It is precisely the latter that are in the most direct contact with the public and on which the responsibility for collection and treatment falls, but always in coordination with higher administrations.

The European Union sets deadlines for directives to become national law and monitors progress to ensure that European policy, which has been agreed by Member States, is implemented and within the stipulated time frame. Member States, regional and local authorities can and should aim to "do better" by taking the initiative to improve the Waste Framework Directive and implementing the initiatives before the stipulated deadline. However, the reality is often very different, as Member States and regional and local authorities fall behind and do not reach the targets set for compliance. This can lead to sanctions and other mechanisms that the European Union uses to encourage compliance with European law. Even so, there are still some hurdles to overcome.

On March 2, 2023, Municipal Waste Europe brought together key stakeholders to discuss the waste legislation implementation gap in the EU, as despite its importance, political will is still lacking in some members.

The discussion focused on exploring the reasons and finding viable and sustainable solutions. The discussion covered a wide range of topics such as efficient waste shipments, the potential for waste-to-energy, improving recycling rates, and the critical role that recycled content targets play in driving the transition to a greener, circular economy and the importance of enforcement in addressing and combating illegal activities. Among all the interventions we would highlight:

"We cannot afford to waste the materials and energy embedded in waste. Therefore, we must properly enforce European waste laws and the waste hierarchy. There is no going back, not if we want to achieve environmental targets and climate conditions for which we strive." Ella Stengler, CEWEP General Secretary

"We cannot afford to waste the materials and energy embedded in waste. Therefore, we must properly enforce European waste laws and the waste hierarchy. There is no going back, not if we want to achieve environmental targets and climate conditions for which we strive."

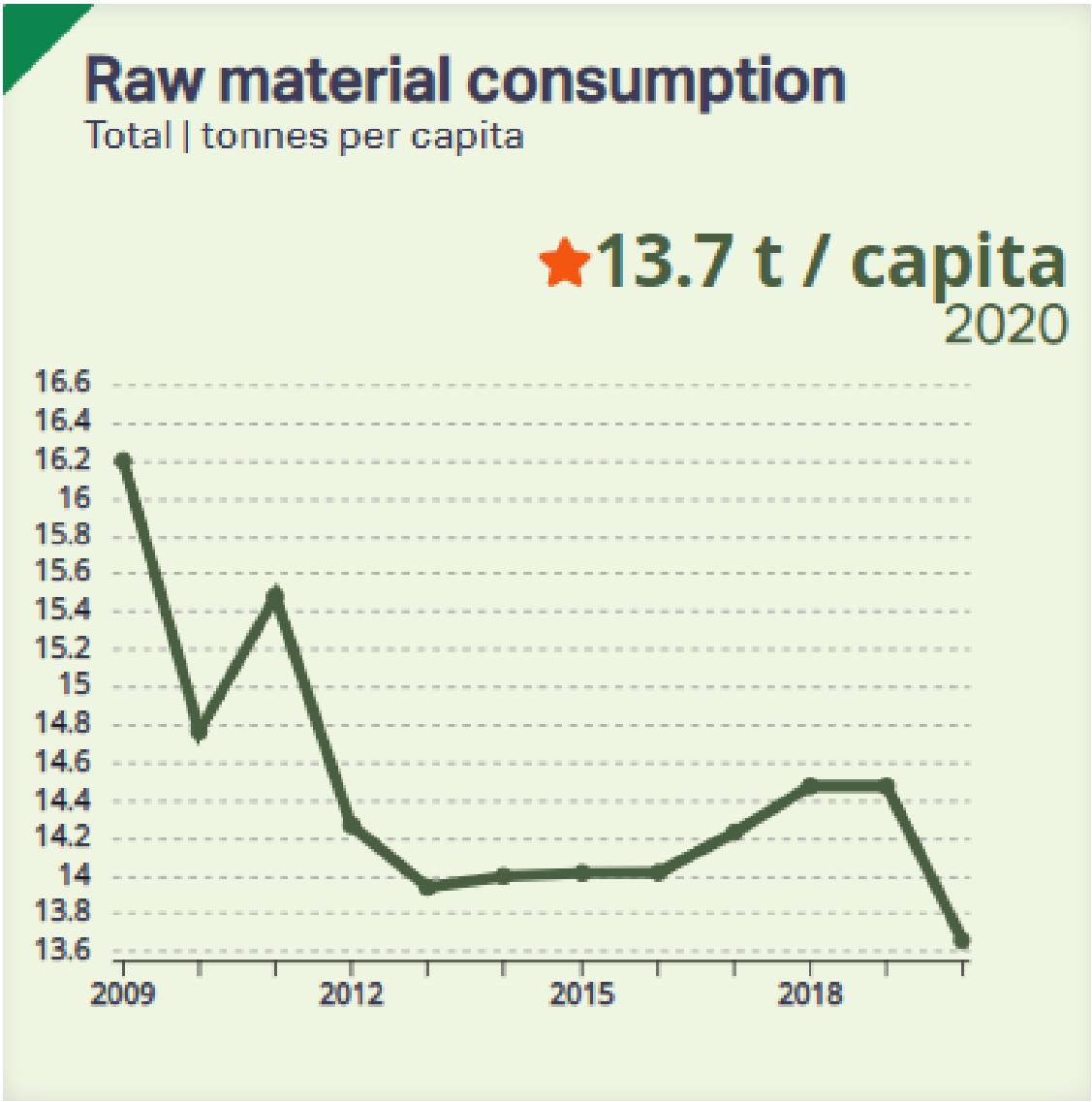
Local Assessment

The objectives of the European Green Deal in terms of waste management are clear and municipal authorities should not wait for state or regional legislation to work towards compliance with the Waste Framework Directive at local level. The application of best practices at the municipal level will ensure that regional and national objectives are met.

In this way, we should use the knowledge of the best management practices that allow us to advance in the objective of transforming the European economy into a sustainable, respectful and efficient economy in the use of resources, as well as fair, so as not to leave anyone behind. In line with this, we recommend the zero waste philosophy, as a way of acting and living in accordance with the stated objective.

Within the European Union there are a number of Non-Governmental Organizations that are working to improve the situation with regard to waste management and treatment and are involved in the development of European, national and local legislation. More importantly, they are involved in mobilizing people to participate in transforming our habits in relation to waste. This includes encouraging people to work with their local authorities, as well as doing their own bit.

The first objective set by the Waste Hierarchy is the prevention of waste. We are responsible for the waste we generate and therefore it is essential to take into account the entire life cycle of a product, from the time it is designed and manufactured, until it reaches its destination, is consumed and is no longer useful to us. "The best waste is the one that is not generated." And for this, it is essential to be aware of where our pattern of production and consumption takes us, and to change it, modifying habits.

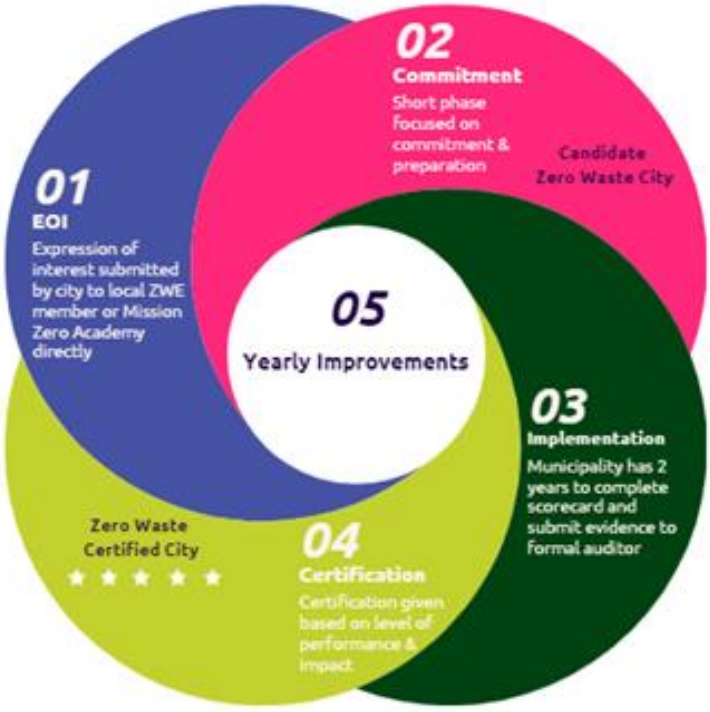


An important network at the European level is Zero Waste Europe, an organization that connects and supports a group of 34 local and national NGOs from all over Europe that share common values and objectives and work together for a future without waste, driving and promoting the Path to Zero Waste.

It is an organization with extensive experience in the implementation of "zero waste" strategies at the local and regional level. The Zero Waste Europe network, created in 2007, is a space for growth, inspiration and innovation, where members work together with a strong and united voice to drive change in Europe.

The zero-waste movement has, since its creation more than 10 years ago, incorporated over 450 municipalities throughout Europe into the network. Recently, in 2022, with the aim of accelerating the transition towards zero waste and the implementation of the circular economy in European towns and cities, a European certification standard was launched. It is carried out through MiZA, Zero Waste Europe's sister entity, and there are already 12 certified municipalities in Europe:

- *Slovenia: Vrhnika, Borovnica, Log-Dragomer, Bled y Gorje*
- *Italy: Capannori qs*
- *Spain: Boalo-Cerceda-Mataelpino, Torrelles de Llobregat, Hernani, Astigarraga y Usurbil*
- *Germany: Kiel*



Zero Waste

The Reuse Vanguard Project, has been created by Zero Waste Europe with the aim of putting reusable systems at the center of the solutions agenda and creating the conditions for them to reach takeaway food and beverage and e-commerce. The project is being worked on in 6 European cities: Berlin, Paris, Rotterdam, Barcelona, Ghent and Leuven (Belgium), to test new reuse models and create a model for cities. In Ghent the system for cups in football stadiums is in operation. An estimated 1 million plastic beer glasses per season are recovered, 30,000 to 40,000 per game.

Suggested actions

Tax on single-use plastic items

Tübingen – Germany, with a population of 90,000. In January 2022, the city took the pioneering steps of implementing a city wide tax on single-use plastic items, which formed just one part of a wider strategy to foster reuse within the city. The original idea for the tax came from the current city council, who wanted to tackle the persistent high volumes of street litter generated and left in public spaces, the majority of which came from single-use food and beverage containers. The city calculated that each year it spent on average 700,000 Euros cleaning up and disposing of waste within public spaces, while further analysis showed that 70% of the waste collected in public bins was single-use packaging.

Despite being a priority for many years for EU municipalities, even today we can find 30% to 50% organic waste in the "rest/other waste" fraction. However, this year is key for improvements since in 2024 it must be collected separately. Separating the organic at origin, the rest of the fractions present a higher quality for recycling, which provides greater potential economic income from its sale to the secondary materials market.

Proper treatment of organic waste, such as composting, has significant benefits for the local community, ranging from increased availability of fertilizers for local farmers/businesses, and subsequently healthier local soil.

Residuos municipales: objetivos de la UE y situación en los Estados miembros

Objetivo de reutilización y reciclaje de residuos domésticos para 2025: **≥55 %**

Objetivo de disposición de residuos municipales en vertederos para 2035: **≤10 %**

	Residuos municipales generados (kg / cápita - 2018)	Tasa de reciclaje y compostaje (2017)	Tasa de disposición en vertederos (2017)
*UE-28**	***489***	*46 %*	*24 %*
Dinamarca	***766***	46 %	1 %
Malta	***640***	6 %	93 %
Chipre	***640*** **	16 %	82 %
Alemania	***615***	68 %	1 %
Luxemburgo	***610***	48 %	7 %
Austria	***579***	58 %	2 %
Irlanda	***567*** **	41 %	26 %
Finlandia	***551***	41 %	1 %
Francia	***527***	43 %	22 %
Países Bajos	***511***	54 %	1 %
Portugal	***508***	28 %	50 %
Italia	***499***	48 %	26 %
Grecia	***497*** **	19 %	80 %
Eslovenia	***486***	58 %	13 %
España	***475***	33 %	54 %
Lituania	***464***	48 %	33 %
Suecia	***434***	47 %	0 %
Croacia	***432***	24 %	75 %
Bulgaria	***423***	35 %	62 %
Eslovaquia	***414***	30 %	61 %
Bélgica	***411***	54 %	1 %
Letonia	***407***	23 %	31 %
Estonia	***405***	28 %	20 %
Hungría	***381***	35 %	49 %
República Checa	***351***	38 %	48 %
Polonia	***329***	34 %	42 %
Rumanía	***272***	14 %	71 %

* Datos incluyendo a Reino Unido ** Datos de 2016

Otros métodos de eliminación de residuos, como la incineración, elevan el total al 100%.

Fuentes:
Eurostat, Agencia Europea del Medio Ambiente, Comisión Europea

europarl.eu

Incineration (2017)

53%
2%
40%
33%
59%
45%
22%
1%
13%
19%
53%
45%

From 2027, only separate collection composting will count in recycling

References

Waste Framework Directive. (n.d.). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

New EU rules to reduce, reuse and recycle packaging | News | European Parliament. (n.d.). https://www.europarl.europa.eu/news/en/press-room/20240419IPR20589/new-eu-rules-to-reduce-reuse-and-recycle-packaging

Circular economy action plan. (n.d.). Environment. https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

EU restrictions on certain single-use plastics. (n.d.). Environment. https://environment.ec.europa.eu/topics/plastics/single-use-plastics/eu-restrictions-certain-single-use-plastics_en

New law on more sustainable, circular and safe batteries enters into force. (2023, August 17). Environment. https://environment.ec.europa.eu/news/new-law-more-sustainable-circular-and-safe-batteries-enters-force-2023-08-17_en

End-of-Life vehicles. (n.d.). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/end-life-vehicles_en

Landfill waste. (n.d.). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/landfill-waste_en

Extractive Waste Directive (2006/21/EC) – Policies - IEA. (n.d.). IEA. https://www.iea.org/policies/17702-extractive-waste-directive-200621ec

PCBs/PCTs. (n.d.). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/pcbspcts_en#:~:text=The%20Directive%20on%20the%20disposal,them%20as%20soon%20as%20possible.

ROHS directive. (n.d.). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/rohs-directive_en

Sewage sludge. (2023, December 20). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/sewage-sludge_en

Ships. (2023, December 6). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/ships_en

Waste shipments. (2023, November 17). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/waste-shipments_en

Waste from Electrical and Electronic Equipment (WEEE). (n.d.). Environment. https://environment.ec.europa.eu/topics/waste-and-recycling/waste-electrical-and-electronic-equipment-weee_en

Further reading

Useful links and articles

Friends of the Earth Europe. (2023, August 18). Less is more: resource efficiency through waste collection, recycling and reuse - Friends of the Earth Europe. https://friendsoftheearth.eu/publication/less-is-more-resource-efficiency-through-waste-collection-recycling-and-reuse/

EU policy - Zero Waste Europe. (2024, April 25). Zero Waste Europe. https://zerowasteeurope.eu/our-work/eu-policy/

Manifesto. (2024, July 8). Municipal Waste Europe. https://www.municipalwasteeurope.eu/publications/manifesto

Module 10

Environmental education and social participation

Germán Vargas Callejas; Joaquim Ramos Pinto

Key-words

Environmental Education
Social Participation
Citizenship
Lair Society
Social and Environmental Policy
"Empowerment".

EU Green Deal

Education and training

Targeted SDGs

#4; #11; #16; #17

Summary

Building eco-citizenship to address local and global environmental issues requires valuing training processes that empower local communities to be decision-makers in their destinies. This fosters their ability to influence solutions to the global socio-environmental crisis.

Participatory processes in sustainability strategies should be seen as socio-educational practices that educate for social participation and democratic decision-making, thereby promoting a healthy environment and effective action against global challenges like the climate crisis.

The module on Environmental Education and Social Participation comprises three units:

1

Environmental Education for Democratic Participation

This unit emphasizes that environmental problems gain social significance when individuals and society recognize and value natural resources. The relationship between society and nature reflects the economic and political structures of today's world.

2 **Response to Socio-Environmental Problems**

Focusing on climate change, biodiversity loss, and consumerism, this unit highlights the role of citizen participation in addressing these issues. It promotes participatory processes as educational practices that raise awareness and transition towards environmentally responsible and socially just societies.

3 **Barriers to Social Participation**

This unit examines the political, economic, and technological factors that limit social participation. It addresses training gaps for decision-makers and citizens, which hinder the construction of active citizenship in response to socio-environmental challenges.

Learning outcomes

- *Recognizing participation as the cornerstone for societal change, acknowledging the political and transformative significance of education.*
- *Contextualizing environmental issues within the personal and collective interactions that occur locally and globally between humans and the natural world.*
- *Mobilizing and inspiring active participation in the conservation and care of natural environments.*
- *Understanding the education-participation relationship as a unique, multidimensional process (political, economic, cultural, environmental) that impacts the well-being of all forms of life.*
- *Fostering awareness and knowledge among individuals about their capacity to engage in the socio-environmental transformation of their communities.*

The educational and social objectives of citizen participation contribute significantly to preventing environmental issues, addressing dysfunctions that affect both people and the environment, and promoting sustainable behaviors and lifestyles that respect nature. Ultimately, this cultivates an eco-social citizenship committed to a culture of sustainability.

State of the art

Environmental Education as a challenge to new ways of educating for democratic participation and decision-making.

Basic Situations for Socio-Environmental Participation

Social participation is contextualized within the spatial, temporal, and situational frameworks that underpin social construction processes (Almansi et al., 2011). Key contexts that form the foundation for participatory processes include:

The Environment

All life exists within an environment composed of diverse elements that sustain individual existence and the collective development of societies. This environment consists of both natural and artificial components, with human presence being essential. Changes in the environment impact all forms of life, prompting individuals to participate actively in improving, transforming, or maintaining their environmental conditions.

Everyday Life Situations and Events

Life is a continuous sequence of events, requiring individuals to find their place in the world and derive meaning from their experiences. Everyday situations challenge individuals to position themselves and make decisions based on their level of engagement in various circumstances, whether problematic or not. This dynamic is a fundamental driver of participatory processes.

Interests and Stakeholders

Motivation to engage in social events arises from individual or collective interests. Participatory processes are often triggered by the impact of reality on people's lives, prompting them to respond and commit to addressing issues that concern them, whether through personal experience, vested interest, or empathy for others' realities.

Institutional Management of Public Affairs

Effective management of public resources significantly affects citizens, who utilize available means to respond—through participation—to improve conditions reliant on local or national governments, as well as private entities like banks, companies, and NGOs. According to Álvarez (2019), "citizen participation can occur on behalf of specific groups or individuals, without the necessity of being part of a political party, public administration, or collective." This means that citizens can engage in environmental stewardship and the management of public affairs either as individuals or as part of organized groups. The key is that every citizen has the opportunity to engage in matters that concern or interest them.

Methods of Participation

Environmental participation manifests in various interconnected forms, including:

Individual Participation in Everyday Social Construction

Daily activities inherently impact the environment. Thus, individual actions—such as enjoying public spaces, participating in festivals, or engaging in cultural events—reflect a commitment to cultural construction and environmental care. Living daily life becomes a participatory act that fosters integration into social processes and awareness of one's natural and social surroundings.

Participation as a Social Movement

This form of participation involves the collective organization of citizens to address specific problems. Social movements emerge from a critical understanding of societal issues, prompting citizens to organize and advocate for their demands. Such organized participation requires comprehensive educational practices to equip society members with the skills for effective civic organization and public participation.

Institutional Participation

Institutional participation involves dialogue between citizens and public management entities. This form is often characterized by high levels of regulation and bureaucracy, aimed at addressing citizens' demands. However, excessive regulation can inhibit citizen engagement and reduce the effectiveness of participatory processes.

All three modalities of participation are interdependent; the effectiveness of one influences the others.

Participation Dynamics

Participation can be categorized into three dynamics:

1. Top-Down Participation

This dynamic occurs when an authority or social agents dictate how participation should occur, limiting citizen action to passive acceptance and execution of directives. The relationship is primarily vertical, with citizens responding to imposed frameworks.

2. Bottom-Up Participation

In contrast, this occurs when citizens self-organize to express their needs and address issues that concern them. Here, participation stems from individual awareness and the capacity for self-organization.

3. Dialogic Participation

This dynamic fosters an exchange of ideas among various societal agents, including representatives from public and private organizations and civil society members. Dialogic participation is rooted in consensual problem-solving and collaborative efforts among engaged social actors.

Participation Requirements

Effective participatory processes must encompass the following elements:

Communication

Participation hinges on citizens' awareness of their environment and community. Effective communication from both public managers and citizens is essential. This communication should energize interest in local issues and motivate citizens to engage in transforming the social and environmental conditions affecting them.

Informed Knowledge

Citizens must be informed about the socio-environmental issues impacting their lives and the planned actions to address them. This information should be clear, understandable, and actionable, enabling informed decision-making. Equipping citizens with the knowledge needed to participate effectively is crucial for meaningful engagement.

Mechanisms, Spaces, and Opportunities for Participation

Citizen involvement will be ineffective without established mechanisms, spaces, and opportunities for participation. This necessitates creating procedures that facilitate engagement, providing traditional and innovative spaces for shared social construction, and ensuring opportunities tailored to specific problems and situations. Such frameworks enhance citizens' ability to engage with and address issues that matter to them.

Environmental Education and Social Participation as a response to socio-environmental problems

This unit begins by identifying key environmental issues, including the climate crisis, biodiversity loss, ecosystem degradation, over-exploitation of natural resources, consumerism, and the adverse effects of the current economic development model. These issues highlight the necessity for both personal and social action in addressing environmental challenges.

The Environment as a Context for Participation

Participation is warranted when individuals or social groups recognize and confront environmental degradation, deprivation, or other related issues that can be addressed through public involvement. Effective participatory action hinges on a comprehensive understanding of the environment and its implications.

Environmental contexts encompass diverse actors, various problems, and multiple responses to those problems. As such, participatory processes—whether individual or collective—must account for the complex meanings of the environment to facilitate meaningful participation and transformation.

Environmental Problems and Social Responsibility

Environmental problems refer to critical situations resulting in environmental destruction. According to Meira (2013, p.32), "The environmental problems that exist are mainly due to the fact that people and communities do not have 'objective' and 'real' knowledge of what the real world is like and how it works." Therefore, both general education and Environmental Education specifically should aim to impart scientific knowledge that enables individuals to understand their environment accurately and act accordingly.

The perception of environmental issues can vary significantly based on individuals' levels of education, awareness, and sense of responsibility. Additionally, different communities face distinct environmental challenges, some with local significance and others with national or global implications, such as anthropogenic climate change.

The degree to which individuals experience environmental problems correlates with their level of information and understanding. As Meira (2023) notes, Environmental Education should raise citizens' awareness of their surroundings, informing and training them to adjust their behaviors, habits, and values in line with environmental needs. This fosters a balanced relationship between humans and the ecosystems they inhabit, essential for preserving ecological vitality.

When addressing environmental problems, it is vital to consider relationships. Reality is interconnected; no social or natural issue exists in isolation. Human actions are intertwined with the origins and consequences of environmental challenges, just as natural phenomena can have profound effects—positive or negative—on individual and collective lives.

Human action can mitigate or resolve environmental issues, and this participatory action is influenced by several factors, including:

- *Our vision of nature*
- *The level of information about specific socio-environmental issues*
- *The perceived or experienced impact of environmental problems (both direct and indirect)*
- *Sensitivity and empathy towards identified environmental problems*
- *The perception of one's ability to engage and effect change*
- *Perceived community support for addressing the problem*
- *Personal commitment to solving the environmental issue*

In participatory action, it is crucial to consider both the individual and collective dimensions of environmental issues to clearly identify their causes and consequences and adjust intervention strategies accordingly. Through educational initiatives, it is important to inform, train, and sensitize citizens to environmental challenges, empowering them to take action. Building eco-social citizens—individuals who understand, interpret, and transform environmental issues into responsible and just solutions—is essential for effectively caring for life and its supporting systems.

Participation in addressing environmental challenges is not exclusive to any specific group or agent. While the level of responsibility may differ based on each agent's decision-making capacity, all citizens—integrated into various social institutions or acting individually (Álvarez-Vergnani, 2019)—should be motivated to care for both local and global environments. Key stakeholders include community members (neighbors, associations), government bodies (local and national), educational institutions (schools, universities, vocational training centers), businesses, and citizens from all backgrounds.

Key Steps for Participation in Environmental Issues

This section is inspired by guidelines from the Association of Basque Municipalities (EUDEL, 2010), as referenced by Ramilo & Fernández (2012). They propose the following essential steps to initiate a participatory process:

1. *Knowledge: Remain attentive and informed.*
2. *Involvement: Understand the reasons and purposes of participation.*
3. *Stimulating Environmental Participation: Encourage active engagement.*
4. *Monitoring and Evaluation: Assess progress and outcomes.*

Political, economic and technological limitations and training gaps in socio-environmental participation

Several factors impede citizen participation in addressing environmental challenges. These include:

1 Political Constraints

Public life is organized by national, provincial, local, and community governmental and administrative institutions, which have a responsibility to manage public goods according to the demands and needs of citizens. However, social actors must also engage actively in proposing, executing, and supervising public projects. This necessitates the development and exercise of their right to participate in decision-making processes. When political frameworks are rigid or unresponsive, they can stifle citizen involvement and undermine the effectiveness of participatory initiatives.

2 Economic Constraints

While citizen participation is a fundamental right, exercising it often requires an investment of time and financial resources. This creates a significant barrier to accessing participation mechanisms, particularly concerning environmental issues. Citizens may need economic support to cover bureaucratic costs, organize strategies, and utilize mechanisms designed to protect and care for the environment. Economic disparities can exacerbate inequalities in participation, limiting the voices of those without sufficient resources.

3 Technological Limitations

In today's information and communication society, many aspects of life are mediated through digital and virtual interactions. While new technologies can create opportunities for social action and creativity, they also present challenges that can restrict citizen involvement in social construction processes. Digital divides—inequities in access to technology and digital literacy—can hinder participation, leaving some individuals and communities at a disadvantage in engaging with environmental issues.

4 Capacity Building and Knowledge Limitations

Effective environmental participation hinges on three key factors: citizen awareness, informed knowledge of environmental problems, and the motivation to enact change. Citizens must possess the education necessary to critically analyze their realities and understand the mechanisms available for participation. Without this foundational knowledge, individuals may feel ill-equipped to engage meaningfully in addressing environmental challenges.

5 Community Limitations

Although social participation is a personal right, its effectiveness is cultivated within contexts that guarantee freedom of expression and respect for diverse opinions as integral to democratic citizenship. For community participation to flourish, individuals must recognize their shared destiny (Vargas, 2004) and understand that environmental problems ultimately affect everyone—both individually and collectively. A lack of communal awareness or solidarity can impede collaborative efforts to address environmental issues.

European Union Legislative Documents and Initiatives

The European Union has promoted various initiatives and adopted a series of legislative documents to promote Environmental Education for Sustainability, rights of access to environmental information and social participation, such as:

1. Aarhus Convention: *The Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters is an international treaty that establishes rights of access to environmental information and public participation in environmental decision-making. The European Union ratified the Convention in 2005 and implemented it through Regulation (EC) No 1367/2006, also known as the Aarhus Regulation [+info] [+info];*

2. Directive 2003/4/EC: *Establishes the public's right of access to environmental information and repeals the previous Directive 90/313/EEC. The Directive is transposed into national law through the Law on Access to Administrative and Environmental Documents. This directive aims to ensure that the public has quick and easy access to environmental information held by public authorities, promoting public participation in environmental issues;*

3. Regulation (EC) No 1049/2001: *Regulation (EC) No 1049/2001 of the European Parliament and of the Council describes the rules for access to information of the European Parliament and of the Council;*

4. Treaty of Lisbon (2009): *This treaty reinforces the importance of citizens' participation in the democratic life of the European Union. The European Citizens' Initiative (ECI), introduced by the Lisbon Treaty, allows one million citizens from at least seven different Member States to ask the European Commission to propose new legislation in areas of EU competence [+info];*

5. Regulation (EU) No 211/2011: *This regulation lays down the provisions for the European Citizens' Initiative, facilitating a direct mechanism for citizens to influence the Union's political agenda;*

6. Charter of Fundamental Rights of the European Union: *Proclaims the rights of all EU citizens and includes the right to good administration, which covers the right of citizens to be heard and to participate in decision-making processes that affect them. The Charter, which has the same legal value as the Treaties, includes Article 11 on freedom of expression and information; Article 42 on the right of access to documents and Article 37 on environmental protection [+info];*

7. Aalborg Partnership (1994): *Also known as the Charter of European Cities for Sustainability, it is a commitment by European local governments to promote citizen participation in sustainable development processes at local level [+info];*

8. Directive 2003/35/EC: *Directive 2003/35/EC establishes public participation in respect of the drawing up of certain plans and programmes relating to the environment and amends Council Directives 85/337/EEC and 96/61/EC;*

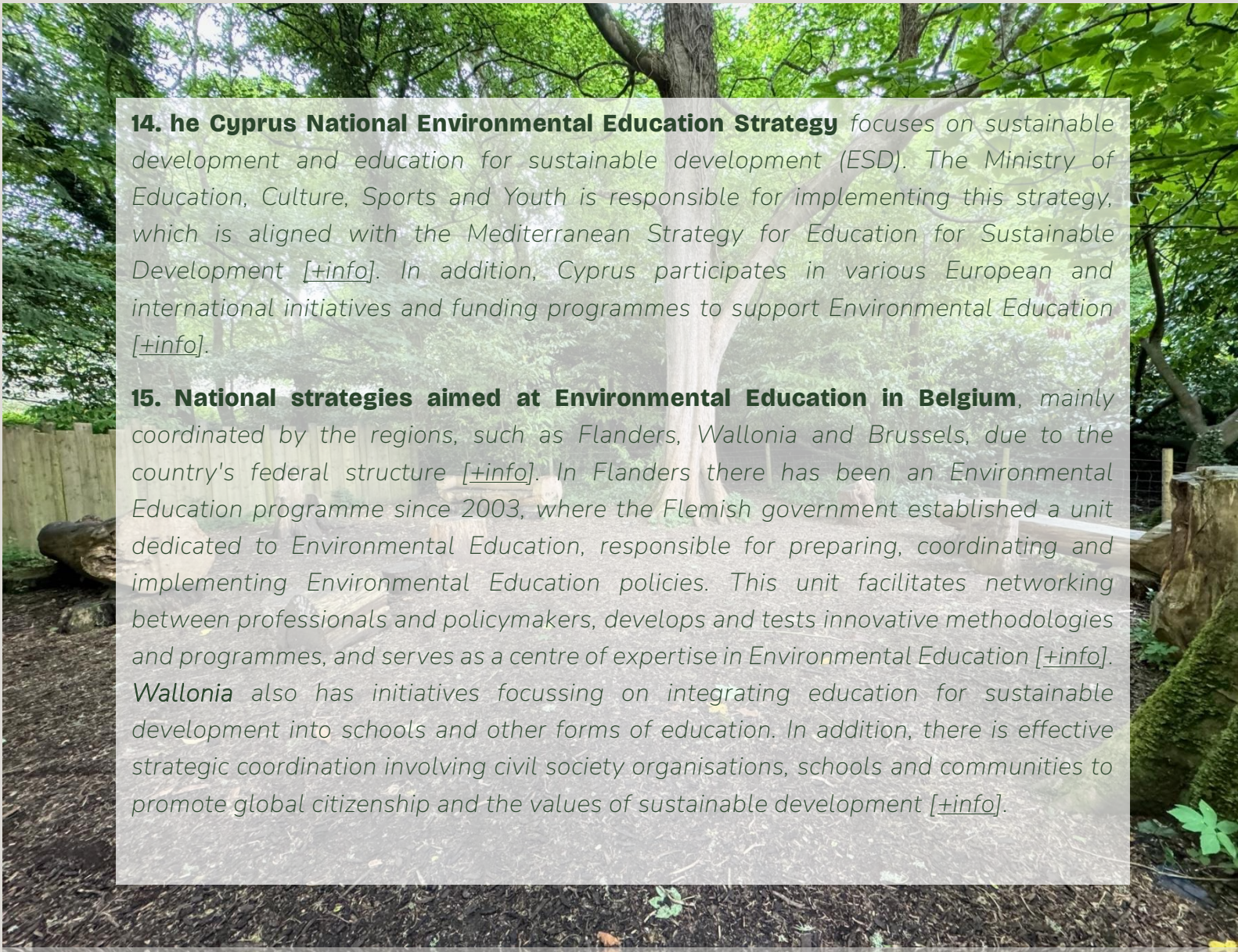
9. Council Recommendation on learning for the green transition: *The Council Recommendation, adopted in June 2022, sets out how sustainability can be integrated into all aspects of education and training. The recommendation calls on member states to integrate sustainability into teaching and learning [+ info];*

10. European Sustainability Competence Framework (GreenComp): *This framework defines key sustainability competences that should be acquired by students, such as systemic and critical thinking, collective action and future literacy. These competences are promoted in various educational contexts [+info];*

11. National Environmental Education Strategy (ENEA): *This is a Portuguese strategy that aims to establish a collaborative commitment to building environmental literacy. The strategy was adopted in 2017 and prioritises thematic and transversal work to guarantee national and international commitments on sustainability [+info];*

12. Plan de Acción de Educación Ambiental para la Sostenibilidad (PAEAS): *This Spanish plan was approved by the Council of Ministers in August 2021 and covers the period from 2021 to 2025. The PAEAS aims to promote environmental education for sustainability in response to contemporary socio-environmental challenges. It is based on six operational axes and 61 main actions, developed by the General State Administration and other entities involved in the sector. The plan also includes guidelines and proposals for action for various sectors and agents, such as autonomous communities, local administrations, the private sector, social and environmental organisations, and the education system [+info].*

13. National Strategy on Education for Sustainable Development (ESD): *Ireland has a national strategy on Environmental Education, which it has been implementing since 2014. The first strategy covered the period from 2014 to 2020 and, due to the success and progress made, a second strategy was launched, extending to 2030. Ireland's ESD strategy aims to integrate the principles of sustainable development into all levels of the education system. It was developed through extensive public consultations and includes a detailed action plan for the period 2022-2026, with a focus on empowering students and educators to face future environmental challenges [+info]. Ireland has the Tidy Towns Initiative which is a community programme that aims to improve the local environment and promote environmental awareness, contributing to Environmental Education, with community involvement, to promote a greener Ireland [+info].*



14. he Cyprus National Environmental Education Strategy *focuses on sustainable development and education for sustainable development (ESD). The Ministry of Education, Culture, Sports and Youth is responsible for implementing this strategy, which is aligned with the Mediterranean Strategy for Education for Sustainable Development [+info]. In addition, Cyprus participates in various European and international initiatives and funding programmes to support Environmental Education [+info].*

15. National strategies aimed at Environmental Education in Belgium, *mainly coordinated by the regions, such as Flanders, Wallonia and Brussels, due to the country's federal structure [+info]. In Flanders there has been an Environmental Education programme since 2003, where the Flemish government established a unit dedicated to Environmental Education, responsible for preparing, coordinating and implementing Environmental Education policies. This unit facilitates networking between professionals and policymakers, develops and tests innovative methodologies and programmes, and serves as a centre of expertise in Environmental Education [+info]. Wallonia also has initiatives focussing on integrating education for sustainable development into schools and other forms of education. In addition, there is effective strategic coordination involving civil society organisations, schools and communities to promote global citizenship and the values of sustainable development [+info].*

Challenges

Public participation in municipal policies, especially concerning environmental issues, is a critical concern for European Union (EU) countries. The EU recognizes the importance of involving citizens in political decision-making as essential for strengthening democracy, promoting transparency, and enhancing the effectiveness of public policies. However, several barriers to effective citizen participation persist.

Challenges to Citizen Participation

1. Political Constraints

The following political limitations hinder citizen involvement in environmental decision-making:

- *Lack of Access to Information: Citizens often struggle to find clear and precise information on environmental issues and problems.*
- *Inadequate Reporting Channels: There are insufficient means and channels for reporting environmental crimes.*
- *Poor Communication: Communication channels between citizens and local governments are often ineffective.*
- *Awareness of Participation Mechanisms: Many citizens are unaware of the existing mechanisms for participation.*
- *Bureaucratic Hurdles: The high level of bureaucratization in citizen participation mechanisms can discourage engagement.*
- *Political Manipulation: There is often manipulation of reality to protect economic interests, sidelining genuine citizen concerns.*
- *Influence of Interest Groups: Political and economic interest groups may appropriate citizens' decision-making capacity, failing to address their demands and interests.*
- *Distrust in Governance: A prevailing distrust in formal systems of governance and social participation diminishes civic engagement (Almansi et al., 2011).*

2. Technological Limitations

Technological factors can also limit participation, including:

- *Trivialization of Participation: Many view participation as simply "liking" posts on social media, undermining meaningful engagement.*
- *False Sense of Participation: Virtual actions may create an illusion of involvement without leading to concrete changes.*
- *Automation of Services: The automation of citizen service channels limits opportunities for human interaction and nuanced discussions about socio-environmental issues.*
- *Lack of Digital Literacy: Many citizens lack the skills to effectively navigate virtual participation mechanisms and instruments.*
- *Saturation of Media Offerings: The overwhelming number of platforms for participation can trivialize its meaning and diminish awareness of its impact.*

3. Limitations in Capacity Building and Knowledge

Challenges in knowledge and capacity building include:

- *Fragmented Understanding: Citizens often have superficial and fragmented knowledge of environmental issues.*
- *Insufficient Training: There is a lack of training and scientific knowledge regarding environmental problems among citizens.*
- *Limited Access to Legislative Information: Citizens may not have adequate access to information on EU legislative documents and initiatives.*
- *Distorted Information: Information about environmental problems may be manipulated to serve the interests of economic and power groups.*

4. Community Limitations

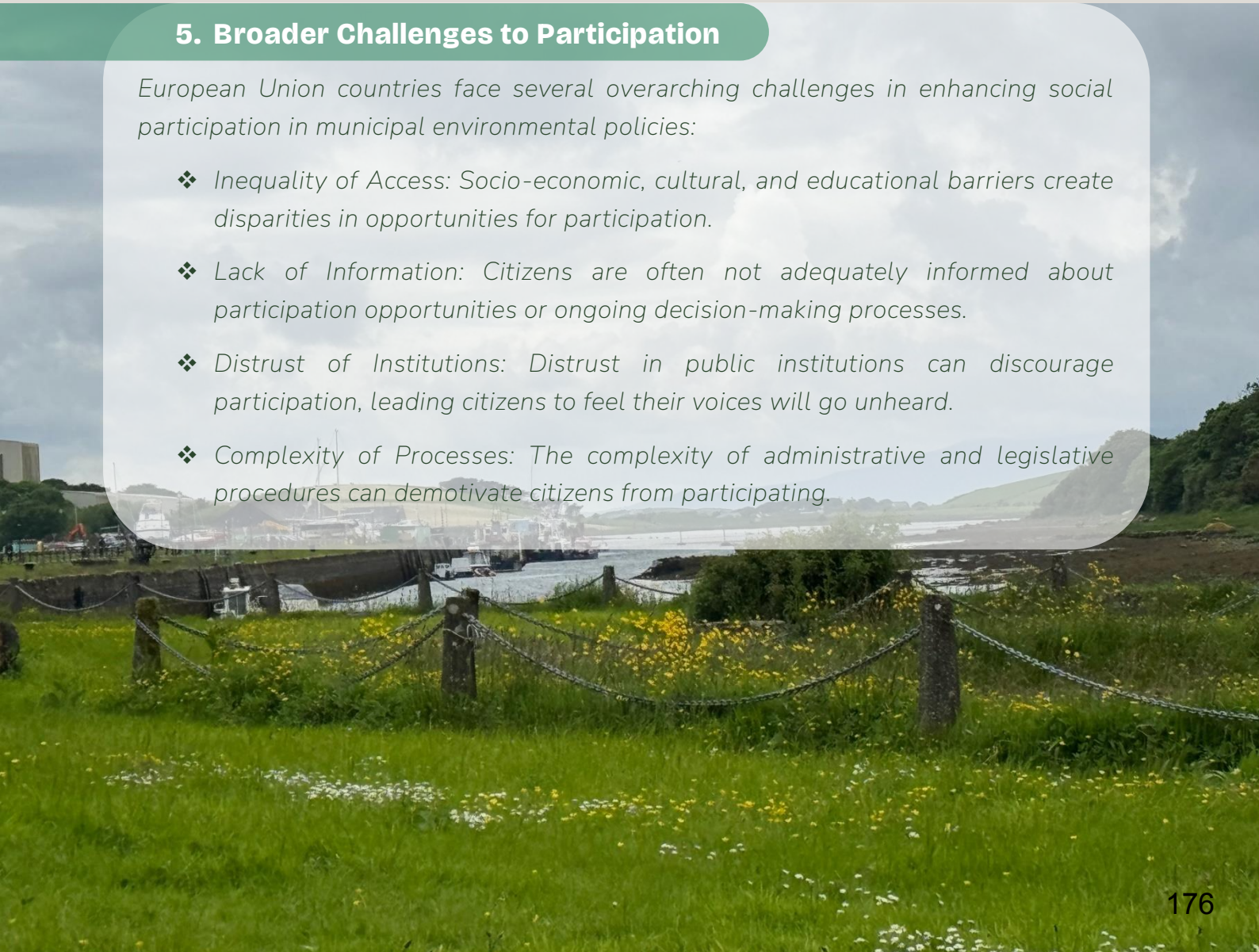
Community dynamics also present barriers to participation:

- *Indifference to Distant Problems: Many citizens may be indifferent to environmental problems that do not directly impact them.*
- *Compliance with Injustice: There can be a general compliance with situations of environmental degradation and injustice.*
- *Time Constraints: Individuals may feel overwhelmed by personal issues, leaving little time for community engagement.*
- *Weak Critical Awareness: A lack of critical awareness among the population diminishes interest in addressing environmental challenges.*
- *Fear of Participation: Many citizens fear involvement in participatory processes due to a lack of experience or potential repercussions for speaking out.*

5. Broader Challenges to Participation

European Union countries face several overarching challenges in enhancing social participation in municipal environmental policies:

- ❖ *Inequality of Access: Socio-economic, cultural, and educational barriers create disparities in opportunities for participation.*
- ❖ *Lack of Information: Citizens are often not adequately informed about participation opportunities or ongoing decision-making processes.*
- ❖ *Distrust of Institutions: Distrust in public institutions can discourage participation, leading citizens to feel their voices will go unheard.*
- ❖ *Complexity of Processes: The complexity of administrative and legislative procedures can demotivate citizens from participating.*



Strategies to Overcome Challenges

To address these barriers, various initiatives and best practices have been implemented, including:

- *Participatory Budgeting: Many municipalities in the EU have adopted participatory budgeting, allowing citizens to directly influence a portion of the municipal budget.*
- *Digital Platforms: Digital platforms for public consultations and online voting have been promoted to increase participation, particularly among young people and those with mobility challenges.*
- *Citizenship Education: Educational programs aimed at promoting civic awareness and understanding of citizens' rights and responsibilities are essential for preparing individuals for active participation.*

The EU countries are actively working to overcome barriers to public participation in municipal policies. Implementing legislative frameworks and initiatives that promote transparency, access to information, and citizenship education is crucial for strengthening citizen engagement and enhancing European democracy. Building a more inclusive and participatory society is a shared goal that requires ongoing efforts at both local and EU levels.

Local Assessment

Given the pressing challenges posed by environmental crises, especially the climate crisis, there is significant potential for citizen participation to drive meaningful change. Below are key performance indicators (KPIs) and a roadmap designed to facilitate the evaluation and improvement of participatory efforts in municipal environmental policies.

Key Performance Indicators (KPIs)

To evaluate the effectiveness of citizen participation, a set of adaptable KPIs should be established based on the unique context and dynamics of each municipality. These indicators may include:

1. Municipal Environmental Education Strategy:

- *Development and implementation of a comprehensive Municipal Environmental Education Strategy with a detailed action plan that involves all social groups and administrative structures.*

2. Participation Rates:

- *Measure the participation rate of various social groups in both the formulation and execution of the Municipal Environmental Education Strategy.*

3. Social Actor Commitment:

- *Assess the level of commitment among the municipality's social actors towards implementing the Municipal Environmental Education Strategy action plan.*

4. Community Participation Monitoring:

- *Establish plans to monitor community participation in environmental programs and initiatives, particularly those addressing the climate crisis.*

5. Participation Channels:

- *Count the number and diversity of channels and spaces available for social participation that the municipality provides to its citizens.*

6. Citizen Involvement in Decision-Making:

- *Track the number of initiatives that involve citizens directly in decision-making processes regarding environmental policies and education.*

7. Participatory Budgeting Targets:

- *Set targets for participatory budgeting dedicated to community mobilization projects related to the co-management of public spaces.*

8. Annual Budget Allocation:

- *Monitor the evolution of the annual budget allocated for environmental policies and environmental education initiatives.*

9. Training for Stakeholders:

- *Measure the number of technicians and political decision-makers trained in social participation and environmental education.*

10. Environmental Education Programs:

- *Count the number of Environmental Education, Awareness, and Communication programs implemented in the community.*

11. Citizen-Led Initiatives:

- *Record the number of initiatives proposed by citizens aimed at enhancing the local environment.*

Roadmap for action

Short Term (1-2 years)

- *Creation of Participation Spaces: Increase and establish new avenues for social participation.*
- *Facilitated Dialogue Opportunities: Provide participatory spaces for dialogue between various social actors (Gómez-Cuevas & Valls-Caroll, 2023).*
- *Decentralization of Decision-Making: Ensure decision-making processes are decentralized, allowing for broader community involvement.*
- *Broaden Participation Concepts: Move beyond formal and institutional views of participation to embrace diverse opportunities for social engagement.*
- *Training Investment: Invest in training for politicians and technicians to enhance their understanding of social participation.*

Medium Term (3-5 years)

- *Improve Formal Participation Processes: Enhance formal participation processes to ensure they effectively influence the transformation of socio-environmental conditions.*
- *Embed Participation in Daily Life: Anchor the dynamics of social participation within everyday activities and decision-making.*
- *Collective Rethinking: Foster collective thinking to reimagine current organizational systems in society.*
- *Political Responsibility: Encourage all political groups to integrate new participatory concepts into their citizenship practices:*
  - *Establish permanent institutional relationships between various local government bodies.*
  - *Create open channels for communication between politicians and citizens.*
  - *Implement ongoing information and awareness-raising campaigns for the community.*

Long Term (6-10 years)

- *Expansion of Action Networks: Develop and expand pro-environmental action networks that engage, connect, and mobilize individuals of all ages and social backgrounds.*
- *Increase Citizen Power: Enhance "citizen power" through the realization of concrete, transformative impacts on environmental issues and local governance.*

Suggested actions

In this section, we present a range of actions and strategies designed to help you understand and apply various participation techniques aimed at addressing environmental issues. Our goal is to cultivate social skills and competencies that enhance the quality and effectiveness of social and environmental participation, ultimately fostering a collective culture of sustainability within communities.

1. Importance of Social Participation

Social participation becomes effective when citizens are knowledgeable about and adept at using strategies and techniques that facilitate civic action. It is essential for both citizens and political, social, and economic decision-makers to be trained in resources that promote socio-environmental participation, viewing this as a vital socio-educational practice.

Training for participation is crucial in building a citizenry that is engaged within democratic contexts. This involves developing necessary knowledge, relevant techniques, and appropriate discourses that ensure both personal and collective involvement toward achieving an environmentally responsible and socially just society.

2. Education for Sustainable Participation

Educating for a new paradigm of participation and democratic decision-making on environmental issues necessitates defining effective education policies and local sustainability strategies. These strategies should consider:

- *Mobilization for Environmental Citizenship: Encouraging active participation in environmental stewardship.*
- *Recognition of Diversity: As Vargas (2000) highlighted, it is essential to recognize and leverage the diverse knowledge systems of the planet's various cultures.*

3. Educational Processes and Participatory Engagement

Understanding participatory processes as educational journeys in response to environmental problems means focusing on the process rather than merely the outcomes. In this context, establishing new relationships between politicians and civil society takes precedence over legal mandates or impositions.

4. Fostering a Culture of Sustainability

To promote local strategies that foster a culture of sustainability, we need proximity policies that create spaces for participatory reflection. These spaces should raise awareness of emerging socio-environmental processes and mobilize civil society's participation in decision-making, grounded in a holistic vision.

References

BOOKS:

Beierle, Thomas (2002). Democracy in Practice: Public Participation in Environmental Decisions. Routledge.

Caride, J. A. and Meira, P. A. (2004). Environmental Education and Human Development. Piaget Institute. Lisbon.

Coenen, Frans H. J. M. (Ed.) (2009) Public Participation and Better Environmental Decisions. The Promise and Limits of Participatory Processes for the Quality of Environmentally Related Decision-making. Springer.

Depoe, Stephen et al. (Eds.) (2011). Communication and Public Participation in Environmental Decision Making. SUNY series in Communication Studies.

Fernández, E. and Sotomayor, C. (2003). Democracia y presupuestos participativos. Icaria Editorial. Barcelona.

Heras, F. (2002). Entre Tantos - guía práctica para dinamizar procesos participativos sobre problemas ambientales y sostenibilidad. GEA. Valladolid.

Hoppe, Rob et al. (2018). Knowledge, Power, and Participation in Environmental Policy Analysis. Routledge.

Landström, Catharina, (2020). Environmental Participation.Practices engaging the public with science and governance. Palgrave Macmillan.

Simmons, W. Michele (2007). Participation and Power. Civic Discourse in Environmental Policy Decisions. SUNY series, Studies in Scientific and Technical Communication.

Torgler, Benno et al. (2010). Participation in Environmental Organisations. Routledge.

Worthington, Richard et al. (2012). Citizen Participation in Global Environmental Governance. Routledge.

PAPERS:

Ander-Egg, E. (1997). Participación ciudadana y protagonismo de la sociedad civil. In: Ciclos, Valladolid, Spain. 1: 22-23.

Ramos Pinto, J. (2004). Environmental Education in Portugal: Roots, influences, protagonists and main actions. In: Education, Society & Cultures. Porto. 21: 151-165.

RAMOS-PINTO, J. (2007). Social participation and environmental education: participatory processes in local sustainability strategies. A case study. In: PUJOL, R. and CANO L. (Coords). Nuevas tendencias en investigaciones en Educación Ambiental. Madrid. CENEAM - Ministry of the Environment of Spain. 83-109.

Vargas, G. (2006). The discourse and practice of environmental education as a strategy for participation and community building. ADAXE. Revista de Estudios y Experiencias Educativas, 20: 49-62.

Walls, A.E.J. (2016). Sustainability citizens: collaborative and disruptive social learning. En R. Horne, J. Fien, B.B. Beza & A. Nelson. Sustainability Citizenship in Cities: Theory and Practice, Earthscan Routledge, pp. 52-66.

Further Reading

https://www.iap2.org/mpage/Home

- Citizen participation: Analysing environmental cases

https://comunidades.cepal.org/ilpes/es/grupos/discusion/participacion-ciudadana-analisis-de-casos-ambientales

- THE AARHUS CONVENTION. Public participation in making local environmental decisions. London: Department of the environment, Transport and the regions. Accessed via the Internet on: 06/09/2022

Aarhus Convention - Environment - European Commission (europa.eu)

The European Green Deal, presented by Ursula Von Der Leyen - Our ambition: to be the first continent with a climate-neutral impact

European Green Deal | European Commission (europa.eu)

What is the European Green Deal, by Humberto Rosa | Director at the Directorate-General for the Environment, European Commission

https://www.rtp.pt/noticias/mundo/o-que-e-o-pacto-ecologico-europeu_v1232909

European Green Deal summary leaflet, European Commission: What is the European Green Deal? (rederural.gov.uk)

Parliament and the European Green Deal: European Parliament Multimedia Centre (europa.eu)

European Green Deal

https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0008.02/DOC_1&format=PDF

European Green Deal - meeting our targets: https://ec.europa.eu/commission/presscorner/detail/pt/fs_21_3688

GreenComp, the European sustainability competence framework

https://joint-research-centre.ec.europa.eu/greencomp-european-sustainability-competence-framework_en

GoGreen

LOCAL ACTION FOR EUROPEAN GREEN DEAL

Field Studies

Environmental Local Governance for the 21st Century

ZOERSEL

Associação Portuguesa Educação Ambiental

aspea

município de lousada

SOTO DEL REAL

Ireland Leave No Trace

SYNTHESIS CENTER FOR RESEARCH AND EDUCATION

Erasmus+

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein. Project number: 2021-1-BE02-KA220-ADU-000026044

Field Study Visit
Module 1:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Facilitation and Conflict Resolution, Communication

Ivana Connor

National Museum of Country Life

Institution
National Museum of Country Life

Contact
Edmond Aylward: edmond@leavenotraceireland.org

Type of participants
Go Green Participants

Date
28/05/2024

Location
Turlough, Castlebar, Co.Mayo, Ireland

Report

Goals of the visit

The main goals of the visit are reflected below:

i *Learning and Reflection: To deepen participants' understanding of Ireland's rural heritage and cultural dynamics through guided exploration and facilitated discussions.*

ii *Skill Development: To foster skills in communication, facilitation, and conflict resolution, essential for engaging in sustainability initiatives and communitybased projects.*

iii *Conflict Resolution: To equip participants with strategies and insights into resolving conflicts that may arise in environmental conservation efforts, promoting constructive dialogue and cooperation.*

iv *Awareness of Environmental Issues: To raise awareness of environmental conservation challenges and the importance of sustainable development practices, as exemplified by the Greenway Walk and cycle track.*

v *Community Engagement: To encourage active participation and collaboration within local communities, promoting dialogue and cooperation with stakeholders, including landowners, towards shared environmental goals.*

vi *Educational and Inspirational: To inspire participants to apply learned knowledge and skills in their own communities, contributing to ongoing efforts in environmental stewardship and heritage preservation.*

Short-programme

At 3pm the group got a bus to the National Museum of Country Life. The group walked into the main area and enjoyed a talk on the history of the Museum. After this the group had an hour to enjoy the inside of the National History Museum of Country life. After this the group had a discussion on the Greenway Walk/Bicycle route.

Description

Visiting the National Museum of Ireland - Country Life in Turlough provides an enriching field trip experience for participants of the GoGreen project, focusing on communication, facilitation, and

conflict resolution. Guided by Ed from Leave No Trace Ireland, participants explore exhibitions showcasing rural Irish life from the late 19th to mid20th centuries. Ed facilitates discussions that encourage reflection on the cultural and social dynamics of rural communities, including topics such as societal changes, economic challenges, and traditional practices. Interactive exhibits and workshops further enhance the learning experience by offering hands-on opportunities to explore traditional crafts and skills. These activities not only deepen participants' understanding of Ireland's rural heritage but also foster skills in active listening, effective communication, and constructive conflict resolution. Such skills are crucial for participants as they navigate diverse perspectives and contribute to sustainability initiatives within their own communities as part of the GoGreen project.

Additionally, the field trip includes a visit to the Greenway walk and cycle track, which now extends from Achill to Castlebar, ending at the Museum, providing a safe route for walking and cycling enthusiasts. Here, the group learns about the history of the Greenway and the challenges that arose between landowners and state bodies to facilitate its creation. This discussion sheds light on the complexities of balancing environmental conservation, community interests, and public infrastructure development, further enriching the participants' understanding of sustainable development practices.

At the Museum, the group also enjoys a dedicated section for questions and discussion. This opportunity allows them to delve into topics such as how to effectively communicate with landowners in their local areas, drawing from insights gained during the field trip. Discussions focus on building constructive relationships, understanding differing perspectives, and fostering collaborative approaches to environmental initiatives. Participants exchange ideas and strategies, preparing them to engage proactively with stakeholders and communities in their own regions as they continue their involvement in the GoGreen project.

Discussions and main conclusions

The field trip, organised as part of the GoGreen project, offers a comprehensive exploration of the cultural, social, and environmental dynamics shaping rural Irish communities. Through a blend of historical insights, practical workshops, and strategic discussions, participants are equipped with essential skills and knowledge to support sustainable development initiatives

1. *Cultural and Social Dynamics of Rural Communities:*

- *Societal Changes: Examination of how rural Irish communities evolved from the late 19th to mid-20th centuries.*
- *Economic Challenges: Discussion on the economic difficulties faced by rural populations and their adaptive strategies.*
- *Traditional Practices: Exploration of traditional crafts and skills, highlighting the importance of preserving cultural heritage.*

2. *Communication and Facilitation:*

- *Active Listening and Effective Communication: Participants engage in exercises to improve these skills, essential for community engagement.*
- *Constructive Conflict Resolution: Strategies for resolving conflicts in a constructive manner, crucial for sustainability projects.*

3. *Sustainable Development and Environmental Conservation:*

- *Greenway Development: The history of the Greenway walk and cycle track, including the challenges of balancing environmental conservation, community interests, and public infrastructure.*
- *Stakeholder Engagement: Techniques for effective communication with landowners and other stakeholders, emphasizing the importance of building constructive relationships.*

4. *Interactive Learning:*

- *Hands-on Workshops: Participation in activities that provide practical experience in traditional crafts, reinforcing the cultural context of rural Irish life.*
- *Group Discussions: Facilitated by Ed from Leave No Trace Ireland, these discussions encourage participants to reflect on their learning and share insights.*

Main Conclusions:

1. *Enhanced Understanding of Rural Heritage:*

- *Participants gain a deeper appreciation of Ireland's rural heritage, which informs their perspectives on cultural preservation and sustainability.*

2. *Improved Communication and Facilitation Skills:*

- *Through guided discussions and interactive activities, participants develop key skills in active listening, effective communication, and conflict resolution, which are vital for their roles in the GoGreen project.*

3. *Insights into Sustainable Development Practices:*

- *Learning about the Greenway project provides practical examples of the complexities involved in sustainable development, including stakeholder negotiation and environmental conservation.*

4. *Practical Strategies for Community Engagement:*

- *Discussions on how to communicate effectively with landowners and other stakeholders equip participants with strategies to build collaborative relationships and foster community support for environmental initiatives.*

5. *Preparation for Local Initiatives:*

- *The field trip prepares participants to apply their newly acquired skills and knowledge to their local contexts, enhancing their capacity to contribute to sustainability projects within their communities.*

Overall, the field trip is an enriching experience that combines cultural education with practical skill development, preparing GoGreen project participants to effectively engage with diverse stakeholders and promote sustainability in their local areas.

References

Country Life Museum

https://www.museum.ie/en-IE/Museums/Country-Life

Castlebar to Turlough Green way

https://www.mayo.ie/attractions/castlebar-turlough-greenway

Field Study Visit
Module 2:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Conflict resolution, effective communication and active listening

Ivana Connor

Visit Details

Institution
Leave No Trace Ireland

Contact
Karina Dingerkus: karina@giorria.com

Type of Participants
Go Green participants

Date
28/05/2024

Location
Castlebar, Co Mayo, Ireland

Report

Goals of the visit

The primary goals for Lough Lannagh are to promote sustainable and harmonious use of the area for all visitors, ensure safety and accessibility, and enhance the natural environment. Balancing the interests of various user groups such as water users, fishermen, dog walkers, kids playing, joggers, and walkers is crucial. Encouraging respectful behaviour and adherence to rules among all visitors is essential for minimising conflicts and preserving the site's beauty and functionality. During this field trip the group will see an example of a functioning community space that has overcome conflict between stakeholders and community groups. Throughout this workshop the group recreates scenarios that can occur in different areas of the lake and understand each group's point of view on conflict and why there may be different opinions in relation to the functions of a space. Why creating group role plays opens up different forms of communication and allows peer learning? While Karina facilitated the workshop, she included everyone in the learning experience. Below are different forms of conflict that can be found. This is then broken down into how the goal of this is to show how to engage with stakeholders, different methods of doing this and different forms of communications.

Short-Programme

At 2 PM, we first visited the Community Park. Following this, we explored the Outdoor Symposium Area, walked along the Designated Walkway for the Community, checked out the Amenities Developed for Community Use, and finally, we visited the Outdoor Sport Facilities.

Description

Dr Karina Dingerkus led the group around Lough Lannagh, facilitating an informal talk focused on developing active listening, effective communication, and conflict resolution skills. As they walked, she encouraged participants to engage in thoughtful discussions, prompting them to reflect on the diverse needs and perspectives of the various user groups who frequent the area.

The group participated in outdoor role-playing exercises, applying the skills they had developed during the morning sessions. These exercises were designed to simulate real-life scenarios, helping participants to practise handling conflicts that might arise in a community setting. Lough Lannagh experiences high foot traffic daily, with each visitor creating a unique experience while enjoying the

natural environment. This field trip provided participants with an immersive experience, exposing them to the everyday challenges faced by the Castlebar community.

Through these activities, the group practised various communication strategies. They first role-played as community members encountering common issues such as dog waste left on paths, youths playing loud music, and unmarked tracks. Participants acted out discovering these problems and expressing their frustration. This exercise aimed to highlight the emotional responses that such issues can provoke and the importance of addressing them constructively.

Next, participants assumed the roles of stakeholders, such as local authorities and community leaders, exploring ways to address these issues through regulated communication and active listening. They discussed potential solutions like installing more waste bins, creating designated quiet zones, and improving signage for pathways. This aspect of the field trip emphasised the importance of engaging with the community, fostering open dialogue, and collaboratively finding solutions to maintain harmony in shared public spaces.

An open discussion was held on how to engage the community effectively through public meetings, social media, and on-site questionnaires. The group explored various methods of communication and engagement to ensure broad community involvement. As a practical exercise, they re-created an on-site questionnaire tailored for Lough Lannagh. This questionnaire served as an example, allowing the group to practise formulating questions that would gather valuable feedback from the community about their experiences and concerns while using the area.

By running through these activities, the group was able to practise different areas of communication, enhancing their ability to empathise with others and develop practical solutions. Dr Dingerkus underscored the importance of these skills not only in managing conflicts but also in building a more inclusive and cooperative community environment.

Discussions and main conclusions

From the experience led by Dr. Karina Dingerkus around Lough Lannagh, several key learnings can be identified:

1. *Active Listening: Participants engaged in activities that emphasised the importance of active listening. Through thoughtful discussions and role-playing exercises, they practised listening to diverse perspectives and understanding the needs of various user groups in the community.*
2. *Effective Communication: The field trip highlighted the essential role of effective communication in resolving conflicts and addressing community concerns. Participants practised expressing their viewpoints constructively and explored communication strategies suitable for different stakeholders, such as community members, local authorities, and leaders.*
3. *Conflict Resolution Skills: Outdoor role-playing exercises simulated real-life scenarios, allowing participants to practise handling conflicts that commonly arise in community settings. This practical experience equipped them with skills to manage and resolve conflicts, fostering a more harmonious environment at Lough Lannagh.*
4. *Community Engagement: The group discussed and practised methods for engaging the community effectively, including public meetings, social media outreach, and on-site questionnaires. They learned the importance of broad community involvement in decision-making processes and gathering feedback to improve public spaces.*
5. *Empathy and Collaboration: By assuming different roles and perspectives during the role-playing exercises, participants developed empathy towards others and gained insights into collaborative problem-solving. They explored solutions collaboratively, such as installing waste bins or creating quiet zones, which are essential for maintaining community harmony.*
6. *Practical Application: The on-site questionnaire exercise provided practical experience in formulating questions to gather community feedback effectively. This hands-on approach allowed participants to apply their learning directly to the context of Lough Lannagh, ensuring the relevance and applicability of their communication and engagement skills.*
7. *Building Inclusive Communities: Dr. Dingerkus emphasised that these skills not only manage conflicts but also contribute to building inclusive and cooperative community environments. Understanding diverse perspectives and engaging with empathy are crucial for creating spaces where all community members feel valued and heard.*

Overall, the field trip facilitated by Dr. Karina Dingerkus provided participants with a comprehensive learning experience in active listening, effective communication, conflict resolution, community engagement, empathy, and collaborative problem-solving. These skills are essential for fostering a supportive and inclusive community environment at Lough Lannagh and beyond.

References

Lough Lannagh. (n.d.). MayoCoCo.

https://www.mayo.ie/en-ie/living-in-mayo/look-forlocal/lough-lannagh

Things to do Lough Lannagh, Activity Breaks Castlebar. (2014, October 30). Lough Lannagh. http://www.loughlannagh.ie/things-to-do/onsite

Field Study Visit
Module 3:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Natural Capital and Cultural Heritage

SYNTHESIS Center for Research & Education

Visit Details

Institution

Home4Cooperation & Association for Historical Dialogue and Research (AHDR)

Contact

- *Home4Cooperatoin:*

- *Phone: +357 22 44 57 40 / +90 548 834 5740*
- *Email: admin@home4cooperation.info*
- *Address: 28 Marcou Dracou Street, Nicosia, 1102, Cyprus*

- *Association for Historical Dialogue and Research*

- *Phone: +357 22 44 57 40*
- *Email: ahdr@ahdr.info*

Address: 28 Marcou Dracou Street, Nicosia, 1102, Cyprus

Type of participants

- Public officers/technicians
- Councillors
- Enviromental project or department coordinators
- Enviromental advisors
- Consultants who work for/advise local governance

Date

Monday, 24th April 2023

Location

Nicosia, Cyprus

Report

Goals of the visit

Nicosia's Buffer Zone, Medieval Venetian Walls of Nicosia, Paphos Gate, Panagia Faneromeni Square, Ledra Street Crossing Point, Buyuk Han, The Samanbahce Quarter

Description

During the course of our excursion to Nicosia, we were given the chance to gain firsthand exposure to the city's rich heritage and distinctive way of life. We went to a variety of locations, each of which provided a fresh viewpoint on the history and development of the city.

The space that is being used by Home4Cooperation and the Association for Historical Dialogue and Research was our first destination. This location, which is situated in the middle of the buffer zone, acts as a focal point for activities that are concerned with the preservation of cultural heritage and the promotion of sustainable development. We were given the opportunity to gain insight into the work that the organisation does and how it seeks to foster mutual understanding and cooperation among different communities.

Following that, we went on an excursion into the buffer zone itself, which is a demilitarised region that divides the Greek and Turkish Cypriot communities on the island. We observed the division first-hand, which served as a stark reminder of the ongoing political tensions in the region.

After that, we went to see the Mediaeval Venetian Walls of Nicosia, which are a relic of the city's long and illustrious past. The city's defences relied on these walls, which were constructed in the 16th century and served in that capacity for the city. The walls, which are an important landmark in the city's cultural heritage, impressed us with their grandeur and craftsmanship. These walls are an important landmark.

Our next destination was Paphos Gate, which was originally constructed as one of the city's entrances. We gained an understanding of the historical significance of the gate as well as the function it served in the city's overall defensive strategy.

We found Panagia Faneromeni Square to be a lively and active public space that is wellliked by both the people who live in the area and those who are just passing through. Because the square is home to a number of cafes and restaurants, visitors are able to get a taste of some of the more traditional dishes that are served in Cyprus.

One of the most memorable parts of the tour was when we crossed the buffer zone through the Ledra Street Crossing Point. We were made aware of the ongoing political tensions in the region by the stringent security measures and passport checks that were in place when we visited the area.

Our next stop was at Buyuk Han, a stunning Ottoman caravanserai dating back to the 16th century that has been beautifully restored and transformed into a cultural centre. During our time there, we were given the opportunity to explore the courtyard and learn about the history of the building, which during the Ottoman era was a centre for the trading of goods as well as cultural traditions.

We concluded our tour of Nicosia by going to the Samanbahce Quarter, which is one of the city's oldest neighbourhoods. In order to gain a better understanding of the history of the city, we ventured through the congested streets and analysed the region's historically significant buildings.

The time we spent in the field in Nicosia was, all in all, a memorable and enlightening experience. We were given the opportunity to gain knowledge about both the city's illustrious cultural history and the ongoing political tensions that continue to drive a wedge between the community. The trip served as a useful reminder of the significance of fostering mutual understanding and cooperation among communities, as well as the significant role that cultural exchange plays in fostering both peace and the development of sustainable practises.

Discussions and main conclusions

Several discussions and observations emerged during our visit to Nicosia, shedding light on the connection between biodiversity, the political and social context, and the intertwining of nature and cultural heritage. These discussions provided useful insights into the city's current state, challenges, and opportunities for positive change.

The role of the green line in fostering biodiversity was one significant aspect that emerged from the discussions. Because of political division, the buffer zone inadvertently became a haven for flora and fauna. Nature flourished in the absence of human interference, and the green line served as a unique corridor for wildlife, promoting biodiversity in the region.

Regardless of the political or social context, people on both sides of the divide desired interaction and connection. Different cultural landscapes, as well as a shared appreciation for nature and cultural heritage, served as a common ground for community building. River use and tree reforestation projects brought people together, emphasising the value of collaboration and collective action in environmental conservation.

The COVID-19 pandemic's burst of nature was a topic of discussion, emphasising the positive impact of reduced human activity on the environment. The vibrant display of flora and fauna served as a powerful reminder of how humans and nature are inextricably linked. It sparked discussions about environmentally friendly practises and the importance of protecting and preserving the natural environment for future generations.

The discussions also touched on the role of trees as catalysts for discussion about best practises. Partners in reforestation projects were inspired by successful initiatives in other countries. Learning from global experiences and adapting them to the local context became clear as essential for promoting environmental sustainability.

During the discussions, one significant point was raised about the historical use of exotic species for water control, which had unintended consequences. Corrective measures were acknowledged as being required to address the ecological imbalances caused by the introduction of these species. This emphasised the importance of making informed decisions while keeping long-term ecological implications in mind, as well as the need for ecological restoration and native species conservation in mind.

Education and community engagement emerged as critical components for building bridges and promoting a shared vision. Concerns were raised during the discussions about changes to school curricula that occurred without adequate consultation from the government. Education was viewed as a powerful tool for fostering mutual understanding, empathy, and a shared sense of responsibility for the environment and cultural heritage.

Community housing was also a major topic of discussion. It became clear that community-led initiatives could be critical in promoting inclusive and sustainable development. Nicosia could foster social cohesion and create spaces that reflect the diverse needs and aspirations of its residents by involving local communities in decisionmaking processes and by providing affordable housing solutions.

The discussions also provided a reality check in terms of other European countries' awareness of the Nicosia conflict and its unique challenges. The lack of understanding of the complex political and social context highlighted the importance of sharing experiences and encouraging dialogue to raise awareness and support for peaceful resolutions.

The visit sparked debate about the country's history and its relevance today. Historical structures have been seen undergoing transformations, changing uses and adapting to changing needs. Some buildings emphasised tourism, while others emphasised business, and still others embraced cultural

initiatives. These adaptive reuse projects demonstrated cultural heritage's resilience and ability to evolve while maintaining historical significance.

Youth activism, particularly in the buffer zone, served as a powerful inspiration. Young activists' determination and enthusiasm for bridging divides and promoting dialogue was evident. Their initiatives emphasised the importance of empowering and involving youth in shaping the city's future.

Finally, the discussions and observations made during the Nicosia visit provided valuable insights into the complex relationship between biodiversity, the political and social context, and the connection between nature and humans.

References

Association for Historical Dialogue and Research (AHDR). (2024, October 1). Association for Historical Dialogue and Research (AHDR). https://www.ahdr.info/

Home for cooperation. (n.d.). https://www.home4cooperation.info/

Field Study Visit
Module 4:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Biodiversity conservation and ecosystem services

Claudia Vanessa Silva

Visit Details

Institution

Municipality of Lousada's Mata de Vilar forest

Contact

matadevilar@cm-lousada.pt, +351 939 752 535

Type of participants

Public officers/technicians, Councillors, Environmental project or department coordinators, Consultants who advise local governance

Dates

Wednesday, 21 February 2024

Location

Lousada, Portugal

Report

Goals of the visit

The goal of this visit was to demonstrate how a municipality can acquire a degraded space with significant ecological potential and cultural value, rehabilitate it through national funding and volunteer programs, and make it beneficial for the community. It is important not only to inspire but also to present practical, easily replicable nature conservation solutions and activities to engage with people, that the participants will not only see, but feel.

Short-Programme

Interpretive Trail of the Miradouro: Mata de Vilar's historical background; Initial actions and funding; Power of volunteerism and community engagement. Accessible trail, sensory trail, and forest school.

Tour of Biodiversity-Promoting Structures: Deadwood amphitheater, sound cone, ponds, nest boxes, deadwood fences, hibernaculum, sandarium, and insect hotels

Description

Mata de Vilar, located in the heart of the Sousa Superior Protected Landscape, is a 14hectare forest managed by the Municipality of Lousada. It is the largest continuous native forest in Lousada, comprising oak, beech, and coniferous trees. Its uniqueness and the sustainable management model applied have earned it the international certificate of High Conservation Value Forest by FSC®.

The history of Mata de Vilar is closely tied to the Feijó family, a prominent family in the region. This forest played a significant role in the lives and histories of many generations from Lousada who worked in and witnessed its development. From 1923 onwards, Mata became a true family recreational space, while still contributing to the agricultural economy of the farm and the adjacent Casa de Vilar. However, around the 1950s, following the death of the sole heir, the forest was abandoned, its most valuable trees plundered. Over the following years, exotic species like pines and invasive acacias came to dominate the landscape.

Recognizing the importance of such a space in a fragmented, densely populated region dominated by intensive agriculture and forestry, the Municipality of Lousada acquired Mata de Vilar in 2008. After thorough biodiversity surveys and studies, the first major action took place in 2016 with the removal of 6 hectares of exotic species during an international work camp, supported by dedicated young European volunteers. In 2018, the Vilar Integra project was launched—Integrated Requalification of the Mata de Vilar: from Tourism to Sustainability—promoted by the Municipality of Lousada with support from Turismo de Portugal. This project is based on a series of integrated and innovative interventions aimed at enhancing the natural and cultural heritage of the region, diversifying and enriching tourism offerings, raising public awareness of nature conservation and sustainability, and promoting the value of the local social landscape.

Today, the forest is equipped with an Interpretation Center, laboratory, workshop, seed bank, and educational nurseries, catering to a wide range of audiences. There are several trails, including the country's first accessible forest trail and a sensory trail. A pilot project for a forest school is also underway. Mata de Vilar has its own environmental education program, offering schools, families, and the general public a choice of 52 activities and workshops covering topics such as literature, science, biodiversity, deadwood, ponds, water habitats, music, and arts. Visitors are encouraged to reconnect with nature through unique experiences, such as giant wooden sound cones placed in the forest, or amphitheaters that, aside from being ideal for photos, demonstrate the importance of deadwood for the ecosystem's decomposers.

The space is also used by the municipality's nature conservation team to experiment with more efficient pond-building techniques, the role of deadwood fences, and how to accelerate the regeneration of native forests while optimizing resources. A set of biodiversity-promoting structures, easily replicable at home or in schools, is also presented, including bat and bird nest boxes, hibernaculum, sandarium, insect hotels, and bird feeders.

The fauna list of Mata includes more than 70 species, with notable mentions of threatened bat species, the red squirrel, the honey buzzard, and the emerald dragonfly, a species protected at the

European level. In terms of flora, 112 species have been catalogued, with highlights including legally protected species such as the cork oak, gilthead, daffodil, and holly.

Discussions and main conclusions

The first topic raised among participants was the delay in utilizing the Mata after it was acquired. It was explained that the municipal administration was undergoing a transition period, and it took several internal discussions and battles before a plan was approved to designate the area primarily as a nature protection zone, an innovation at the time.

The voluntary effort that removed 6 hectares of invasive species was highly praised, prompting a discussion on active volunteer programs in participants' respective countries. However, there was also concern about how significant resources are often spent on removing invasive species, only for them to reestablish themselves. It was explained that it is more effective to focus on smaller areas and ensure ongoing followup actions, as was done in the Mata. Here, two staff members regularly remove the regrowth of invasive plants that previously dominated the area. This need is gradually decreasing as the native seed bank becomes more established, with trees now able to provide enough shade to prevent the return of invasives. In fact, only a few complementary shrub species were planted, as most of the flora was already present in the form of a seed bank. The main issue was that the invasive species, with their rapid growth, inhibited the native plants from establishing.

As they walked the trail, participants experienced the sense of peace and fulfilment that the forest exudes, while appreciating the diverse life forms surrounding them. Questions about visitors arose, leading to discussions on how to promote activities effectively, as well as the ongoing challenge of balancing nature tourism with the sustainability of the territory. It was also noted that managing visitor requests can be challenging, especially when considering habitat protection, as there is still a need to raise awareness about the delicate balance between leisure activities and nature conservation.

Upon reaching the biodiversity-promoting structures, the visitors were surprised by how simple they seemed to be to construct, sparking ideas for similar initiatives in their own communities. The low cost of materials was also highlighted, with many of the structures using bio-waste from municipal pruning activities. Many organisms critical to ecosystem balance require specific microhabitats to thrive—conditions often disrupted by human activity. By creating structures that replicate these natural niches, biodiversity can be enhanced, benefiting bats, birds, reptiles, amphibians, invertebrates, and fungi. The biologist guiding the tour also emphasized the potential for environmental education activities using these resources, from sampling sessions and construction workshops to simple observation of the ecology of the species present.

At the conclusion of the visit, the key takeaways were: the importance of having enough well-trained environmental education staff capable of facilitating activities for all types of audiences; the need to create multipurpose spaces rather than single-use areas; and the necessity of selecting technicians and professionals with knowledge of natural dynamics and practical experience when undertaking ecological restoration and infrastructure development

References

Mata de Vilar. (n.d.). https://www.sousasuperior.pt/destinations/mata-vilar/

Module 4:

Ecosystem services & Biodiverse Carbon Project

Claudia Vanessa Silva

Visit Details

Institution

VERDE - Association for the Integrated Conservation of Nature

Contact

geral@verde-associacao.pt , +351 934 405 804

Type of participants

Public officers/technicians, Councillors, Environmental project or department coordinators, Consultants who advise local governance

Date

Wednesday, 21 February 2024

Location

Lousada, Portugal

Report

Goals of the visit

The goal of this workshop was for participants to learn about ecosystem services, how to measure them, and their potential for nature conservation and the economic resilience of rural and/or natural territories. Additionally, the aim was also to introduce the history of VERDE, a local youth association founded with municipal support, which today runs an innovative project that values the ecosystem services of the municipality's large trees, protecting them

Short-programme

The importance of big old trees and their threats; Ecosystem services, what they are, how to measure them, and the challenges and opportunities involved; How the association was founded with municipal support; The scope and impact of the Carbono Biodiverso project.

Description

A "Green Giant" refers to large, old trees that are essential to ecosystems due to their immense environmental benefits. These trees provide crucial ecosystem services such as carbon sequestration, helping to mitigate climate change, and air purification, enhancing air quality. Moreover, they serve as vital habitats for numerous species, supporting biodiversity and maintaining ecosystem stability. Conserving these trees is not only key to preserving ecological balance but also to fostering community engagement in environmental protection efforts.

Through the Lousada Sustainable Environmental and Research Fund, the Municipality of Lousada financed the Green Giants project in 2017, with the goals of "Knowing, Engaging, and Valuing" these important trees. As part of the project, 7,400 of these giants were inventoried, with around half being fully characterized. Remarkably, the study revealed that these trees sequester an average of 50 kg of carbon per year and store over 1,500 kg of carbon.

However, the project also found that nearly 6% of these trees were being killed annually, primarily because they represented financial burdens with no direct return for their owners. The project founder was thus tasked with finding a solution to halt this deforestation.

At the time, the concept of ecosystem services was gaining popularity. Ecosystem services refer to the various benefits that humans derive from natural processes, encompassing both material goods and intangible services. The concept emerged from the need to quantify, evaluate, and assign value to these benefits. These services can be divided into three categories: Provisioning services (e.g.,

food and raw materials extracted from ecosystems), Regulating and maintenance services (e.g., climate regulation and water purification), and Cultural services (e.g., recreation and spiritual value). By establishing clear criteria and indicators, this methodology allows for the assignment of economic value to ecosystem services, which highlights their importance to both society and the economy

The initial idea to address the deforestation issue was through carbon trading markets, which allow landowners to sell carbon credits for forest preservation or reforestation. However, this system currently applies only to new forestation projects and does not account for the value of existing trees, despite their demonstrated importance

As a result, VERDE was founded to embark on the innovative task of developing a new carbon credit methodology, aimed specifically at valuing these ancient trees. While this process is time-consuming, to act more quickly, the association implemented the Payment for Ecosystem Services (PES) model. Through its Carbono Biodiverso initiative, VERDE collects funds from companies and individuals seeking to offset their carbon footprint and pays tree owners an annual fee, in exchange for their co mmitment to preserving the trees in good condition. The association also assists in managing the trees and revitalizing adjacent land, exploring agroforestry as a way to make forests profitable through non-timber products, thus maintaining their ecological value.

The Carbono Biodiverso project has been well-received by companies and funding entities and is beginning to overcome the skepticism of the first landowners signing contracts to protect trees. VERDE's young and multidisciplinary team has successfully attracted many volunteers to Lousada, supporting the municipality's environmental restoration efforts in exchange for equipment resources, creating a fruitful partnership for the common good.

Discussions and main conclusions

The participants collectively discussed how the founder of VERDE and other young scientists were attracted to Lousada from various parts of the country through the Lousada Sustainable Environmental and Research Fund, and how this initiative was a great idea. It was noted that the investment in funding versus the return in high-quality data collected through the initiative is highly beneficial. Many of these young professionals eventually stay and secure green jobs within the municipality, renting homes, shopping locally, and contributing to the town's life. In fact, Lousada is one of the youngest municipalities in the country.

Many were also surprised by the lack of legislation in Portugal protecting large trees, while countries like Spain and Cyprus have recognized some of these gaps. Nevertheless, the municipality's effort to award the project was highly praised.

Several questions arose about ecosystem services and the current legislative state, all of which were promptly answered by the VERDE representative. The ingenuity of the Carbono Biodiverso solution was commended, though questions were raised regarding the approach to stakeholders. It was explained that companies with environmental concerns are already sensitive to carbon offsetting. Since most market solutions are based in the Americas or Africa, these companies are pleased to support national initiatives they can monitor more closely. Additionally, their financial contribution is offset by the marketing benefits they gain with clients who share similar values. Some companies even learn about VERDE's restoration initiatives and join the cause as volunteers.

However, with rural, elderly landowners, a more delicate and time-consuming approach was needed. Initially, they were suspicious of the monetary offer and co-management proposal, which simply aimed to preserve the trees rather than cut them down. The biologist explained that it was crucial to engage local influencers, such as parish presidents or priests, who vouched for the initiative and helped build trust among landowners. Once that trust was established, landowners were very satisfied with the support in maintaining and improving their lands and trees.

The main takeaways from this synergy were the importance of creating partnerships with local NGOs and attracting qualified professionals to rural regions. The interdisciplinary nature of the team was also a key success factor, as this innovative idea challenged everyone to think about how ecosystem services can bring value to their territories.

References

What is Biodiverse Carbon? | VERDE Associação. (n.d.). VERDE Associação.

https://www.verde-associacao.pt/en/carbono-biodiverso

Field Study Visit
Module 5:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Land water management and sustainable reuse of built heritage

Claudia Vanessa Silva

Visit Details

Institution

Molinological and Forest Park of Sousa

Contact

paisagemprotegida@cm-lousada.pt, +351 255 820 500

Type of participants

Public officers/technicians, Councillors, Environmental project or department coordinators, Consultants who advise local governance

Date

Tuesday, 20 February 2024

Location

Lousada, Portugal

Report

Goals of the visit

This visit aimed to showcase the strategic acquisition of land by the municipality, which is being developed to improve the region's ecological and energy efficiency, safeguard historical natural and cultural values, and mitigate climate change impacts.

Short-Programme

The municipality's sustainability strategy and land acquisition; River intervention; Restoration of historical buildings and renewable energy; Cultural values.

Description

Lousada's green revolution began quietly in 2014, when Manuel Nunes, an archaeologist and professor with a deep love for his homeland, was newly elected as the municipal councilor for the environment. He approached the University of Aveiro in search of academic expertise to develop something unprecedented in the country: Lousada's Municipal Sustainability Plan. Leading the initiative was Dr. Milene Matos, a biologist with a PhD and a background in marketing and digital communication. She based the plan on five key pillars: Research and Nature Conservation, Environmental Education and Scientific Literacy, Social Engagement, Infrastructure Efficiency, and Internal Sustainability. To her surprise, the first biodiversity survey revealed that the region housed critically endangered species, which was unexpected given the area's industrial-agricultural-rural landscape.

One of the key identified areas was a 6-hectare plot where the Sousa River crosses agricultural lands, encompassing seven mills, a hydraulic sawmill, a miller's house, and three dams, all bordered by a beautiful oak forest. The river regularly overflowed, causing significant damage. Therefore, the first action involved the renaturalization of the Sousa River and the creation of infiltration zones along its banks. The riverbanks were softened and reshaped naturally, and a large pond was built to control flooding. This pond acts as a "sponge," storing water during heavy rain, replenishing aquifers, and helping prevent soil erosion. The pond has also become a carbon sink, contributing to water purification and providing a habitat for amphibians and dragonflies, which are natural pest controllers.

Deadwood fences and amphitheaters were installed as environmental education tools and biodiversity-promoting structures. Additionally, the riparian galleries were restored, leading to an

increase in wildlife diversity. Local residents were pleased, using the area for leisurely walks and picnics.

Despite these efforts, the vernacular heritage of the mills remained underutilized, as only one mill was operational. The municipality partnered with the local miller to open the mill to visitors. For the other mills, an innovative idea was born: the creation of the Pias Molinological Park. With a budget of about one million euros, the project is located within the Sousa Superior Local Protected Landscape, a region covering more than 20% of Lousada, another achievement of the current administration.

The Pias intervention aims to renovate the existing spaces, transforming them into innovative environmental, cultural, and educational facilities. The restored Moinhos de Pias complex will house educational spaces dedicated to the biodiversity of the Sousa
River, the archaeology of flour production in Lousada, and the geology of the Sousa Valley. Additionally, the project will feature training in traditional arts related to milling and bread-making, including a Miller's Workshop, an Artisanal Grinding Factory, and a Traditional Bread Lab.

Finally, to ensure the project's energy neutrality, the Pias Molinological Park will be powered exclusively by microturbines installed in the foundations of the old water mills, generating clean energy.

Discussions and main conclusions

The group was initially struck by the impressive size of the implemented pond. It was explained that this larger project was only undertaken after the team had developed sufficient technical expertise from working on smaller, sealed ponds spread across the territory. This pond, however, required the use of heavy machinery and was deliberately left unsealed to perform its role as a natural "sponge," allowing excess water to infiltrate and recharge aquifers during periods of heavy rainfall. This design helps prevent downstream flooding by regulating the river's flow. Additionally, the team minimized disruption by introducing select aquatic plant species that quickly established themselves, facilitating natural colonization. Before long, amphibians, birds, and small mammals also began utilizing the habitat, showcasing the rapid ecological benefits of the pond.

The next point of interest was the landscape in which this park is situated, the Sousa Superior Local Protected Landscape. Participants remarked that typically, such protected areas are designated by higher levels of government, and they were curious how a municipality managed to create this tool for local land management. It was explained that because this designation involved some restrictions on land use, the municipality had to approach the issue delicately. Community

engagement was crucial, so a series of participatory sessions were organized in all affected parishes. The regulation framework was developed in parallel with ongoing community consultations, ensuring that local residents understood the advantages of the initiative and supported its implementation. By involving the community from the start, the municipality succeeded in creating a management model that balanced ecological needs with local interests.

The participants also commended the innovative idea of repurposing the old mills for modern uses. They were enthusiastic about how this project would blend traditional values, art, native cereals, and cultural activities, effectively breathing new life into historical structures. The decision to install microturbines to harness water energy, even though the mills will no longer grind flour, was particularly praised. This ingenious solution not only honors the historical significance of the site but also aligns with contemporary sustainability goals. The group reflected on how, in their own regions, historical buildings have often been converted solely into museum-like spaces, which tend to lose community engagement over time. In contrast, they agreed that adapting such heritage sites to serve current community needs and interests—such as is planned for this project—ensures they remain relevant and actively utilized

Finally, the discussions reinforced the critical importance of having qualified professionals in the region to assess the value of natural spaces and assist in strategic decision-making. These experts play a key role in determining where to allocate funds and resources, ensuring that projects like this align with the three pillars of sustainable development: environmental protection, social inclusivity, and economic viability. Participants recognized that it is not just about conserving the past, but also about building a future where historical, cultural, and ecological assets can coexist in ways that support both the community and the environment. The need for interdisciplinary collaboration—between ecologists, architects, historians, and community leaders—was emphasized as essential for the long-term success of such initiatives.

This elaboration underscores the importance of community involvement, thoughtful land management, and the integration of historical and ecological sustainability in modern urban planning

References

Parque Molinológico e Florestal do Sousa. (n.d.).
https://www.sousasuperior.pt/destinations/parque-molinologico-e-florestal-de-pias/

Organic and biodynamic agriculture

Claudia Vanessa Silva

Visit Details

Institution

Terra Com'Vida Farm

Contact

blandina.sousa1989@gmail.com, +351 917 002 800

Type of participants

Public officers/technicians, Councillors, Environmental project or department coordinators, Consultants who advise local governance

Date

Tuesday, 20 February 2024

Location

Lousada, Portugal

Report

Goals of the visit

The purpose of this visit was not only to showcase how a young couple, recently settled in the area, started a sustainable farming enterprise with the support of local rural development organizations, but also to highlight the innovative techniques they apply on their farm, which represent the future we should aspire to in our approach to food production.

Short-programme

How the project began; Challenges and Opportunities; Prove Basket Initiative; Best practices in sustainable farming; Community engagement and validation.

Description

Blandina and Pedro Sousa were a young urban couple with careers in the sports industry. When the time came to expand their family, the urban environment no longer felt suitable, and they sought a lifestyle that offered more peace and a closer connection to nature. The proximity to family led them to Lousada, where they made it their mission to provide people with organic, pure, and flavorful food, all while respecting nature and its surroundings.

With no prior experience in agriculture, they embarked on a journey of learning, not only through books but also by spending time with more experienced farmers who shared their philosophy. They exchanged ideas, as well as seeds from ancient varieties—often less perfect in terms of appearance and commercial value but far more nutritious and flavorful. The land they began working on had previously been used for monocultures, so their initial attempts, coupled with their lack of experience, were met with limited success. They had to experiment further, gradually enriching the soil with legume crops and organic manure, which they sourced from their neighbors. They even started a vermiculture project on their farm to help break down green waste and nourish the soil. Chickens also played a role, fertilizing, controlling pests, and aerating the soil in ingeniously designed mobile fences, rotating across different plots of land.

Thus, TERRA COM' VIDA was born in October 2020, from the perfect blend of family and land, combining Organic Farming, Biodynamics, and Permaculture principles.

Their initial idea was to sell directly to the local community, offering only seasonal products, freshly harvested to retain all their flavor and quality. However, because the area was rural, where even those without land had easy access to someone growing vegetables, and due to the unfamiliarity with organic and biodynamic farming practices, as well as the limited network of the newly arrived couple, customers were few and did not immediately see the added value of these products.

It was at this point that they connected with Ader-Sousa, the local Rural Development Association of the Sousa region, which managed the PROVE project locally. PROVE – Promoting and Selling is a methodology designed to help local producers distribute their goods by fostering close relationships between producers and consumers, establishing short supply chains. Using ICT tools, consumers can subscribe to weekly or biweekly baskets filled with a variety of high-quality,

handpicked fruits and vegetables. Through this new platform, TERRA COM' VIDA gained more exposure and support from association experts, who provided soil analysis and consulting on how to diversify their product offerings, control pests, and increase production while staying true to their values.

Acquiring a greenhouse was a decisive step in reaching their goals, alongside improvements in their farming techniques. Over two years later, the couple is now independent of the PROVE project but has retained many valuable lessons and continues to use the basket method.

Participants of the visit had the pleasure of seeing permaculture techniques that assist in their organic and biodynamic farming, such as:

- *Companion Planting: Growing different plants together to support each other by improving soil health, repelling pests, or providing shade. A traditional example is the "Three Sisters" system—corn, beans, and squash.*
- *Polyculture: Cultivating a variety of crops together, increasing biodiversity, improving soil fertility, and reducing vulnerability to pests and diseases.*
- *No-till Farming: Avoiding soil disturbance by not tilling, preserving soil structure, preventing erosion, and maintaining essential microbial life.*
- *Keyline Design: A land management technique that optimizes water distribution on sloped land, using the natural contours to direct water where it's most needed.*
- *Food Forests: Mimicking natural forests by planting layers of vegetation, including trees, shrubs, herbs, and ground cover, creating a self-sustaining system for food and timber.*
- *Composting: Recycling organic waste into nutrient-rich compost, improving soil health and fertility.*
- *Mulching: Covering the soil with organic materials like straw or wood chips to reduce evaporation, suppress weeds, and add nutrients as it breaks down.*
- *Animal Integration: Incorporating animals like chickens, worms, and pigs into the farming system for pest control, fertilization, and land management.*

At the end, several participants were eager to purchase product baskets, which, as always, were freshly harvested on the spot and paid for directly, contributing to the local economy.

Discussions and main conclusions

The visit to Terra Com' Vida offered participants a firsthand look at how sustainable, biodynamic, and permaculture principles can reshape both a farm and a community's view on agriculture. Various discussions emerged throughout, one of the earliest revolving around Blandina and Pedro's

decision to leave their urban lives and embark on farming in a rural setting. Participants admired their willingness to make such a drastic shift and pursue a more nature-connected lifestyle. This sparked discussions on the importance of reconnecting with nature and seeking balance in a world often driven by urbanization and fast-paced living.

A significant point of discussion was the value of learning from local farmers. Blandina and Pedro, despite having no prior agricultural experience, learned from experienced farmers in the area. The participants emphasized how these knowledge exchanges, particularly in sharing seeds and traditional techniques, were critical to preserving both biodiversity and sustainable practices. This connection with local farmers was seen as essential for fostering a community-oriented approach to agriculture

Another topic that generated interest was the couple's challenges in regenerating soil previously used for monoculture farming. Their journey of experimenting with organic manure, vermiculture, and crop rotation resonated with many, some of whom had faced similar obstacles in their own farming endeavors. The group discussed how soil health restoration takes time and persistence, and how organic methods, while slower, provide long-term ecological and economic benefits.

The introduction of the PROVE project, which connects small farmers to consumers through short supply chains, led to a discussion on how to strengthen direct relationships between producers and consumers. Many agreed that initiatives like PROVE help small farmers find their market while fostering community ties and promoting sustainable consumption. Participants also noted that community-based programs can offer valuable exposure for new farmers who need support in their early stages.

Participants were particularly impressed with the permaculture techniques on display, recognizing their potential for boosting productivity while maintaining ecological balance. They wondered if local workshops on the topic would promote this practice amongst other farmers.

The couple's investment in a greenhouse became another topic of reflection, as it allowed them to extend their growing season and diversify their product range. The group agreed that such infrastructure is crucial for small farms aiming to maintain productivity without compromising sustainability. Many noted that accessible funding for infrastructure is key to supporting small-scale farmers as they expand.

Toward the end of the visit, participants discussed the benefits of direct sales between Terra Com' Vida and its consumers, particularly through fresh produce baskets. The group appreciated how such direct relationships not only support the local economy but also foster a stronger connection between consumers and the source of their food. Some visitors were motivated to explore similar models in their own communities.

In conclusion, the visit to Terra Com' Vida provided a wealth of inspiration and learning. Participants left with a deeper understanding of the challenges and rewards of sustainable farming, the importance of community engagement, and the potential of permaculture to reshape agriculture. Many were inspired to implement similar practices and approaches in their own regions, recognizing that small-scale farming, when rooted in sustainability, can create a more resilient and connected future for rural areas.

References

Ader-Sousa. (2024, June 14). Prove - Ader-Sousa. https://www.adersousa.pt/projetosader-sousa/prove/

Τερρα Ψομ Ωιδα. *(ν.δ.-ψ). https://www.facebook.com/p/Terra-Com-Vida-100064872913049/?paipv=0&eav=AfYcbY6VquwPOzIXjxQXaBBsHlbe3irdBV_S3xnTsc4WUjwzjb2uP_XDbk_-6ca0r84&_rdr*

Field Study Visit
Module 6:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Public transportation in Belgium

Bart Van Santvliet & Tim Chabot

Visit Details

Institution

Vervoersregio Antwerpen en mobiliteit in Zoersel

Contact

MOW Flanders:

Filip Boelaert: filip.boelaert@mow.vlaanderen.be

Type of participants *Aldermen*

Public officers/technicians

Mobility advisors

Mobilitiy project or department coordinators

Consultants working for/advising the local government

Type of stakeholders that participated in the visit (mayors, water technicians,...)

Date

4 october 2023

Location

Belgium - Antwerpen - Zoersel

Report

Goals of the visit

During the training, mobility in Belgium was explained by the transport region of Antwerp. This framed the global strategy at the Flemish level, then the strategy of the transport region of Antwerp and then also the local strategy in Zoersel.

In Belgium, the system is relatively complex.

The local mobility plan of the municipality of Zoersel was also explained and how this was framed within the broader picture of the transport region and mobility at the Flemish level.

Short-programme

During the visit the car was not used for our transport. Each participant received a bicycle from the company 'Donkey Republic' and otherwise public transport was used. An electric sharing car was also at our disposal should we need to use it, but it was not necessary

Description

From the Flemish level and the various transport regions, efforts are being made to draw a number of red, major threads through the country, on which a smooth connection of public transport is centrally ensured. This can be done by train transport, buses or streetcars, for example.

This creates a smooth connection if you live near the major, red wires.

To encourage further mobility, efforts are made at the local level at hoppin points along major routes. This results in a great mobility network if citizens are open to part-mobility and combine different modes of transportation

For the combination of transportation modes, the STOP principle is also considered.

Steps, Stairs, Public Transport, Private Transport.

This means that for those users who live close to a stop or other modes of transportation (public bus, streetcar, train) can move on foot to the stop.

If the distance is too great, they can use bicycles (stairs), and combine this with the bus.

For the relocation in Zoersel, Donkey Republic electric share bikes were used. In this way, either the electric shared bikes or public transport (the bus) was used for each visit.

Only for the visit to Camp C was a private bus used, as there was no easy connection to the site. This mobility was still the most sustainable solution, as all participants took one bus together.

A bicycle tour through the municipality of Zoersel was organized with the electric share bikes. Several sustainable, energy-efficient projects in the municipality were highlighted, and the local mobility strategy was explained.

Sustainable, energy-efficient projects:

- *New residential district with emphasis on nature (green verges and squares), water (canals), solar panels, heat pumps*
- *Old neighborhood in 'project Bloemenwijk'.*
- *'t Boshuisje: Newly renovated building with historical value*

Mobility:

- *School children riding bikes with fluorescent vest*
- *Bicycle streets around schools: Bicycle is king*
- *Slow roads as connecting roads and alternative routes for busier connecting roads within the municipality*
- *Separate bike lanes off the road*
- *Share cars at the town hall*

Discussions and main conclusions

In general, in europe, the car is still king. Important conditions that emerged during the stay for using the stop principle are

Maintaining and creating good infrastructure that makes it easy to get around. Drafting a mobility plan is indispensable here, so that people can pull together with a clear vision from all different parties on the same sail.

Discourage the car: by taking away space for the car, people will use other means of transportation that are easier than the car.

For the implementation of the mobility plan, it is important to build support among citizens and politicians. There is no consensus on the best way to do this, but it is believed that through participatory processes in which citizens are given a say, support is increased. However, this process may encounter resistance from citizens, making implementation of the plan difficult.

Another way is to implement the plan and ask for feedback after citizens have experienced the effects. Because citizens are already experiencing the results, this usually gives better results.

Mobility is organized at different levels, coordination between these different levels is important. If one wants to commit to the use of different means of transportation (hop on hop off principle), it is necessary to coordinate the sharing options of different providers. In other words, one should not need 20 different aps for switching between different transportation options.

Cooperation between different service providers (De Lijn, NMBS, etc.) is also very important.

The transition of mobility is a change in mentality, therefore it is important to get children involved from an early age, for example, implementing some kind of driving test of children is important.

Bicycles are an expensive investment, children grow so bicycles need to be replaced on a regular basis. a bicycle library where children can borrow bicycles and change to a larger size can provide relief here.

References

Gemeente Zoersel. Mobiliteitsplan. mobiliteitsplan | gemeente & ocmw Zoersel

Vlaanderen. Vervoerregio Antwerpen. Vervoerregio Antwerpen | Vlaanderen.be

Netwerk Duurzame Mobiliteit. STOP-principe. STOP-principe | Netwerk Duurzame Mobiliteit (duurzame-mobiliteit.be)

Gemeente Zoersel. Fietsuitleendienst velotheek Op Wielekes. fietsuitleendienst velotheek Op Wielekes | gemeente & ocmw Zoersel

Field Study Visit
Module 7:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Energetic neighbourhood renovation

Bart Van Santvliet & Tim Chabot

Visit Details Institution

Agfa Gevaert

Contact

Employée and volunteer from Energycitizens coöperative Zuidtrant:

Lenn Coussement: lenn.coussement@zuidtrant-w.be (employée)

Arnold Vanhove: arnold.vanhove@skynet.be (volunteer)

Type of participants

Aldermen

Public officers/technicians

Environmental advisors

Environmental project or department coordinators

Consultants working for/advising the local government

Type of stakeholders that participated in the visit (mayors, water technicians,...)

Dates

4 october 2023

Location

Mortsel - Agfa Gevaert and apartment building nearby one of the factories of Agfa Gevaert-, Belgium

Report

Goals of the visit

The purpose of the visit was to investigate and learn how a heat network can be established and how industry near a residential area can contribute to sustainable heating of buildings (citizens, companies, non-profit organizations, etc.) and reduce the CO2 emissions of an entire environment.

An entire residential neighborhood can benefit from the residual heat from Agfa Gevaert's furnaces, without extreme costs, and heat homes at a fixed rate, in an energyefficient and sustainable manner.

All this has been realized thanks to the collaboration of several citizens' cooperatives (Ecopower and ZuidtrAnt-W), the technical experts from Kelvin Solutions and Agfa Gevaert.

Short-programme

During the visit we saw the heat exchangers on the Agfa Gevaert site, the heat exchangers in the basement of an apartment building, and the explanations were given on the outside of the Agfa Gevaert site by a guide.

Description

During the training, energy was one of the topics. The different ways to move towards energy efficiency were discussed, including heat networks, energy transition through different cooperatives, renovation to make homes more sustainable, solar panels, wind turbines, ...

To further explain the concept of a heat grid, the visit to Agfa Gevaert's heat grid was organized.

This gave the participants the opportunity to see a renewed project and to check what is necessary to build such a grid in their own area.

From this it could be concluded that the setup was fairly limited in size, but still a very large exchangeable heat could be recovered from the furnaces (residual heat) for the immediate surroundings. Also the necessary modifications to the heating systems of the apartment building, were found to be very limited.

After this explanation, the history of Agfa Gevaerrt in Mortsel was explained and how the company was created and what steps were taken to start the heat network. This required willingness from local residents, the municipality, Agfa Gevaert management, citizen cooperatives and technical experts. The nearby recycling store (Opnieuw & Co), is also heated via this heat network.

This project sensibly utilizes unused waste heat from chimneys by capturing and transporting it. In the future, this can be expanded to include waste heat from cooling towers.

This avoids the use of fossil fuels and focuses on sustainable heating.

Discussions and main conclusions

Impressive to see the heat grid in reality, and on such a large scale.

The size of the necessary constructions are not too bad, they do not take up so much enormous space.

Not immediately possible to provide such a heat grid of industry everywhere. Not everywhere there is residual heat from production processes near homes or other buildings that could benefit from it.

Alternative sources to build out a heat grid are usually known on a smaller scale, but not yet so well known on a large scale. For example: waste heat from a heat plant, a nearby company with a lot of waste heat, biomass, solar collectors, heat pumps.

New, innovative way of heating.

Many conditions are necessary, especially it may be useful before putting this into practice.

References

Warmte verzilverd. Het project Warmte Verzilverd. Warmtenet | Warmte Verzilverd

Module 7:

Sustainable energy

Tim Chabot, Elise Goorden & Tine Vermeiren

Visit Details

Institution

Kamp C

Contact

sarah.verbeeck@kampc.be

Type of participants *Aldermen*

Public officers/technicians

Enviromental advisors

Environmental project or department coordinators

Consultants working for/advising the local government

Type of stakeholders that participated in the visit (mayors, water technicians,...)

Date

5 october 2023

Location

Britselaan 20, 2260 Westerlo, Belgium

Report

Goals of the visit

In the construction sector, a lot of CO2 is still emitted through the use of materials and the heating of buildings. Camp C looks at different climate neutral solutions.

Short-programme

After we arrived, we visited an experimental house where that different occupation techniques to make the house emit less CO^3 in production, as the emission of Co^2 when heating the homes This was a temporary exhibition and a temporary cohet nstruction where all of that fell together.

Afterwards we were given a tour of the permanent building, here we saw more permanent solutions for use in the home. There is a lot of emphasis on circular use of materials and spaces.

Description

In The Exploded View Beyond Building saw ⅓ products of today (innovations already available), 1/3 products of tomorrow (in the certification phase), and 1/3 products of the future (conceptual ideas).For example, we saw the use of reeds and mycelum for soundproofing materials and insulating materials. as well as materials made from recycled materials for insulation. It also looked at the different functions present in the house like how to recycle water in a climate-neutral way.

The Exploded View is also showcasing the endless, potential material streams available that are not yet being used in the construction world. For example, material streams from food, textiles, sewage water, buildings, or even from our own living environment. Through this experimental design, we share our research towards materials that can keep the production circle as small and as efficient as possible.

Above all, The Exploded View is a 'live research' and 'storytelling' installation. It is a model of a detached house in which we display various biobased materials and circular methods side by side. Through both the model and the life-size blueprint, we show all that we have discovered, as well as the parts that we are still missing-

In 2019, Kamp C organised a circular procurement process in preparation for the construction of Belgium's first circular building: 't Centrum. This building will integrate as many pillars of circular building as possible.

By offering a broad view on circular building and constructing the first circular building itself, Kamp C wants to get this innovative and sustainable way of building off the ground in Flanders. The pilot project around 't Centrum provides insights into the obstacles and solutions.

Almost all the materials were circular in design, they were used materials or materials that could be reused. For example, a wall was made of windows from a demolished house. Rainwater is stored on the roof that provides water for the whole building. The foundations are built to have minimal impact on the area and the building can easily be demolished to be built into something new. Heat comes from an underground borehole that brings heat to the surface. For air purification, as well as the ziuvering of grey water, a green wall is used. In short, there are many examples of how to green the building industry

Discussions and main conclusions

The whole site breathes innovation, there are very many possibilities that need to be looked at on the spot to see if they are feasible. for example, in The Exploded View Beyond Building, cork was used to make an ecological flower pot. this is material that is in stock in portugal. building materials also need to be looked at in this way.

These were very innovative ideas and pricipes, but often there are even easier wins in other areas. For instance, in spain, people are setting up an energy cooperative for solar panels to bring down the energy consumption of the home in an ecological way.

But circular construction, which looks at the entire life cycle of the building, is an important principle that people can already start working with when designing new buildings.

References

Kamp C. 't Centrum: Rondleiding in 't Centrum. 't Centrum - Kamp C: centrum voor duurzaamheid en innovatie in de Bouw

Kamp C. Exploded View Beyond Building. https://www.kampc.be/explodedview

Field Study
Visit Module 8:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Sustainable Water Management

Lawrence Sudlow and Ignacio Garcia

Visit Details

Institution
VTW and the Ayia Napa Municipality

Contact
n/a

Type of participants
Technical personnel from VTW

Civil servants from local administrations (partners)

Environmental specialists (partners)

Consultants working for/advising local government

Date
26th April 2023

Location
Ayia Napa, Cyprus

Report

Background

Ayia Napa sea port as well as Nissi beach was contaminated with TPH (Total Petroleum Hydrocarbons) and associated pathogen microorganisms. This was caused by the heavy movement of boats entering and exiting the port, and also motor and oil spills while refuelling their vessels, plus paints & solvents while the owners maintained their boats, as well as sewage contamination. It is safe to say that the high number of tourists during the summer periods also results in additional contamination caused by sewage contamination. The end result was a polluted port, with foggy waters, with increased toxic algae bloom and very little aquatic life. As for Nissi beach the water was filthier and full of seaweed which is repelling to the visitors.

Ayia Napa Municipality entrusted VTW to undertake both of these projects. Samples were collected at the weakest points with the least water circulation in the port plus at the surface water of the Nissi beach.

The results showed contamination of TPH and associated pathogen microorganisms. In just a period of 6 months VTW managed to achieve 99,48% reductions in the TPH levels, resulting in a significant drop of pollutants within the marine water column and restoration of aquatic life. As for Nissi beach the water became clear again and there were less seaweeds which made the beach attractive again for visitors.

Short-programme

Municipal water treatment plant built using public funding. It produces an annual average of about 2.2 million m³ recycled water. The total of all these quantities is available for irrigation. They mainly irrigate citrus, olive, potatoes, green areas and football fields. The water is stored in the tanks, which are mapped as one polygon. The biological value is classed as neutral. Recycled water is a resource which has been given an increased attention in recent years. The importance of this resource, which utilises great amounts of water which would otherwise be lost from the water balance, is particularly high. The supply of recycled water for irrigation via Governmental Water projects started in 1998, with a small amount of around 1.3 million m³. Today it reaches 12 million m³ for irrigation and 2.5 million m³ for enrichment. There is expected to be a big increase in the available quantities in the future.

Description

During the visit, the stakeholders in the group were very interested to see the board control room, the lab and the methodology used at the plant. It was interesting to discover that the company has

achieved zero waste, using the recycled water for irrigation and the sludge as a fertiliser. A good example of circular economy (even the water is sold)

The system is cost efficient as the water goes up by pumping but irrigation is by using gravity. The company is aiming to be energy independent in the future. Worth noting that the design of the plant takes into consideration the volume of waste expected when at full capacity during the high season to prevent problems. Noted that they do good data keeping and that the treatment is only organic and mechanical (no additives).

The facility is public but management is private with a 5 yrs contract, so good investment of public money (using the Public-Private Partnerships system).

Discussions and main conclusions

There is an ongoing project to transform sludge into compost worth 15€ million. At this moment it is already used as fertiliser in other parts of the island. Treated water (high quality after the 3rd treatment) is used for irrigation of green spaces at 17 cents or for agriculture at 7 cents (so there is an economic advantage too).

The project is considered to be pioneering in building the sewage and irrigation system at the same time, pumping the sewage up to the plant but using gravity to lead irrigation. Plant is built to maximum capacity (August 150,000 people as compared to 25,000 during the winter).

Planning to install photovoltaic panels to gain energy independence.

Public facilities but run by a private company, new contract every 5 years.

For over 10 years they have only added organic material, bacteria, etc.

There are no factories or heavy industry, so the waste is very high quality.

This system uses 0.6w of electricity per cubic meter of affluent. That's 40% of the cost of using the membrane system.

The funding for the extension of the project came from the EU (2yrs ago, the thermoblowers that send air to the oxygenation tanks which allows the reaction of microorganisms. This represents~60% of their costs in electricity). The plant was built 22 years ago: the government paid for the irrigation system and tertiary treatment and the rest was from local taxes

First treatment is physical, mechanical. Second is the aerobic process in the sludge pools. Third is the sedimentation pools.

They analyse the quality of the water that comes in to check for pollutants, midway through the process, and the one that goes out. Some every day, some 3x a week , some 2x a week.

References

Neocleus, N. (2018, May 11) OK

https://www.gwp.org/contentassets/aa500f6c8cb749d7ac324a4065395386/202.th e-cyprus-experience_neocleous.pdf

Water Framework Directive | Home page. (n.d.).

https://www.moa.gov.cy/moa/WDD/wfd.nsf/home_en/home_en?opendocument

Field Study Visit
Module 9:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Waste management

Lawrence Sudlow and Ignacio Garcia

Visit Details

Institution
Ayia Napa Municipality

Contact
Ayia Napa Municipality 25 Agias Mavris Str. P.C 30026, 5340 Ayia Napa

Type of participants
Representatives from the Ayia Napa Municipality

Civil servants from local administrations (partners)

Environmental specialists (partners)

Consultants working for/advising local government (partners)

Date
26th April 2023

Location
Ayia Napa, Cyprus

Report

Background

As mentioned in the Field Visit Report for Module 8, Ayia Napa has worked to reduce its waste contamination in the port and beach areas through a Comprehensive Water Treatment Project and that pollutants have been reduced considerably. The use of water and solids from the water treatment plant as irrigation and fertiliser have also helped to resolve some shortages of natural resources for farmers and gardeners across the island. However, other waste products (plastic, glass, paper, cans. etc.) need specific collection and processing systems that the municipality has to manage. Ayia Napa also has to manage the increased waste produced by the thousands of tourists that visit each year, especially in the summer months.

Short-programme

The Ayia Napa waste policy was explained by the vice-mayor.

Description

During the discussion with the Ayai Napa representatives, the stakeholders in the group asked about volumes and destinations of the different types of waste. The main challenge to the local authority is how to manage tourism in a sustainable way. Given the substantial increase in the population in the summer months, the management of waste in the municipality has to gear up to cope with the waste created by the thousands of tourists that visit the region every year. There is a recognition locally that tourism is positive for the economy but that it does pose a number of challenges. The representatives spoke about some initiatives to get the hotels and restaurants involved in the correct management of waste. They are even engaging with the major tour operators to get them on board, with incentives and regulations that will increase awareness and contribute to the overall management of waste. For example, the local authority has embarked on a programme of

distributing compressors to hotels that will reduce the volume of waste (mostly plastics, cans and packaging), therefore reducing the transport of the material (time, workers and CO2 emissions).

The global trend to be "Greener" helps when it comes to asking people to get involved with the reduction, removal and recycling of waste. Activities such as Beach Cleaning have been relatively successful and other initiatives to involve visitors to be responsible with their waste. The local authority is also implementing charges to hotels and restaurants (and other establishments) that do not adhere to the town's sustainable waste management plan. The question remains if some prefer to pay the charge rather than manage their waste correctly.

Discussions and main conclusions

The Ayia Napa representatives took questions from the group and expressed their desire to continue to improve their waste management policies. It appears that very little domestic composting is done and plastics and other residues that arrive by sea onto the beaches are a constant difficulty to manage.

References

n/a

Field Study Visit
Module 10:

GoGreen
LOCAL ACTION FOR EUROPEAN GREEN DEAL

Social participation, community bounding, environmental education

Jade Alves Gabiron

Visit Details

Institution

Westport Community Gardens

Contact

Website's form: https://www.westportcommunitygardens.org/contact-info

Type of participants

GoGreen LTTA4 participants

Community Gardens volunteers

Date

29/05/2024

Location

13 Hyde Lane, Westport Ct 06880, Ireland

Report

Goals of the visit

The purpose of the visit was to discover Westport's only community garden and to learn more about its initiatives as an example of grassroots organisation created by and for a local community. Themes such as social ethics, community boundary, community organisation and social organisation were touched upon, as well as biodiversity conservation, local knowledge transfer and environmental education. More than sensitising the participants, the visit aimed at spreading the struggle of the community gardens against the burgeoning industrialisation in Westport, and to stimulate debate and interest in ecological practices.

Short programme

The visit started at 2.15am with an introduction to the Westport Community Gardens team. Gemma gave the GoGreen partners a tour of the garden and the solar oven, and let the partners explore the rest of the space on their own. Everyone then gathered in the greenhouse to observe the community's diverse plantations.

Description

The visit began with an introduction to the special status of the Westport Community Gardens. In fact, they and the Long Lots Preserve are threatened by the construction of a multi-purpose sports field. But they are one of Westport's last lungs, protecting the surrounding area from intense flooding, noise and traffic. In addition, the gardens are ideally located close to Long Lots Primary School and are intended to improve the school while developing more educational activities with the pupils.

It could be argued that the Community Gardens were not only a community garden, but also a symbol of the earth's resistance to war. By bringing together different generations, different social backgrounds and different genders through this struggle, the Community Gardens have become a unique space in the local landscape.

Gemma then led the participants through the different parts of the garden. We stopped first at a solar oven, handmade by the garden community. Gemma patiently explained the intricate construction of what looks like a simple artefact. In fact, the community's first attempt collapsed because the materials were not adapted to the climatic conditions. Following this event, they re-evaluated the requirements of the stove, rebuilt it and are now able to use it regularly. Following this presentation, Gemma gave several examples of repair and construction techniques that

thecommunity has developed over the years. One of these was an electric bicycle, made entirely from used materials, that works without a lithium battery. This was an intergenerational collaboration between people who have known how to build and repair bikes for years and younger engineers who rethought the battery system. This project also involved the wider community, as the Westport Garden's Community did not originally have access to all the materials needed for such a design.

Gemma's colleague then explained the ecological management of the site. The gardens are located in a natural area that the community tries to keep as wild as possible. As such, the site is mainly made up of fallow land to maintain the natural biodiversity and fertility of the soil. It allows natural species to coexist, creating a unique environment close to the heart of the city. This brief explanation allowed us to take a closer look at the rich biodiversity that surrounded us as we enjoyed a free time in the garden. After a ten minute exploration, we all gathered around the greenhouse to hear Gemma and another colleague talk about seasonal farming. In the tiny greenhouse, the community gardens grow many different types of fruit and vegetables, which are later used by the volunteers, but also by the neighbours who used to collect their food there. As part of this activity, the community also offers gardening tips to visitors and a fair list of local recipes on their website to encourage local food consumption.

Discussions and main conclusions

Westport Community Gardens' visit gave the partners an opportunity to discuss several topics.

1. ***Social inclusion***

Although social inclusion is increasingly overlooked in ecological projects, its implementation can remain confusing for some. At Westport Community Gardens it is part of the identity of the place. All ages, cultures, ethnicities and abilities are welcome. The philosophy of the place, as Gemma explained to us, is to build a community from the resources available to it, including its members. The gardens are feminist, ecological and intersectional. The partners noted the originality of the place, but wondered how all these people could work together in harmony on some activities. As our hosts demonstrated during the visit, this place only exists today.

because it has been built by many hands, all with the same desire to create something together. All the volunteers come from different backgrounds and share their knowledge and experience. In this way, physical disabilities, language barriers and so on are overcome by the same common will to be part of this diverse community.

2. ***Knowledge transmission and sharing***

During the visit, the discussion paused for a moment on the importance and ways of sharing knowledge. There are many. Gemma referred to the gardening books that the community uses both to grow their own garden and to share with visitors, as well as the websites and YouTube videos they used to build their electric bike from scratch. She also highlighted the intergenerational initiatives that Westport Community Gardens is developing to preserve ancestral knowledge that would otherwise be lost. Participants reflected on the need to mix traditional and modern knowledge, formal and informal sources, but even more on the need to experiment and learn from unsuccessful attempts in order to find a collaborative and sustainable solution.

3. ***Maintenance of communitarian eco sites***

On a more practical note, the conversation turned to the maintenance of the site and, more importantly, the natural spaces it contains. Indeed, the Gardens include not only a garden, a greenhouse and various indoor and outdoor workshops, but also a large area of wild land. This is to protect the natural ecosystems that the community sees as 'Westport's last natural lung'. Its members have chosen to preserve as much natural land as possible to allow natural cycles to fertilise the soil and preserve this carbon sink as close to the city as possible.

4. ***Local resistance against capitalistic projects***

The last issue discussed by the participants is closely related to the previous one. Indeed, the Westport Community Gardens are threatened by the aforementioned industrial constructions. The very existence and perseverance of the community embodies the refusal to see concrete take over the earth. It is an act of resistance. However, these concerns remain rather niche for the majority of Westport residents. The community is struggling to be heard by the local authorities who have an economic interest in transforming the area, by the neighbours of the gardens themselves who would rather have access to a modern commodity than a natural space, and even more so by the stakeholders of the industrial project itself. This is not an isolate case, however, as many local projects like this one are threatened and face the same opposition... their own opposition ***.***

References

Westport Community Gardens. (n.d.). Westport Community Gardens. https://www.westportcommunitygardens.org/#modern-organic-thai

The Westport Library Resource Guides. (n.d.). https://westportlibrary.libguides.com/?b=s

EcoFarm. (n.d.). EcoFarm. https://www.eco-farm.org/

The Westport Library Resource Guides: Living a Clean Life: Lawn & Garden. (n.d.). https://westportlibrary.libguides.com/livingacleanlife/lawnandgarden

Presentation of Westport Tidy Towns Program

Jade Alves Gabiron

Visit Details Institution

Westport Tidy Towns

Contact

Facebook page: https://www.facebook.com/westporttidytowns/

Type of participants

GoGreen LLTA4 participants

Date

29/05/2024

Location

Westport, Co. Mayo, Ireland

Report

Goals of the visit

The 'main objectives' of this visit were to show a successful example of local and sustainable community involvement in the wake of a national initiative. As a result, this field visit addressed aspects such as: local adaptation of national strategies; stimulating and sustaining local community engagement; organising large and diverse groups of volunteers; and the conditions necessary to maintain a safe and clean living environment. Participants in the visit had the opportunity to observe a successful example of such practices, but also to question the local dynamics that promote social participation in Westport.

Short programme

The visit took place outside Westport House, where LTTA4 participants met volunteer and coordinator Eithne Larkin. She spent an hour introducing the organisation, the programmes and answering questions from the participants.

Description

As the visit was static, it will be described by its content. We met Eithne Larkin in front of Westport House, where participants formed a semicircle around Eithne, who proudly displayed the organisation's awards since 2001 on the yellow vest she was wearing.

Our host began by explaining the formation of the national initiative and its aims. The main focus of TidyTowns was to encourage communities to improve their local environment and make their area a better place to live, work and visit. It quickly took the form of a competition to develop a stimulating rivalry that would encourage more and more people and towns to get involved. Eithne later explained that the initiative had gained momentum in Ireland and attributed it to a desire to make the city more attractive to tourists, especially as Galway and the west coast already concentrated most of the tourist activity. She also highlighted the strong sense of Irish community in a city where, far from folkloric interpretations, living conditions are not always optimal. Whether it is the fickle weather or the economic hardships highlighted earlier in this training at the Irish Life Museum, community building has been shown to help people overcome the difficulties of daily life.

Westport also won the 2001, 2006 and 2008 editions of the competition. On the one hand, Eithne explained that the volunteers felt that the time they put in had a double impact on their living environment: it was visibly cleaner and their work was recognised by their peers. On the other hand, the volunteers' work is rewarded beyond their local community, and the time spent maintaining Westport has an indirect impact on the rest of Ireland. Volunteers not only gained pride in their work, but also a sense that they could do more, better, with more people. This is how the Westport organisation grew.

Later, Eithne explained how she and her colleagues manage a growing team of volunteers with diverse availability, skills and motivations. By May 2024, the organisation had gathered 500 volunteers. They are all allocated a time slot, a location and a team to work with on a regular basis.

Finally, TidyTows addressed the question of community engagement. To date, TidyTowns has mainly used traditional social media platforms to communicate with its team and the local community. They share recent clean-ups, partner initiatives, local best practice and national updates.

The field trip ended with a brief tour of the area by Ivana Connor from Leave No Trace.

Discussions and main conclusions

This field visit allowed partners to exchange about the following topics:

1. ***Creating community engagement.***

TidyTowns is an interesting example because it started at a very local level and then spread to the rest of Ireland. The GoGreen partners wondered what techniques and methods had been used to mobilise such an important community around waste management and urban cleanliness over time. Both the reward system and the very tangible results of the volunteers' work are key factors, according to our host. It touches directly on the motivations at the heart of individual commitment to the community. By taking part in the TidyTowns initiative, residents receive real recognition from both their local and wider communities. This not only reinforces their sense of usefulness and togetherness, but also helps them to participate in the dynamics of their local community. The national competition then rewards their work in a more objective way. Moreover, by cleaning their city, the volunteers are both the initiators and the beneficiaries of their action, creating complementary reward circuits.

2. ***Sustaining community engagement.***

This second question is directly related to the first. How have TidyTowns managed not only to maintain, but also to build on the community engagement that they initially created? The discussion built on our host's previous conclusion. This complex and multiple reward system, she said, is able to foster a will to progress, to develop, to do more, thanks to the very local and communitarian results of the volunteers' actions. TidyTows have been able to create different local communities on social media, to publicly value the work of their volunteers, but also to create local partnerships with other communities. This strengthens their base as they grow.

3. ***Articulating the national and local levels.***

So far we have been discussing the example of Westport, but the discussion also touched on the structure of TidyTowns. Indeed, like many organisations, they have to engage in the complex gymnastics of articulating local activities at a national level. They have done this by giving a great deal of autonomy to the local branches of the organisation, while regulating the rules of competition at the national level. In this way, each local group can act according to the specifics of its territory and community, while remaining under the umbrella of the national organisation. In fact, Eithne explained that the local communities do not need to communicate with each other, which allows them to focus on developing local initiatives while the national umbrella co-ordinates them when needed.

4. ***The right to a safe and clean environment.***

Participants in the visit also addressed a fundamental issue at the heart of TidyTowns' existence: access to a clean, healthy and sustainable environment for all. Recognised as a human right by the United Nations General Assembly in July 2022, what may be a given for some is far from a reality for others. The discussion drew a comparison between the favourable situation of most of Ireland and places where families struggle every day to access it. TidyTowns is therefore a reminder that you can and must give life to the fundamental rights you enjoy on a daily basis.

5. ***Nature conservation vs city conservation.***

On a lighter note, the discussion touched on the differences between nature conservation and urban conservation, which is much less commonly addressed. This may be due to an anthropic, albeit ecologist, vision of nature as a defenceless being that humanity must protect, whereas cities would be their opposite: an artefact created for and by humans whose survival depends on it. Beyond this philosophical consideration, it must also be noted that both technical and legal mechanisms aimed at preserving these (eco)systems are radically different in nature and means, and sometimes incompatible.

In summary, this encounter with Westport TidyTowns allowed participants to address issues ranging from community engagement and organisational issues to nature conservation and human rights. These issues can be seen as reflecting the transversal nature of successful and sustainable community projects.

References

Corcoran, S. (2008, July 31). A culture of volunteering. Irish Independent. https://www.independent.ie/life/a-culture-of-volunteering/26465828.html

International Institute for Sustainable Development. (2024, July 12). UNGA recognizes human right to clean, healthy, and sustainable environment. SDG Knowledge Hub. https://sdg.iisd.org/news/unga-recognizes-human-right-to-clean-healthy-andsustainable-environment/

Volunteer Motivation and reward Preference: An - ProQuest. (n.d.). https://www.proquest.com/docview/854058155?sourcetype=Scholarly%20Journals

Westport Tidy Towns - Facebook page. (n.d.). https://www.facebook.com/westporttidytowns/

SuperValu TidyTowns Awards - 2023 - Tidy Towns. (2024, March 23). Tidy Towns. https://www.tidytowns.ie/