



HAROKOPIO UNIVERSITY OF ATHENS

SCHOOL OF ENVIRONMENT, GEOGRAPHY & APPLIED ECONOMICS

Department of Economics and Sustainable Development

ERASMUS COURSE: **THEMES IN SUSTAINABLE DEVELOPMENT**

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10th Lecture:

SDG 12: Responsible Consumption and Production

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LECTURE CONTENTS

01

INTRODUCTION

02

DESCRIPTION OF SDG 12 (WASTE AND WASTE MANAGEMENT)

03

DESCRIPTION OF CURRENT SITUATION - PROBLEMS

04

POLICIES AND ACTIONS – EUROPEAN UNION FUNDING

05

POLICIES AND ACTIONS / PROJECTS OF GREECE TO ACHIEVE THE GOAL

06

POLICIES AND ACTIONS / PROJECTS OF LOCAL GOVERNMENTS TO ACHIEVE THE GOAL

07

SUGGESTIONS FOR INDIVIDUAL ACTIONS TO ACHIEVE THE GOAL

08

CONCLUSIONS

INTRODUCTION

One of the most serious problems facing humanity today is sustainable production and consumption, as huge amounts of waste are generated: →

- food and garden waste, construction and demolition waste, mining waste, industrial waste,
- liquid waste, old waste cars, batteries, plastic bags, paper, sanitary waste,
- old clothes and old furniture etc.

The amount of waste generated is closely linked to consumption and production patterns.

The degradation of the soil with the decrease in its fertility and the loss of biodiversity from overproduction, the unsustainable use of renewable and non-renewable resources, the over-consumption and food waste contribute to the critical condition of our planet.



SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION 	14 LIFE BELOW WATER 	15 LIFE ON LAND 	16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



2.
DESCRIPTION OF OBJECTIVE 12
(WASTE AND WASTE MANAGEMENT)

Sub-goals (by 2030):

- Per capita global food waste will be halved at the retail and consumer levels
- Food losses along production and supply chains will be reduced.
- Achieve environmentally sound management of chemicals and all wastes throughout their life cycle
- Significantly reduce their release into the air, water, and soil
- Reducing waste generation through prevention, reduction, recycling, and reuse.



Directive 2008/98/EC:

"Waste means any substance or object which the holder discards or intends or is required to discard."

Based on their physical state:

- Liquid waste
- Solid waste
- Gaseous waste



**Waste Framework Directive
2008/98/EC**

Main requirements



Waste producer:

- any person whose activities generate waste
- any person involved in pre-processing, mixing, or other operations that alter the nature or composition of the waste

Waste holder:

- the producer or the natural/legal person possessing the waste.



Solid waste management refers to:

- handling waste in a manner that is safe for both:
 - the environment
 - the public

The main objectives of waste management are:

- to protect human health
- to protect the environment
- to conserve resources



Therefore,

"**Waste management** means the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites"



European Waste Code (EWC)

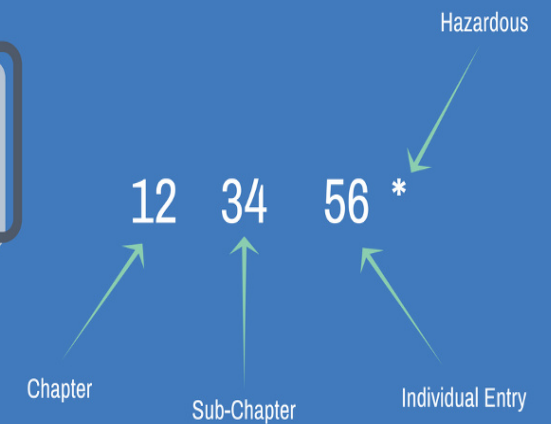
classifies waste by its origin and its risk to human health and the environment:

- Inert waste
- Hazardous waste
- Non-hazardous waste

What is an EWC Code?



What is a European Waste Catalogue Code?



Main principles of waste policy include:

- The principle of health and environmental protection.
- The waste hierarchy principle.
- The proximity principle (disposal close to the point of generation).
- The producer responsibility principle.
- The life-cycle principle.
- The precautionary and remediation principles



The fundamental goals of waste management are:

1. Waste prevention,
2. Recovery (recycling and secondary raw material or energy production),
3. Safe disposal of non-recoverable waste.

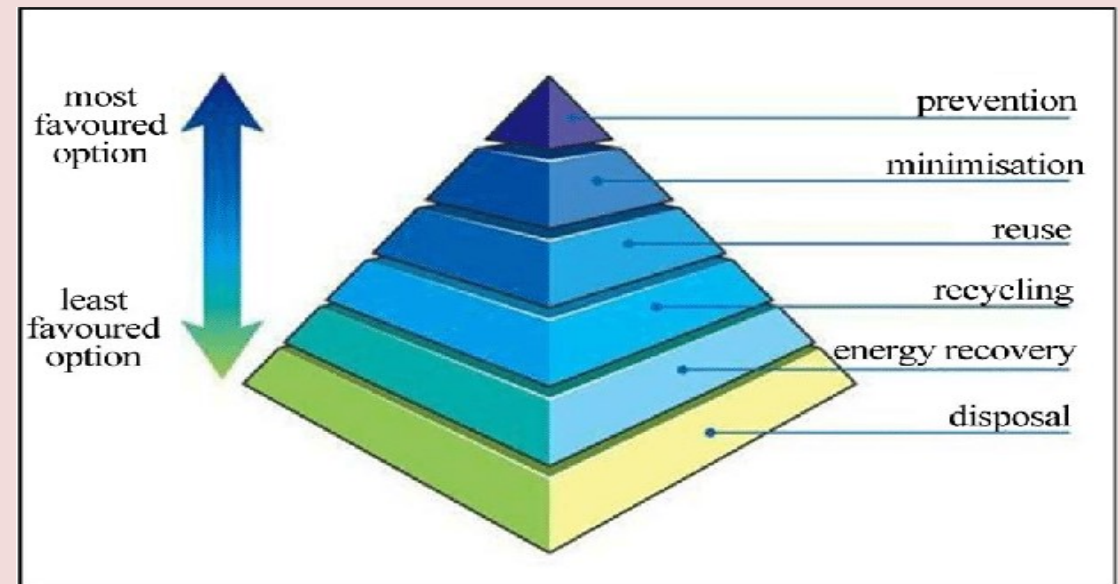
The waste hierarchy,

evaluates actions from most to least favourable regarding resource and energy use (see diagram)

It aims to maximize the practical benefits of products and minimize waste generation

Proper application of the waste hierarchy can contribute to:

- reduced greenhouse gas emissions
- less pollution
- energy savings
- conservation of resources
- job creation
- and green innovation



3.
DESCRIPTION OF CURRENT SITUATION - PROBLEMS

- Annual waste generation worldwide is projected to reach 3.4 billion tonnes within the next 30 years, up from 2.01 billion tonnes in 2016

- High-income countries, although comprising only 16% of the global population, generate over one-third (34%) of the world's waste

- The East Asia and Pacific region is responsible for nearly one-quarter (23%) of total waste

- By 2050, waste generation in Sub-Saharan Africa will triple

- In South Asia, it will double



At the same time, waste management and disposal practices have significant environmental implications:

- landfilling (which pollutes the air, water, and soil)
- Incineration (which causes atmospheric emissions e.g. methane)

Once waste is collected, it is transported and processed

- releasing carbon dioxide
- other air pollutants, including particulate matter

It is estimated that 1.6 billion tonnes of CO₂-equivalent emissions were generated globally in 2016 from waste treatment and disposal—approximately 5% of total global emissions.





Laura Tuck

former Vice President for Sustainable Development
at the World Bank, aptly stated:

"Poor waste management harms human health and the local environment, contributing to the climate challenge. Unfortunately, the poorest in society are often the most adversely affected by inadequate waste management. However, it does not have to be this way. Our resources must be used and reused continually so they do not end up in landfills."

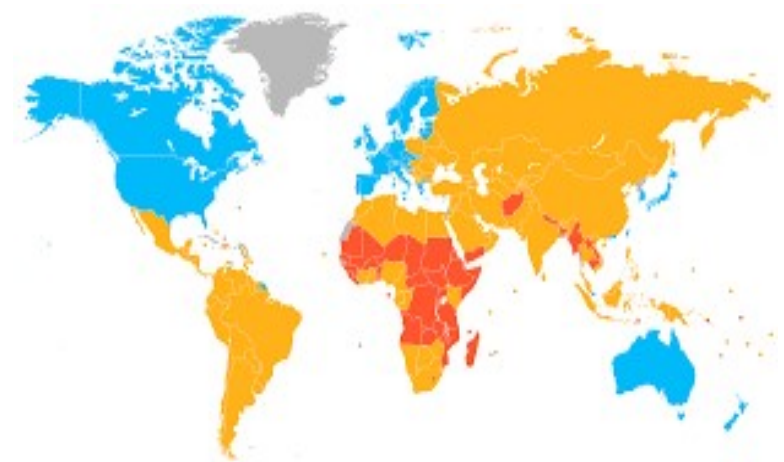
Waste management is critical to :

- developing sustainable
- healthy, inclusive cities and communities

but, it remains overlooked, particularly in low-income countries

Over one-third of waste is recovered through recycling and composting in high-income nations

Only 4% of waste is recycled in low-income countries



Supporting countries is critical:

- Providing funding to countries most in need
- Supporting large waste-producing regions in reducing plastic and marine litter
- Food waste is reduced through consumer education, organic waste management, and coordinated programs

Since 2000, the World Bank has committed over \$4.7 billion to more than 340 solid waste management projects across the globe



- The overarching aim of waste management policies is:
- to mitigate waste's environmental and health impacts
 - to improve resource efficiency



- The long-term objective is:
- to reduce waste generation
 - to promote waste as a resource
 - to achieve higher levels of recycling
 - to ensure safe final disposal



4.
POLICIES AND ACTIONS – EUROPEAN UNION FUNDING



In 2015, the European Commission adopted the Circular Economy Action Plan, establishing a long-term strategic framework to:

- promote waste prevention
- increase recycling and reuse
- reduce landfilling and incineration
- assist businesses, citizens, and public authorities in benefiting from the transition to a greener and more resilient economy

The circular economy seeks to "close the loop" of product life cycles by maintaining the value of resources within the economy. This contributes to:

- the better use of raw materials, products, waste
- the achievement of the environmental and climate objectives of the European Union (EU)
- the strengthening of local and regional development.

Waste prevention, eco-design, and similar practices:

- ➔ save resources,
- ➔ increase turnover
- ➔ create local jobs

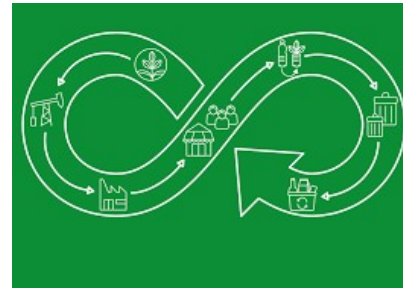
The cornerstone of circular economy implementation is:

- The EU Cohesion Policy
- The 2014–2020 investment framework, which allocated substantial resources to waste management, resource efficiency, and low-carbon investments.

EU investments are tailored to local needs and opportunities and have supported:

- Greater recycling capacity
- Improved waste management systems
- Resource and energy efficiency
- Strengthening of the bio-economy
- Innovative product design solutions
- New business models and
- Creation of green jobs





During the previous period 2014–2020, the EU allocated approximately €4.3 billion to actions focused on waste prevention, reuse, and recycling.

In less-developed regions, investments targeted critical infrastructure for waste treatment, resulting in an additional 4.5 million tonnes/year of recycling capacity.

Furthermore, €1.5 billion was invested in green production and resource-efficient processes for Small and Medium-sized Enterprises (SMEs).

The circular economy package also promotes water reuse.

Many EU regions already recycle treated wastewater for park irrigation, street cleaning, or groundwater replenishment.

Directive 2018/851 EU stated the aim of:

- increasing the targets for the reuse and recycling of municipal waste to at least 55% by weight by 2025 and to 65% by weight by 2035
- limiting the share of municipal waste sent to landfills to 10% by 2035



In March 2020, the European Commission proposed a new Circular Economy Action Plan:

- climate neutrality by 2050 under the Green Deal
- waste prevention and management
- strengthening the EU's growth, competitiveness and global leadership



On **9 February 2021**, the European Parliament called for stricter recycling regulations and legally binding targets on material use and consumption:

climate-neutral, environmentally sustainable, and fully circular economy, free from toxic pollutants by 2050.



Cohesion policy of the EU, however, extends beyond funding mechanisms

It offers a comprehensive policy framework for integrated regional development, emphasizing each region's unique strengths in implementing circular economy principles

It closely cooperates with local stakeholders, supporting regional authorities in building capacity and driving sustainable transformation



Project Example – Slovenia

With support from EU funds, Slovenia has achieved remarkable progress in waste recycling. It has:

- strengthened separate collection and recycling
- reduced the amount of waste sent to landfill by 59%.
- invested in prevention and reuse

Ljubljana currently produces 41% less waste per capita than the EU average

Ljubljana Regional Waste Management Centre:

- an EU-funded project that initially served 17 municipalities
- later this expanded to 37, rendering additional waste treatment facilities unnecessary



5.

POLICIES AND ACTIONS / PROJECTS OF GREECE TO ACHIEVE THE GOAL



Greece has recently developed key strategies in:

- circular economy
- climate change adaptation
- biodiversity



These are supported—among other initiatives—through the EU's LIFE Programme, particularly via three integrated projects with a total budget exceeding €47 million, expected to leverage an additional €1.5 billion in complementary funding over the coming years.



Nevertheless, Greece continues to face long-term challenges in several environmental sectors:

- investment needs for green technologies
- ensuring sufficient funding

While EU funding has already contributed to building a greener economy in Greece, further investment is required—especially in energy and transport infrastructure—to promote sustainable development.

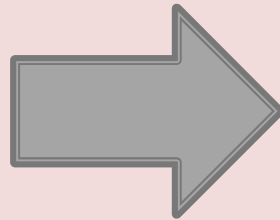
In 2019, new initiatives were launched.





The year 1997:

- Ministerial Decision (JMD) 113944/97
(Official Gazette B' 1016/1997)
- Ministerial Decision 14312/1302/00
(Official Gazette B' 723/2000)
- JMD 50910/727/2003
(Official Gazette B' 1909/2003)



in order to ensure full compliance with
EU Directive 91/156/EEC

JMD 50910/727/2003 established the guidelines, measures, and procedures required to mitigate the negative environmental impacts of waste through improved management.



National Waste Management Plan (NWMP):

- defines Greece's overarching waste policy and serves as the strategic framework for developing Regional Waste Management Plans (RWMPs), which cover the entire national territory.
- is prepared by the Ministry of Environment and Energy and approved by the Council of Ministers, ensuring political commitment and a unified national approach to waste management.





The central goal of the NWMP:

1. Waste prevention and reduction, and
2. Reduced use of natural resources, with improved efficiency in their utilization.



The NWMP is aligned with Greece's National Energy and Climate Plan (NECP), ensuring a coherent approach to securing long-term competitiveness, promoting sustainable economic growth, and supporting job creation in the context of the EU's 2050 climate neutrality goal.

The latest NWMP (2020–2030) introduces ambitious targets aligned with the EU:

- At least 55% preparation for reuse and recycling of **MSW** by weight by 2025 and 60% by 2030
- Limiting landfilling to 10% of generated **MSW** by 2030.

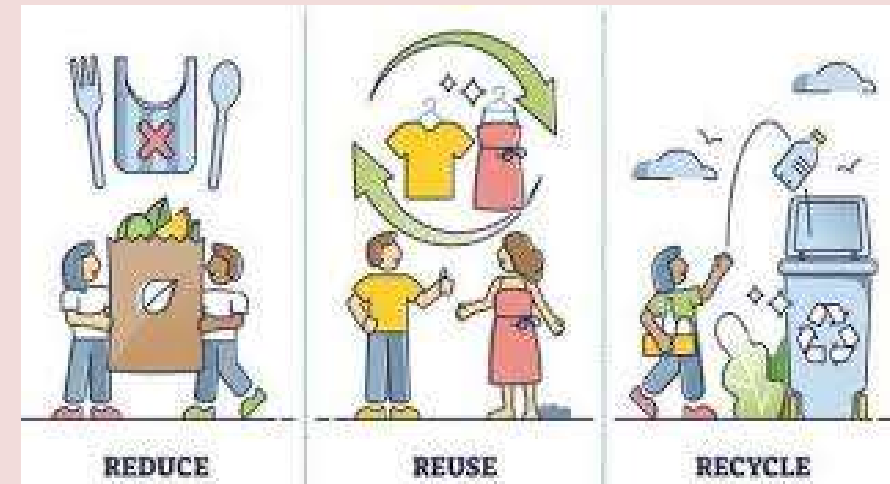
It emphasizes:

- Expansion of separate waste stream collection,
- Promotion of source separation,
- Implementation of the "Pay-As-You-Throw" principle,
- Upgrading and reinforcing Material Recovery Facilities (MRFs).



The plan includes:

- public awareness and outreach campaigns



It also introduces a series of legislative measures aimed at:

- Waste prevention,
- Enhanced recycling, and
- Improving overall waste management in line with the strategic directions of the **NWMP**.



6.

**POLICIES AND ACTIONS / PROJECTS OF LOCAL GOVERNMENTS TO ACHIEVE
THE GOAL**



In Greece, **local Government Organizations (LGOs)** are:
- public legal entities established within specific territorial jurisdictions that administrate local affairs.

Their governing bodies are elected:
- through universal suffrage by the local electorate



Each LGO has a defined area, headquarters, and population

According to the current administrative structure of Greece, every point in the country (except for Mount Athos) falls under the jurisdiction of:

- a primary-level LGO (municipality)
- a secondary-level LGO (region).



Official Gazette B' 1327/17.4.2019
Law 3852/2010
Law 3852/2010



Article 75 of Law 3463/2006 specifies that:

Municipalities are responsible for the cleanliness of public spaces, waste collection and management, construction and maintenance of sewage and biological treatment systems, and the implementation of preventative and corrective measures to protect waste disposal sites, including fire safety compliance



Under Article 228 of Law 4555/2018, primary-level LGOs (municipalities) are assigned the following waste management responsibilities:

- Developing and implementing Local Waste Management Plans (LWMPs) and waste reduction/prevention programs;
- Establishing separate collection systems for at least four recyclable waste streams: glass, paper, plastics, and metals;
- Organizing a separate collection of biowaste, particularly from restaurants, households, large producers, and green waste from parks and gardens;
- Collecting and transporting residual mixed municipal waste and source-separated recyclable materials to suitable recycling, recovery, or disposal facilities following the respective Regional Waste Management Plans (RWMPs);
- Eradicating illegal waste disposal sites and restoring existing Uncontrolled Waste Disposal Areas (UWDA);
- Conducting citizen awareness and outreach campaigns within the municipal boundaries and encouraging actions aligned with circular economy principles;
- Registering all relevant data in the Integrated Waste Management Information System, developed by the General Secretariat for Waste Coordination and Management of the Ministry of the Interior, for monitoring project implementation and target achievement.

Regional Waste Management Plan (RWMP)

constitutes a comprehensive framework for managing all waste streams generated within its boundaries. Accordingly, the aim is:

- a) Prevention
- b) Reuse
- c) Recycling
- d) Other forms of recovery (e.g., energy recovery)
- e) Safe final disposal





The RWMP's policy pillars are centred on:

- Preserving the public character of waste management to protect public health and the environment under a sustainable development framework for the benefit of society;
- Integrated planning for all waste streams in the Attica Region at both regional and local levels, consistent with the National Waste Prevention Strategy;
- Ensuring high-level protection of the environment and public health, with adequate and appropriate infrastructure for collection, recovery, and disposal;
- Promoting resource-efficient practices for the benefit of society in an equitable manner;
- Strengthening the implementation of Extended Producer Responsibility (EPR) mechanisms;
- Enhancing the quality of municipal waste management services provided to citizens and businesses;
- Fostering public engagement and participation in waste-related initiatives;
- Rationalizing service costs and encouraging environmentally and economically sustainable investments.

7.
SUGGESTIONS FOR INDIVIDUAL ACTIONS TO ACHIEVE THE GOAL



1. Composting





2. Responsible Recycling





3.Waste Auditing



4. Sustainable Purchasing Habits



PETE (1) and HDPE (2) are highly recyclable.
PVC (3), LDPE (4), PP (5), and PS (6) are less or not recyclable.
Type 7 (Other) is generally non-recyclable.



5. Reducing Kitchen Disposables



6. Buying and Donating Second-Hand Items



7. Supporting Local Farmers and Bulk Markets



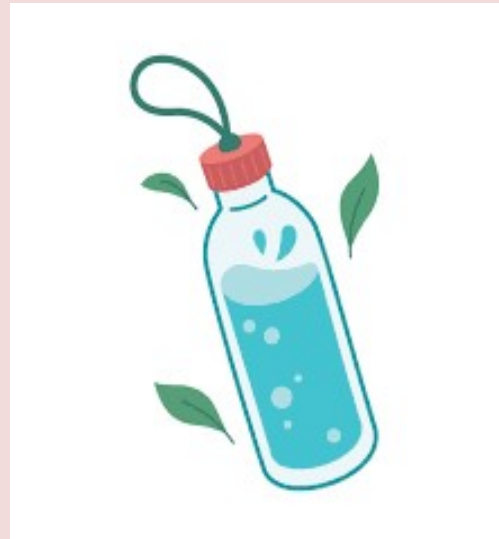


8. Avoiding Plastic Bags



shutterstock.com - 1599319360

9. Reducing Bottled Water Use



10. Limiting Paper Use





11. Avoiding using disposable containers and utensils for food and drinks





12. Finding new homes for old furniture or recycling it properly



**13. Responsible disposal of electronic waste
(old computers, televisions and other devices)**



In general, there should be a coupling of forces between households as individual units and the state, in order to lead to the improvement of the waste management process:

- Increasing the number of employees and cleaning vehicles from each municipality**
- Obligation of each municipality and each household individually to properly recycle its waste**
- Introducing knowledge of the correct way of recycling and managing waste to the primary and secondary curriculum**



8. CONCLUSIONS

Sustainable waste and refuse management constitutes a central pillar of the broader effort to transition toward a circular and climate-resilient economy, both at the European and national levels.

The challenges are multifaceted—environmental, social, economic, and institutional—and call for coordinated actions across all levels of governance.



The legislative framework and funding mechanisms have been significantly reinforced at the European Union level through successive Circular Economy Action Plans, legally binding recycling targets, and a wide range of cohesion policy instruments.

These measures aim to:

- reduce environmental burdens,**
- enhance resource efficiency,**
- generate green jobs through:**
 - innovation,**
 - investment,**
 - systemic change**



In Greece, significant progress has been made in aligning national strategies with European directives.

The formulation and implementation of the National Waste Management Plan (NWMP) and the corresponding Regional Plans reflect a growing institutional commitment to:

- modernizing infrastructure,
- adopting new technologies,
- promoting best waste:
 - prevention,
 - reuse,
 - recycling practices



However, technical solutions alone are not sufficient.

The transition to sustainable waste management requires:

- a cultural shift
- reconfiguration of values, habits, and consumption models.

The following are critical:

- citizen participation
- individual behavioural change
- community engagement in complementing institutional efforts.



In this context, small-scale individual actions such as:

- composting,
- responsible recycling,
- sustainable purchasing,
- reduction of single-use plastics
- promoting second-hand use,
- reducing food waste,
- embracing minimal packaging practices

=> contribute to a societal model in which waste is no longer a by-product but a resource to be reintegrated into the economic cycle.



In conclusion, achieving Sustainable Development Goal 12 in waste and consumption is an ongoing process that requires strategic planning, regulatory coherence, robust infrastructure, informed policy-making, and an empowered and environmentally literate citizenry. Sustainability ambitions can only be translated into tangible outcomes for future generations through a holistic, multi-level, and participatory approach.





Thank you for your attention!