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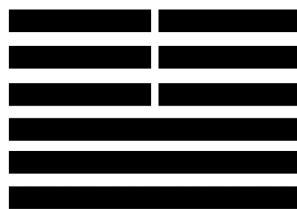
CEIPES



# Project GYW

*2022-1-PL01-KA220-YOU-000085715*

E-course “Green Skills for successful employment and work in the process of the transition to a more ‘green’ and environmentally sustainable economy” for young people at risk of marginalization



Education Centre "Socialization"

## Module II

# MODULE II

## Learning Objectives

This module is based on the second GreenComp Competence Area, "Embracing Complexity in Sustainability". It elaborates on the three core competencies of this area, namely systems thinking, critical thinking and problem framing. The learning objectives are :

- Understand the competence area Embracing Complexity in Sustainability and its core competencies.
- Learn about the importance of these competencies for sustainable development.
- Understand the knowledge, skills and attitudes required to master the second GreenComp domain.
- Recognise the Embracing Complexity competencies in real life examples.

# Embracing Complexity in Sustainability

## Introduction

The skill of embracing complexity in sustainability as part of the course “Green Skills for successful employment and work in the process of the transition to a more ‘green’ and environmentally sustainable economy” is crucial for understanding and addressing the complex challenges we face in creating a sustainable future. We live in a world where environmental, social, and economic issues are deeply interconnected. Traditional linear approaches are insufficient to tackle sustainability challenges. We will explore systems thinking, critical thinking, and problem framing as key components of embracing complexity. As it is embarked on the journey towards a greener and more sustainable future, we are faced with a myriad of interconnected challenges. From climate change and biodiversity loss to resource depletion and social inequities, these issues cannot be addressed in isolation. Instead, they require a holistic and integrated approach that considers the intricate web of relationships and interdependencies within our socio-ecological systems.

Embracing complexity in sustainability is about developing the mindset and tools to understand the interconnected nature of these challenges. It involves recognizing that environmental issues are intertwined with economic activities, societal lifestyles, and the very functioning of our planet. By embracing complexity, we can unravel the intricate tapestry of sustainability issues, identify underlying causes, and devise comprehensive strategies for meaningful change.

In this course, we will explore three key components of embracing complexity: systems thinking, critical thinking, and problem framing. These skills are essential for analyzing and addressing sustainability challenges in a comprehensive and effective manner. Through engaging discussions, practical examples, and hands-on exercises, we will deepen our understanding of these skills and their applications in the context of a transitioning economy.

# Embracing Complexity in Sustainability

## Introduction

Throughout the course, we will highlight the real-life applications of embracing complexity in sustainability, examine how systems thinking allows to uncover hidden connections and feedback loops within complex systems. We will explore the power of critical thinking in challenging assumptions, evaluating information, and fostering innovation. Additionally, we will delve into the art of problem framing, which helps us define and structure sustainability challenges to identify suitable approaches for prevention, mitigation, and adaptation.

By the end of this course, you will not only possess a solid understanding of embracing complexity in sustainability but also acquire practical tools to apply these skills in your professional endeavors. Whether you are seeking successful employment in green industries or striving to make a positive impact within your current workplace, these skills will empower you to navigate the complexities of our transitioning economy and contribute to building a more sustainable future.

By embracing complexity, we can address the interconnected challenges and pave the way for a greener and more sustainable world.



**Module II:**

Second GreenComp Competence area

**| Embracing Complexity in  
Sustainability**





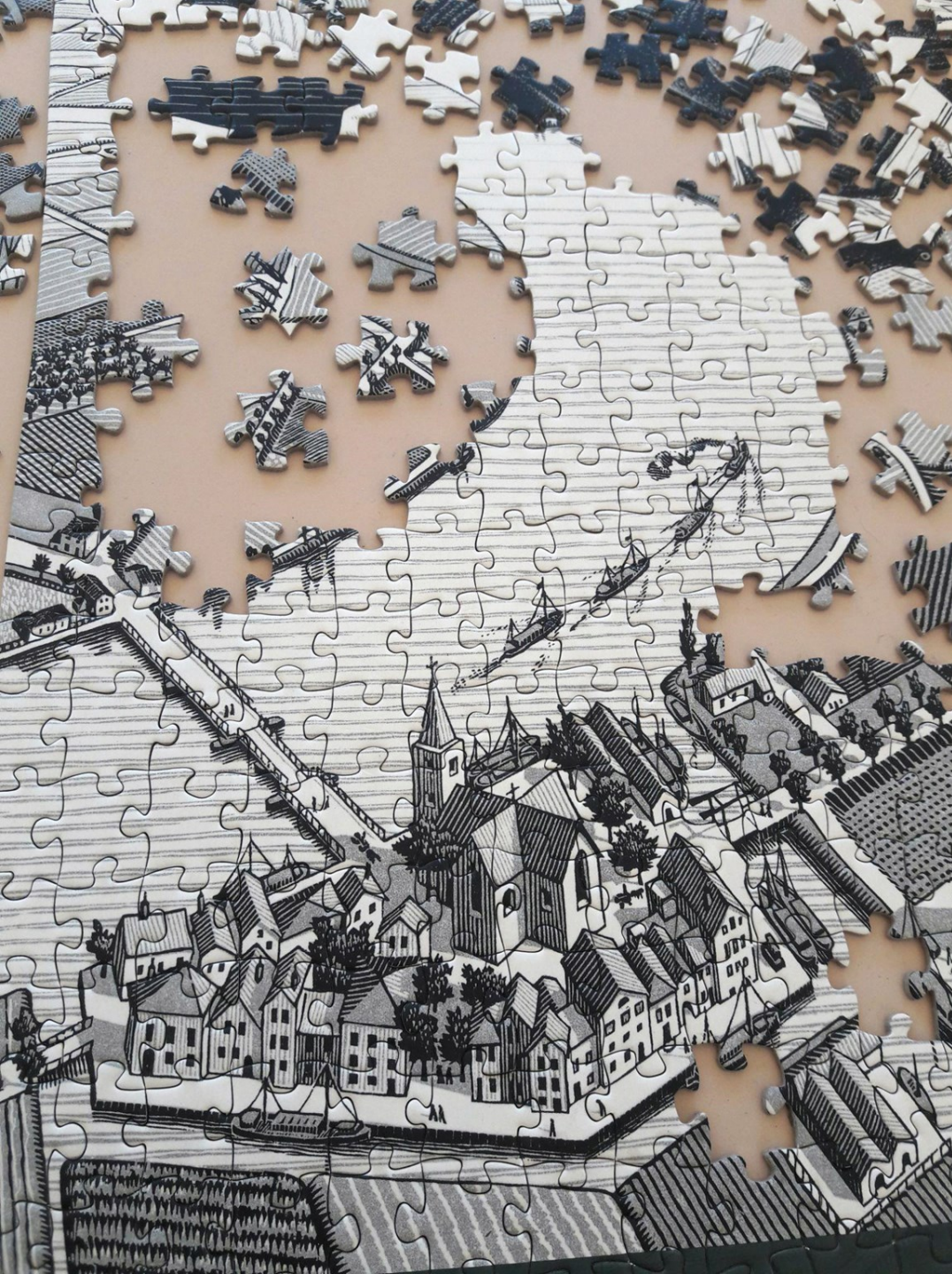
**Embracing complexity in sustainability**

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**Competence I:**

**System Thinking**





# Systems Thinking

## What is it?

**Systems thinking** refers to the ability to understand and analyze complex systems and their interconnections within the environmental, social, and economic realms. It involves recognizing that these systems are composed of interconnected parts that influence each other and function as a whole.

**Systems thinking** enables individuals to:

- Identify feedback loops
- Analyze system boundaries
- Consider multiple perspectives
- Anticipate unintended consequences
- Design holistic solutions
- Foster collaboration and cooperation



# Systems Thinking and sustainability

In the context of sustainability, systems thinking is crucial because it allows individuals to go beyond focusing solely on isolated components or problems and consider the broader context and interdependencies. It involves understanding how changes in one aspect of the system can have cascading effects on other parts and the overall sustainability of the system.



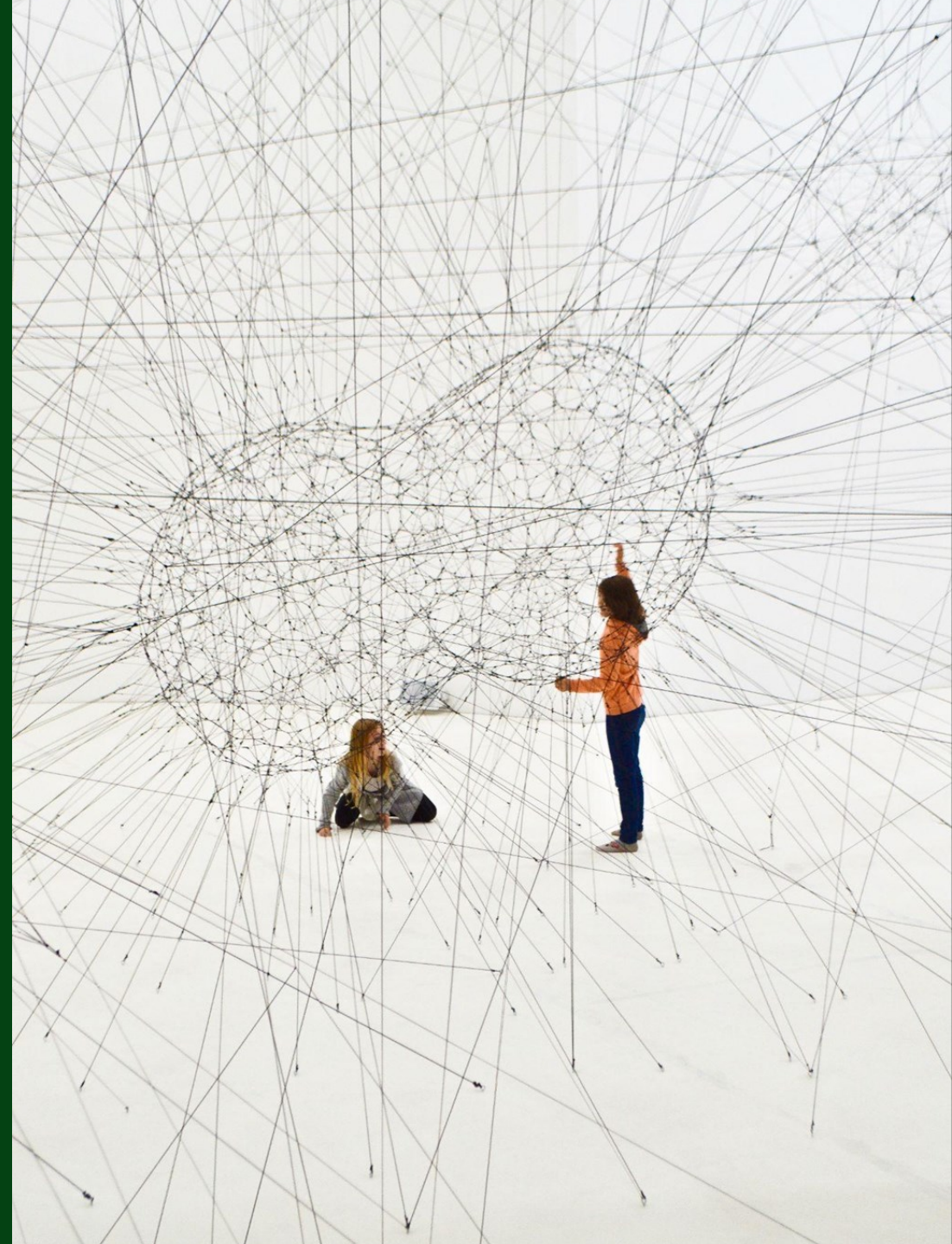
# Systems Thinking

## Why is it important?

Systems thinking is vital for Green Skills in the transition to a more 'green' and environmentally sustainable economy. It helps people understand:

- the complexity of sustainability challenges,
- identify strategic intervention points,
- anticipate systemic impacts,
- design integrated solutions,
- foster collaboration,
- navigate uncertainty,
- promote long-term thinking.

By applying systems thinking, individuals can contribute to effective and sustainable solutions that drive the transition to a greener and more sustainable future.



# Systems Thinking

## Knowledge, Skills and Attitudes required (KSA)



### Knowledge

**Understanding of systems theory:** knowledge of the fundamental concepts and principles of systems theory, including concepts like feedback loops, interconnections, emergence, and resilience.

**Environmental literacy:** knowledge of environmental issues, sustainability principles, and ecological processes.

**Systems mapping and analysis:** knowledge of tools and techniques for mapping and analyzing systems.



### Skills

**Systems thinking and analysis:** the ability to apply systems thinking to analyze and understand complex systems in the context of sustainability.

**Holistic problem-solving:** the skill to approach sustainability challenges from a holistic perspective, considering multiple dimensions and interdependencies.

**Systems mapping and visualization:** proficiency in using tools and techniques for mapping and visualizing systems.



### Attitudes

**Systems awareness:** cultivating an awareness of the interconnectedness and interdependence of systems and their impact on sustainability

**Open-mindedness:** being open to different perspectives, ideas, and feedback when analyzing and understanding complex systems.

**Long-term thinking:** embracing a long-term perspective and considering the future implications of decisions and actions.

**Adaptability:** being adaptable and flexible in the face of complex and changing systems..

# Problem Framing

## Real-life examples



**Integrated waste management:** a waste management professional applies system thinking by considering the entire waste management system, from waste generation to disposal. They analyze the flow of waste, identify opportunities for recycling and composting, and implement strategies to minimize landfill waste.



**Renewable energy integration:** an energy engineer utilizes system thinking to integrate renewable energy sources into the power grid. They analyze the variability of renewable energy generation, storage capabilities, and demand patterns to optimize the integration of solar, wind, and other renewable sources.



**Urban planning for sustainable cities:** an urban planner applies system thinking to design environmentally sustainable cities. They consider the interactions between transportation systems, land use patterns, infrastructure, and green spaces. By integrating public transportation networks, promoting walkability and cycling infrastructure, and preserving natural areas, they create urban environments that reduce congestion, promote active lifestyles, and minimize environmental impacts.



# Critical Thinking

## More real-life examples



**Circular economy strategies:** a sustainability consultant employs system thinking to implement circular economy strategies within businesses and industries. They analyze material flows, waste streams, and product lifecycles to identify opportunities for waste reduction, recycling, and resource recovery. By implementing closed-loop systems, they help businesses optimize resource use, minimize waste generation, and create a more sustainable and circular economy.



**Climate change adaptation:** a climate resilience planner utilizes system thinking to develop strategies for climate change adaptation. They consider the interconnectedness between climate change impacts, social vulnerabilities, and ecological systems. By analyzing the risks and dependencies within a given region, they develop adaptive strategies that enhance community resilience, protect ecosystems, and promote sustainable.

# Systems Thinking

## Real-life examples



A **professional working in renewable energy development** possesses knowledge of various renewable energy technologies, their benefits, and their integration into the existing energy grid. This knowledge helps them understand the systemic impact of renewable energy systems on reducing greenhouse gas emissions, promoting energy efficiency, and fostering a sustainable energy transition.



An **urban planner** incorporates system thinking skills when designing sustainable cities. They analyze the interactions between transportation, land use, and infrastructure to develop integrated solutions that reduce traffic congestion, promote active transportation, and enhance energy efficiency. By considering the broader system, they create sustainable urban environments that prioritize public transportation, pedestrian-friendly infrastructure, and green spaces.



An **environmental advocate** demonstrates a systems thinking attitude by recognizing the interconnectedness of environmental issues with social and economic factors. They advocate for policies and initiatives that address the root causes of environmental degradation, such as poverty, inequality, and unsustainable consumption patterns. Their attitude drives them to engage with diverse stakeholders, bridge gaps between sectors, and work towards holistic solutions that balance environmental, social, and economic priorities.





**Embracing complexity in sustainability**

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**Competence II:**

**Critical Thinking**



# Critical Thinking

## What is it?

**Critical thinking** refers to the intellectual process of analyzing, evaluating, and interpreting information and ideas in a systematic and objective manner. It involves actively engaging with concepts, arguments, and evidence to form reasoned judgments and make informed decisions. Critical thinking goes beyond accepting information at face value and instead encourages questioning, examining assumptions, considering alternative perspectives, and seeking logical coherence.

### **Key components of critical thinking include:**

Analysis

Evaluation

Inference

Interpretation

Reflection

Problem-solving

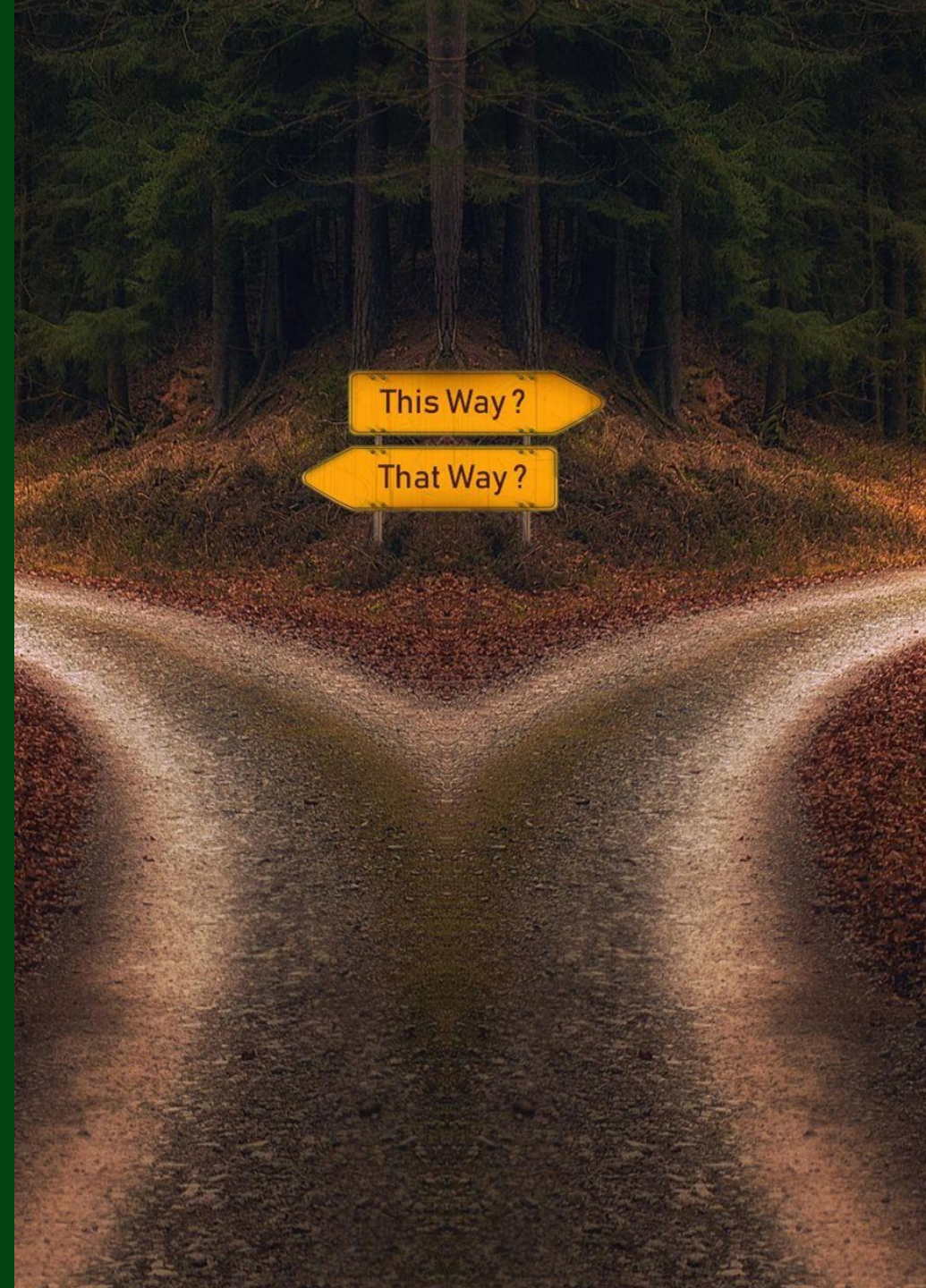


# Critical Thinking

## Why is it important?

**Critical thinking** is essential for effective problem-solving, informed decision-making, analyzing information, constructing coherent arguments, fostering creativity, facilitating lifelong learning, and empowering independence. It is a foundational skill that equips individuals with the tools to navigate the complexities of today's world and make thoughtful, reasoned choices. It includes:

- Effective problem-solving
- Decision-making
- Analyzing and evaluating information
- Constructing coherent arguments
- Enhancing creativity and innovation:
- Lifelong learning: Empowering independence





# Critical Thinking

## Knowledge, Skills and Attitudes required (KSA)



### Knowledge

Critical thinking requires a solid foundation of knowledge in various subject areas. This includes **understanding fundamental concepts, principles, theories, and facts relevant to the topic at hand.**

Knowledge provides the necessary background information and context for critical thinking to take place. It involves being **well-informed about the subject matter, staying updated with current research and developments, and having a broad knowledge base to draw upon.**



### Skills

**Analysis:** breaking down complex information into its constituent parts, identifying patterns, and understanding the relationships between different elements.

**Evaluation:** assessing the credibility, relevance, and quality of information, arguments, and sources.

**Interpretation:** understanding and making sense of information by considering the context, subtext, and intended meaning.

**Problem-solving:** applying critical thinking skills to analyze and solve problems, identifying alternative solutions, evaluating their potential outcomes, and making informed decisions.



### Attitudes

**Open-mindedness:** being receptive to new ideas, alternative viewpoints, and differing perspectives.

**Curiosity:** maintaining a sense of intellectual curiosity and a desire to seek knowledge, explore new ideas, and ask questions.

**Intellectual humility:** recognizing the limitations of one's own knowledge and being willing to acknowledge and learn from mistakes or incorrect assumptions.

**Skepticism:** adopting a healthy level of skepticism towards information, claims, and arguments.



# Critical Thinking

## Real-life examples



**For a Sustainable Business Developer,** critical thinking skills are essential. By critically analyzing market trends, identifying opportunities for eco-friendly products or services, evaluating the feasibility of sustainable business models, and considering potential environmental impacts, individuals can contribute to the growth of green industries and the transition to a more sustainable economy.



Critical thinking is crucial for professionals involved in **supply chain management with a focus on sustainability.** By critically assessing suppliers' practices, evaluating the environmental impact of transportation and logistics, and considering ethical sourcing, individuals can contribute to developing sustainable supply chains. Critical thinking skills help identify areas for improvement, assess risks, and implement strategies to reduce the ecological footprint of supply chain operations.



By encouraging critical thinking skills in individuals and communities, **environmental educators** can foster a deeper understanding of environmental issues, encourage sustainable behaviors, and promote active participation in environmental initiatives. Critical thinking skills help individuals assess information, analyze complex problems, and develop informed perspectives on environmental challenges.

# Critical Thinking

## More real-life examples



**Renewable energy planning:** critical thinking plays a crucial role in the field of renewable energy. Professionals in this sector need to critically assess factors such as site selection, energy efficiency, financial viability, and environmental impact when planning and implementing renewable energy projects. By employing critical thinking skills, they can evaluate different technologies, analyze data, and make informed decisions to maximize the efficiency and effectiveness of renewable energy systems.



**Environmental policy and advocacy:** critical thinking is vital for professionals involved in environmental policy and advocacy work. By critically analyzing existing policies, evaluating their effectiveness, and identifying gaps or opportunities for improvement, individuals can contribute to the development and implementation of effective environmental regulations. Critical thinking skills also help in advocating for sustainable practices and influencing decision-makers to adopt environmentally friendly policies.





**Embracing complexity in sustainability**

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**Competence III:**

**Problem framing**





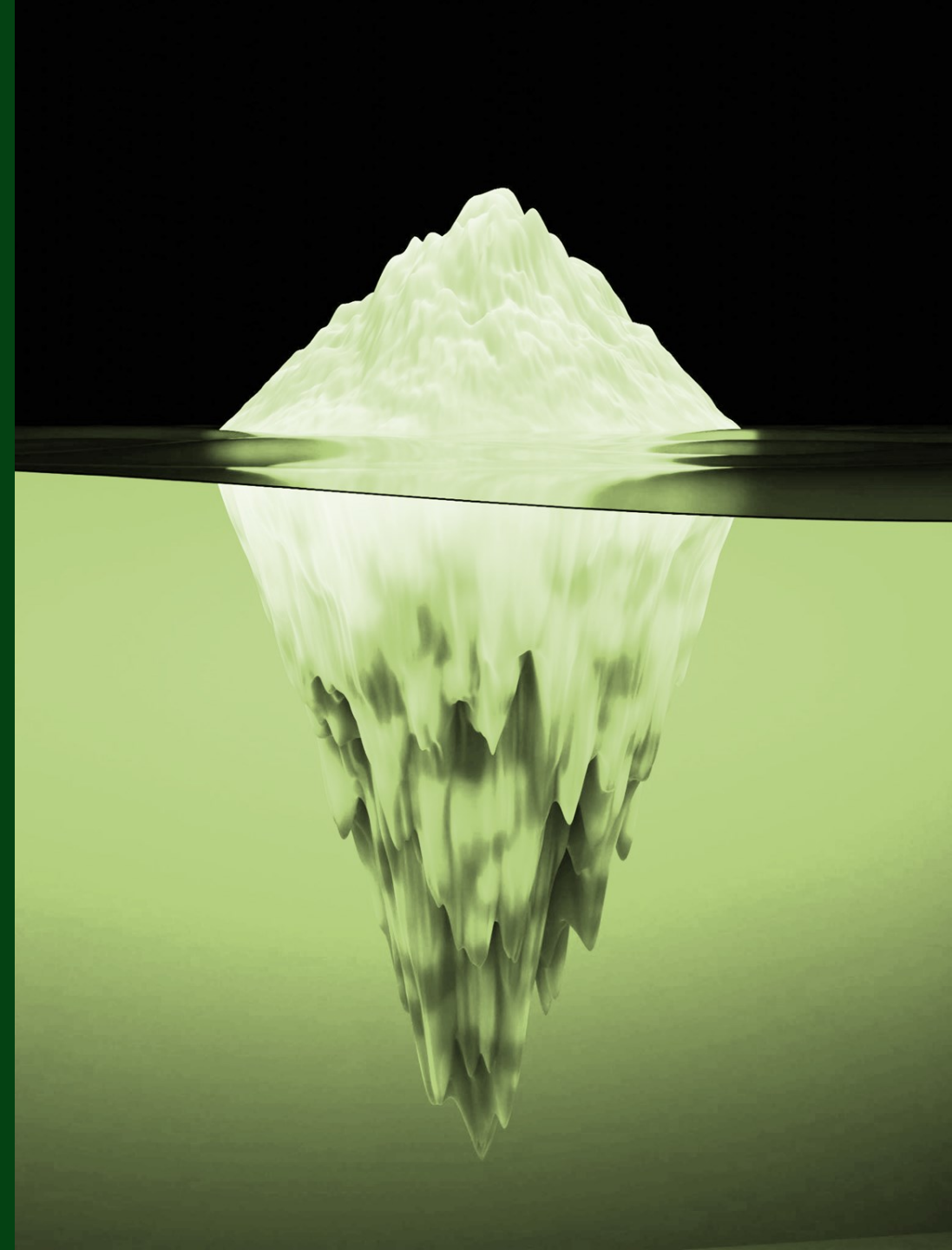
# Problem Framing

## What is it?

When framing a problem, individuals or teams consider various factors, such as:

- The scope and boundaries of the problem
- The stakeholders involved,
- The underlying causes and interconnections,
- The desired outcomes.

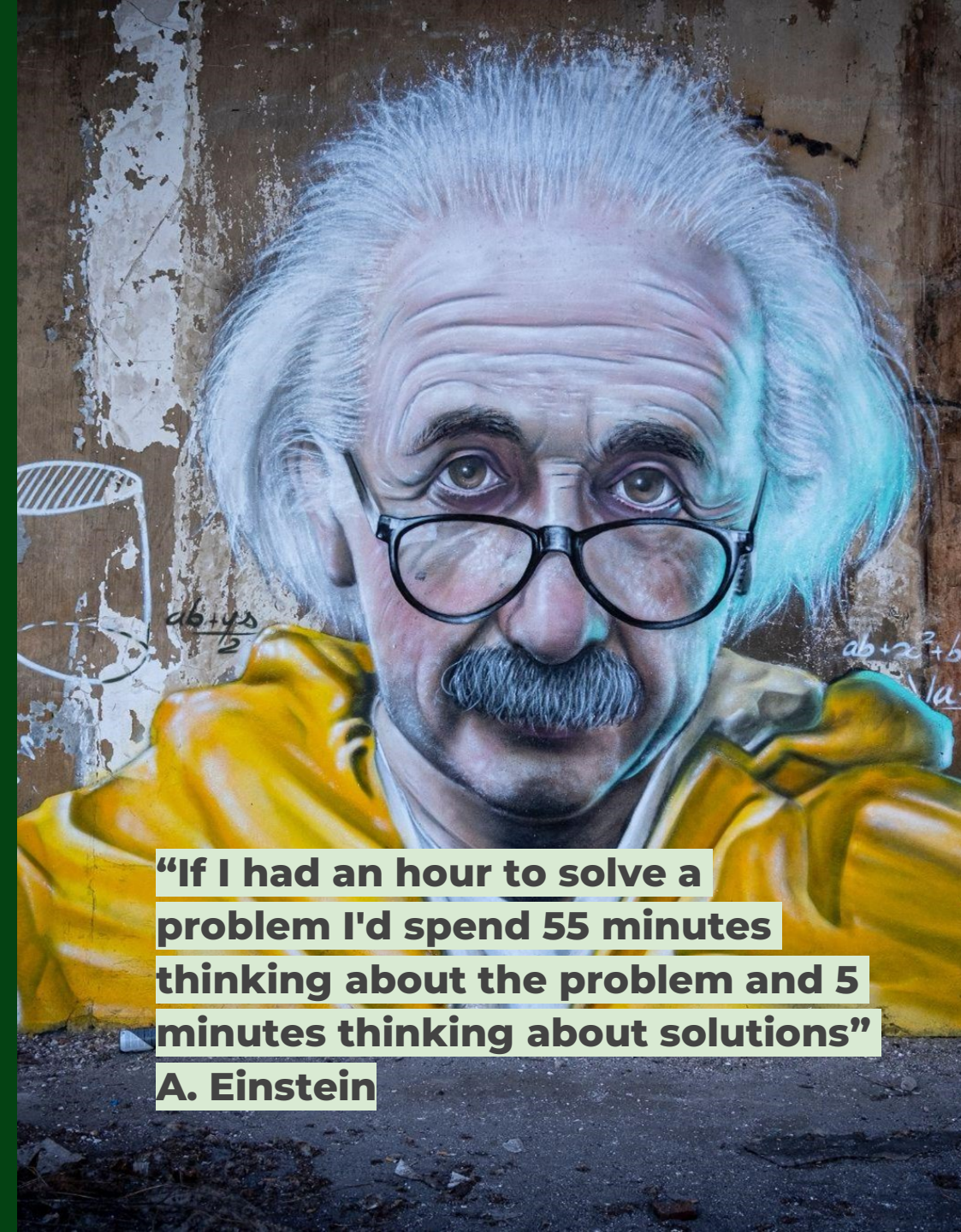
The goal is to develop a comprehensive understanding of the problem, its complexities, and the factors that contribute to its persistence.



# Problem Framing

## What is it?

- Problem framing helps to avoid superficial or incomplete problem definitions that may lead to ineffective or misguided solutions.
- By carefully framing a problem, individuals can gain a deeper understanding of its underlying dynamics, identify relevant variables and factors, and consider the potential unintended consequences of proposed solutions.
- Problem framing involves considering multiple perspectives and ensuring that the problem is defined in a way that is inclusive and accounts for diverse viewpoints. This helps to avoid bias and ensures that all relevant dimensions and stakeholders are considered during the problem-solving process.



**“If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions”**

**A. Einstein**



# Problem Framing

## Why is it important?

### The key reasons why problem framing is important:

- Helps professionals in the green economy identify and define the most pressing sustainability challenges.
- Enables professionals to develop comprehensive solutions that address the underlying causes and interconnectedness of sustainability challenges.
- Encourages professionals to consider the long-term implications of their actions and solutions.
- Facilitates effective stakeholder engagement and collaboration in the green economy.
- Helps professionals optimize the use of resources in the green economy.



# Problem Framing

## Knowledge, Skills and Attitudes required (KSA)



### Knowledge

**Environmental science and sustainability:** knowledge of environmental science principles and concepts is crucial for understanding the complex and interconnected nature of sustainability challenges.

**Systems thinking:** understanding systems thinking and its application to sustainability is essential for problem framing. Knowledge of how different elements of a system interact and influence each other helps professionals identify the underlying causes and interdependencies of environmental problems.



### Skills

**Analytical thinking:** strong analytical skills are necessary for problem framing. Professionals need the ability to gather and analyze relevant data, assess cause-effect relationships, and identify patterns and trends.

**Stakeholder engagement:** effective stakeholder engagement skills are essential for gathering diverse perspectives and incorporating them into problem framing.

**Systems mapping:** proficiency in systems mapping techniques enables professionals to visually represent the interconnected elements and relationships of a problem.



### Attitudes

**Open-mindedness:** adopting an open-minded attitude is crucial for effective problem framing in the green economy. Open-mindedness promotes creativity and encourages the consideration of multiple possibilities during problem framing.

**Collaboration and cooperation:** problem framing often requires collaboration with diverse stakeholders and experts.

**Environmental stewardship:** a commitment to environmental stewardship is vital for effective problem framing in the green economy.



# Problem Framing

## Real-life examples



**Developing sustainable business models:** professionals skilled in problem framing can assess the environmental challenges faced by businesses and develop innovative and sustainable business models.



**Designing sustainable urban infrastructure:** problem framing skills are crucial for professionals involved in urban planning and infrastructure development. They can identify sustainability challenges such as transportation inefficiencies, energy consumption, and waste management.



**Promoting sustainable agriculture and food systems:** professionals with problem framing skills can address the environmental impacts of agriculture and food systems. They can identify challenges related to resource depletion, food waste, and unsustainable farming practices.

# Problem Framing

## More real-life examples



**Developing circular economy strategies:** Problem framing is crucial for professionals involved in the transition to a circular economy, where resources are used efficiently and waste is minimized. They can identify challenges in the current linear economy, such as resource depletion, pollution, and waste generation.



**Addressing climate change adaptation and resilience:** problem framing skills are essential for professionals working on climate change adaptation and resilience strategies. They can identify the challenges and vulnerabilities associated with climate change impacts, such as extreme weather events and sea-level rise.



**Advocating for environmental policy change:** professionals skilled in problem framing can contribute to policy change by identifying environmental challenges and framing them effectively. They can analyze the existing policy frameworks, identify gaps, and propose solutions that align with environmental sustainability goals.

# Embracing Complexity in Sustainability

## Self-assessment of knowledge after the course

1. Systems thinking allows us to understand reality in relation to other contexts and fields. Which of the following statements about systems thinking is true? (Select two)

- a) It focuses solely on environmental factors
- b) It analyzes parts in isolation, disregarding the whole system
- c) It helps identify feedback mechanisms and intervention points
- d) It simplifies complex sustainability problems

2. Critical thinking is a cognitive process that involves evaluating and understanding information regarding sustainability problems. Which of the following skills are associated with critical thinking? (Select two)

- a) Accepting information without questioning its validity
- b) Challenging assumptions and the status quo
- c) Reflecting on personal, social, and cultural influences on thinking
- d) Ignoring information from different disciplines

3. Problem framing involves defining and structuring sustainability problems based on their complexity and stakeholders involved. What does problem framing help in? (Select two)

- a) Simplifying sustainability problems for easier analysis
- b) Identifying suitable approaches to preventing problems
- c) Recognizing the interconnectedness of socioecological systems
- d) Disregarding the temporal and geographical context of problems



# Embracing Complexity in Sustainability

## Self-assessment of knowledge after the course

4. How does systems thinking contribute to sustainability? (Select one)

- a) By focusing solely on one aspect of sustainability at a time
- b) By recognizing the interdependencies between economic and environmental activities
- c) By oversimplifying complex sustainability problems
- d) By disregarding the influence of societal factors on sustainability

5. What is the primary goal of critical thinking in sustainability? (Select one)

- a) Accepting information without questioning its validity
- b) Prioritizing short-term gains over long-term sustainability goals
- c) Challenging assumptions and evaluating evidence
- d) Disregarding different perspectives and values

6. Problem framing is the process of identifying actual or potential sustainability problems. It involves: (Select two)

- a) Simplifying problems to focus on isolated components
- b) Defining and structuring problems based on complexity and stakeholders involved
- c) Determining whether the current situation is already a problem or has potential to become one
- d) Disregarding the context of a given problem

# Embracing Complexity in Sustainability

## Self-assessment of knowledge after the course

7. How does systems thinking help in understanding sustainability problems? (Select one)

- a) By focusing solely on one aspect of sustainability at a time
- b) By recognizing the interconnections and feedback loops within systems
- c) By oversimplifying complex sustainability challenges
- d) By ignoring the influence of social and economic factors

8. What role does critical thinking play in sustainability? (Select one)

- a) Accepting information without questioning its validity
- b) Challenging assumptions and reflecting on personal biases
- c) Disregarding the influence of cultural backgrounds on thinking
- d) Prioritizing short-term solutions over long-term sustainability

9. What is the purpose of problem framing in sustainability? (Select two)

- a) Simplifying complex problems to overlook their interconnectedness
- b) Identifying suitable approaches to preventing and mitigating problems
- c) Defining and structuring problems based on their complexity and stakeholders involved
- d) Disregarding the time and geographical scope of sustainability problems

10. How does embracing complexity in sustainability contribute to problem-solving? (Select one)

- a) By oversimplifying sustainability challenges for quicker solutions
- b) By disregarding the interconnections and interdependencies among factors
- c) By considering the interconnectedness and interdependencies to develop holistic solutions
- d) By focusing solely on short-term gains at the expense of long-term sustainability



# Workshop

## Myth About Green Economy

**Workshop title:** Myths About Green Economy

**Activity duration:** Approx. 120 minutes

**Objectives:** To explore and dispel common misconceptions surrounding the concept of the green economy and understand its significance in addressing environmental challenges.

**Methods used:** Non-formal education, Sensory Test, Natural Toothpaste making, Debriefing

### Workshop description and timing:

#### 1. Session – (15 min.)

1.1 Defining Green Economy

Watch the video:

<https://www.youtube.com/watch?v=7MkSgSt3yVI&pp=ygUZbXI0aHMgYWJvdXQgR3JlZW4gRWVudm9teQ%3D%3D>

Explain the basic concept of a green economy and its importance in sustainable development.

Discuss how it differs from traditional economic models.

1.2. Icebreaker Activity: "My Green Economy Expectations"

Participants share their expectations and understanding of the green economy.

# Workshop

## Myth About Green Economy

### **Session 2: Identifying Myths (15 minutes)**

#### 2.1. Myth-Busting Activity: "Myth or Fact"

Present a series of statements related to green economy myths.

Participants vote on whether each statement is a myth or fact.

#### 2.2. Group Discussion: Analyzing Myths

Divide participants into small groups to discuss the myths presented.

Each group identifies the underlying misconceptions in the statements.

### **Session 3: Debunking Myths (25 minutes)**

#### 3.1. Myth Debunking Presentation

Facilitator presents the correct information and facts to dispel the identified myths.

Engage participants in discussions to ensure understanding.

#### 3.2 Case Studies: Real-World Examples

Share case studies of successful green economy initiatives.

Discuss how these initiatives have addressed environmental challenges.



# Workshop

## Myth About Green Economy

### Session 4: Benefits of the Green Economy (25 minutes)

#### 4.1 Presentation: The Positive Impact of Green Economy

Highlight the environmental, economic, and social benefits of embracing green practices.

Showcase success stories of businesses or countries that have transitioned to a green economy.

#### 4.2 Group Activity: Benefits Brainstorming

Participants work in groups to brainstorm potential benefits for their local communities by adopting green economy principles. Questions:

1. How can a green economy stimulate economic growth and job creation?
2. What are the potential economic benefits of investing in renewable energy sources and technologies?
3. In what ways can the green economy attract private sector investments and promote entrepreneurship?
4. What are the positive impacts of transitioning to sustainable agriculture and forestry practices on biodiversity and ecosystems?
5. How can the circular economy model reduce waste and conserve valuable resources?

# Workshop

## Myth About Green Economy

### Session 5: Overcoming Challenges (20 minutes)

#### 5.1 Presentation: Challenges in Transitioning to a Green Economy

Discuss common challenges and obstacles faced during the transition to a green economy. Emphasize the need for innovative solutions.

#### 5.2 Group Discussion: Strategies for Overcoming Challenges

Participants share ideas on how to overcome the challenges discussed.

Encourage a collaborative approach to problem-solving. Questions:

What economic challenges might arise during the transition to a green economy, such as job displacement in traditional industries?

1. How can the cost of implementing green technologies and infrastructure be addressed and mitigated?
2. Are there concerns about economic competitiveness when transitioning to a green economy?
3. What technological barriers exist in transitioning to green energy sources, such as the storage and transmission of renewable energy?
4. How can the development and deployment of green infrastructure face challenges related to financing and scalability?
5. What challenges may arise during the transition period, where both green and traditional industries coexist?

# Workshop

## Myth About Green Economy

### Session 6: Conclusion and Action Planning (20 minutes)

#### 6.1 Key Takeaways

Summarize the workshop's key points and lessons learned.

#### 6.2 Action Planning

Facilitate a discussion on how participants can contribute to the promotion of green economy principles in their personal and professional lives.

#### 6.3 Closing Remarks

Thank participants for their active participation and commitment to promoting a sustainable future.