



Module 6



EFFECTIVE COMMUNICATION, COLLABORATION, AND LEADERSHIP	
Duration:	4.5 hours
Learning objectives:	<ol style="list-style-type: none"> 1. Develop adaptive thinking and flexibility to manage complex systems and respond effectively to climate-related and environmental challenges. 2. Understand and apply sustainable practices in agriculture and forestry to promote productivity, environmental stewardship, and resource conservation. 3. Build competencies in risk and uncertainty management, using structured approaches such as ISO 31000, to support informed decision-making in unpredictable contexts. 4. Strengthen resilience and problem-solving skills by integrating adaptive management, sustainability, and risk response strategies into real-world scenarios. 5. Foster critical thinking, collaboration, and strategic planning to navigate ambiguity and implement effective, evidence-based solutions.
Sub-Modules:	<ul style="list-style-type: none"> ● 6.1 Flexibility: Developing adaptive skills ● 6.2 Agriculture and Forestry Management: Sustainable practices in food production and forestry ● 6.3 Coping with Uncertainty: Strategies to manage ambiguity and risk
Resources and devices:	<ul style="list-style-type: none"> ● Slide presentation ● Webinar and videos ● Google forms and reflective prompts

	<ul style="list-style-type: none"> ● External readings
<p>Assessment approach:</p>	<p>The assessment is designed to evaluate both conceptual understanding and practical application of key competencies through formative, low-stakes tools. The assessments test participants' ability to:</p> <ul style="list-style-type: none"> ● Recognize core principles of adaptive management, such as iterative learning, flexibility, and climate resilience strategies. ● Understand key aspects of agricultural and forestry management, including sustainable practices, productivity optimization, and environmental stewardship. ● Apply knowledge of risk and uncertainty management, particularly through frameworks like ISO 31000, to assess and respond to financial, legal, and strategic threats.
<p>Skills/abilities developed:</p>	<ol style="list-style-type: none"> 1. Ability to adjust strategies in response to changing conditions and complex systems. 2. Application of iterative learning and evidence-based decision-making in uncertain environments. 3. Capacity to manage environmental stressors and implement adaptive strategies that enhance long-term sustainability. 4. Knowledge of sustainable farming practices, modern technologies, and efficient resource use to enhance productivity and ecological responsibility. 5. Understanding and applying eco-friendly, economically viable, and socially responsible land-use practices. 6. Skills in navigating ambiguity, making informed decisions with incomplete information, and building strategic resilience in unpredictable situations.

Submodule 6.1

Flexibility: Developing Adaptive Skills

→ **Skills:**

1. Adaptability
2. Flexibility
3. Resilience with respect to climate change

DEVELOPING ADAPTIVE SKILLS
Activity 1 On the road to adaptive management
Duration: 1.5 hour
Specific Learning Objectives <ol style="list-style-type: none">1. Developing foundational knowledge on adaptability, by learning the key concepts and components of adaptive management, including iterative learning, flexibility, and evidence-based decision-making.2. Bridging theoretical principles with practical skills for managing complex systems.3. Apply adaptive management principles to real-world climate resilience challenges.
Methodology, Resources and Devices <p>Methodology: Adaptive learning approach; BEAM report; webinar discussion; reflective practice; group engagement or self-paced individual activity.</p> <p>Tools: Webinar link, video, guided discussion questions, reflective prompts.</p>
Description of the activity and Key Concepts <p>Participants begin by watching the webinar "On the Road to Adaptive Management" to understand the core principles of adaptability, flexibility, and iterative decision-making. Building on this foundation, they engage in a guided discussion or reflection activity supported with a presentation. In groups, participants explore real-world applications of adaptive management through targeted discussion questions that encourage collaboration and critical thinking. For those working independently, reflective prompts help deepen their understanding and foster personal insights into how adaptive principles can be applied to enhance resilience and flexibility in the face of climate challenges. The activity promotes thoughtful engagement and practical application of the webinar's content.</p>
Key concepts: Adaptive management; Flexibility; Resilience to climate change; Collaboration; Critical thinking and reflective practice.

Assessment (to be defined with EKS - proposal)

Google form with the following questions:

1. What is the primary goal of adaptive management? Correct answer: **B**
2. Which of the following best illustrates iterative learning in adaptive management? Correct answer: **B**
3. How does collaboration among stakeholders contribute to adaptive management? Correct answer: **C**
4. What is a key aspect of flexibility in adaptive management? Correct answer: **A**
5. How can adaptive management principles help build resilience to climate change? Correct answer: **A**

Scoring: Each correct answer earns 1 point. Total Score: 5 points.

A score of 4-5 indicates strong understanding, 2-3 suggests partial comprehension, and 0-1 shows a need for further review.

Both correct and incorrect answers do provide feedback.

Skills/Abilities developed

- Adaptability
- Flexibility
- Resilience with respect to climate change

Further readings, activities, materials, best practices

Hallegatte, Stephane, Rentschler, Jun, and Rozenberg, Julie. (2020). *Adaptation Principles: A Guide for Designing Strategies for Climate Change Adaptation and Resilience*. Washington, DC: World Bank. Available at: www.worldbank.org.
Materials below: Presentation "Adaptive Management"



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Module 6: Adaptive Management and Flexibility

Submodule 6.1: Flexibility: Developing Adaptive Skills





CONTENTS

- Adaptive management in a nutshell
 - AM applied to resilience to climate change
 - Discussion and Reflection on AM:
 1. For group discussion
 2. For individual reflection

ADAPTIVE MANAGEMENT

WHAT

A dynamic approach to decision-making that emphasizes flexibility, iterative learning, and evidence-based strategies to address uncertainty and complexity

WHY

To improve outcomes by adapting to changing circumstances and incorporating feedback into strategies, especially in complex and unpredictable environments like climate resilience

WHO

Practitioners, organizations, and leaders across various sectors, including environmental management, urban planning, and disaster response

WHERE

Applied in contexts that require managing dynamic systems, such as ecosystems, communities, or industries impacted by climate change

WHEN

Most effective when uncertainty is high, conditions are evolving, and solutions require ongoing refinement based on feedback and new data

When applied to resilience with respect to climate change



- Adaptive learning helps communities, organizations, and systems respond to the unpredictable and evolving impacts of climate change.
- It emphasizes the importance of learning from past actions, engaging stakeholders collaboratively, and remaining flexible to adjust strategies based on real-time conditions.
- This approach is crucial in managing risks, reducing vulnerabilities, and ensuring long-term sustainability in the face of increasing climate-related uncertainties.



Group discussion

1. What are some real-world examples of adaptive management you can think of, and how do they align with the principles discussed in the webinar?

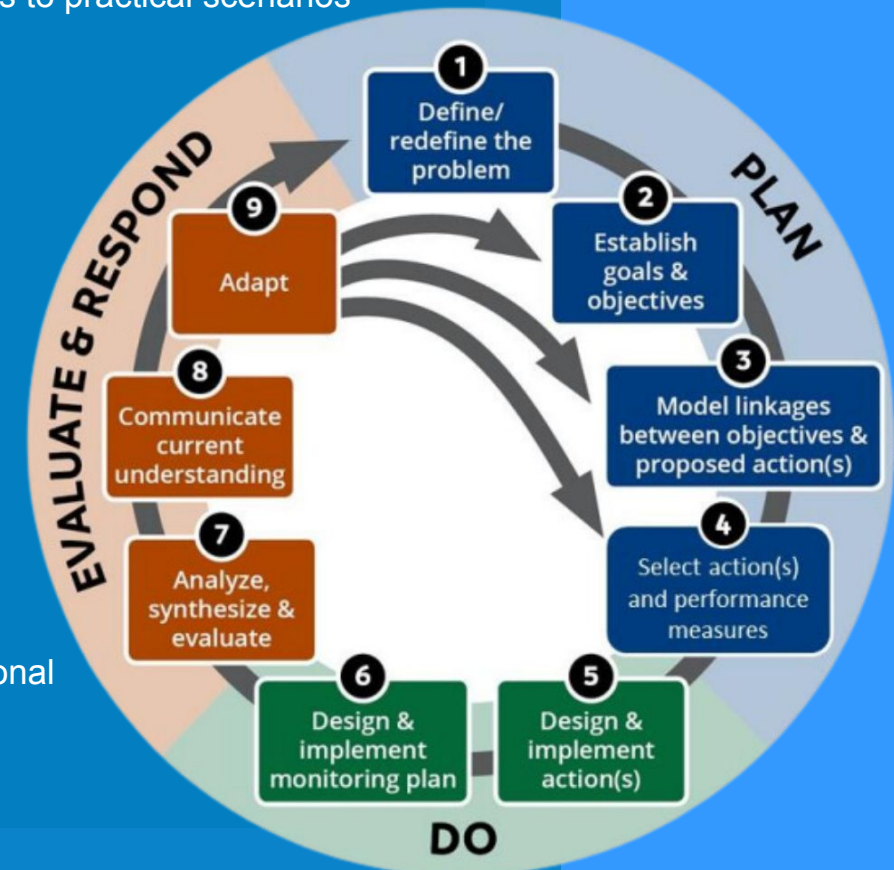
→ Analytical thinking and ability to relate theoretical principles to practical scenarios

2. What challenges might arise when implementing adaptive management, and how can they be addressed?

→ Problem-solving and critical thinking in identifying barriers and proposing actionable solutions.

3. How can you integrate adaptive management principles into your daily work or life?

→ Strategic application and personal adaptability in professional or personal contexts.



Individual reflection

1. **Reflect on the webinar: Which principle of adaptive management resonated most with you, and why?**

→ Self-reflection and deeper understanding of individual connections to core principles

2. **How do you see adaptive management contributing to long-term sustainability in your field?**

→ Strategic thinking and ability to connect principles of adaptability to broader systemic goals

3. **If you were to share one takeaway from the webinar with a colleague, what would it be?**

→ Communication and summarization skills for effectively conveying complex concepts





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Submodule 6.2

Agriculture And Forestry Management: Sustainable Practices In Food Production And Forestry

→ **Skills:**

1. Agricultural management
2. Forestry management
3. Sustainable practices

AGRICULTURE AND FORESTRY MANAGEMENT: SUSTAINABLE PRACTICES IN FOOD PRODUCTION AND FORESTRY
Activity 1 - Smart Farming
Duration: 1.5 h
Specific Learning Objectives To develop an in-depth understanding of modern agricultural systems, practices, and technologies aimed at increasing productivity while ensuring environmental stewardship. <ol style="list-style-type: none">1. Agricultural management2. Forestry management3. Sustainable practices
Methodology, Resources and Devices Frontal learning, discussion. Tools: Slides
Description of the activity and Key Concepts The sub-module aims at presenting Agricultural management, forestry management and sustainable practices. A definition of agricultural management is evidenced, together with the concept of farm management, the complexity of the mix of variables to be accounted is briefly addressed. Agricultural management methods are exemplified, and a framework definition is provided. Sustainable practices are introduced through the presentation of best practices in resource management. Forestry management is introduced and the link with the lack of sustainability is established.
Assessment Google Form: closed option questionnaire E.g.: Q1: Does Agricultural management cover crop profitability? Y/N Q2: Does Agricultural management affect soil bioavailability? Y/N Q3: Is Deforestation the result of Degradation unchecked? Y/N

Skills/Abilities developed

- Agricultural management: gain knowledge in efficient and sustainable farming practices, and the use of modern technologies to enhance productivity and environmental care.
- Forestry management: learn sustainable methods for managing forest resources, including forest ecology, inventory techniques, reforestation, and policy understanding to balance conservation and resource use.
- Sustainable practices: understand and apply eco-friendly, economically viable, and socially responsible methods in land use.

Further readings, activities, materials, best practices

[https://www.pvpc.org/sites/default/files/files/PVPC-Agricultural%20BMPs\(1\).pdf](https://www.pvpc.org/sites/default/files/files/PVPC-Agricultural%20BMPs(1).pdf)

Materials below: Presentation “Agriculture and Forestry Management: Sustainable practices in food production and forestry”



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Agriculture and Forestry Management: Sustainable practices in food production and forestry

Sub-module
6.2



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Agricultural management

Covers a complex array of variables:

How to breed and cultivate animals, aquaculture, crops

**Taking into account finance and economics, labor, environment,
and ethics**

Reference Neil W. Smith, 2016



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

What is at stake in agricultural management?

- soil fertility,**
- crop profitability,**
- agribusiness resilience,**
- sustainability**

Reference FarmERP



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

What is farm management?

It is the process of planning and implementing various tasks in farming to achieve efficiency and profitability, all tailored to the type of land, climatic conditions, seasons, farming needs of different types of crops

Furthermore, **successful agricultural management needs to be aware of farm policies, market prices, agricultural economics, sustainability measures, policy framework.**

Various agriculture management systems work in coordination to make farms more productive, sustainable, resistant, and profitable. It also determines how resources will be allocated, activities performed, as well as monitoring of performance to understand how to implement future changes

Reference farmERP

6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Farm management definition

farm management, making and implementing of the decisions involved in organizing and operating a farm for maximum production and profit. Farm management draws on agricultural economics for information on prices, markets, agricultural policy, and economic institutions such as leasing and credit. It also draws on plant and animal sciences for information on soils, seed, and fertilizer, on control of weeds, insects, and disease, and on rations and breeding; on agricultural engineering for information on farm buildings, machinery, irrigation, crop drying, drainage, and erosion control systems; and on psychology and sociology for information on human behaviour. In making his decisions, a farm manager thus integrates information from the biological, physical, and social sciences.

Reference Britannica

6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

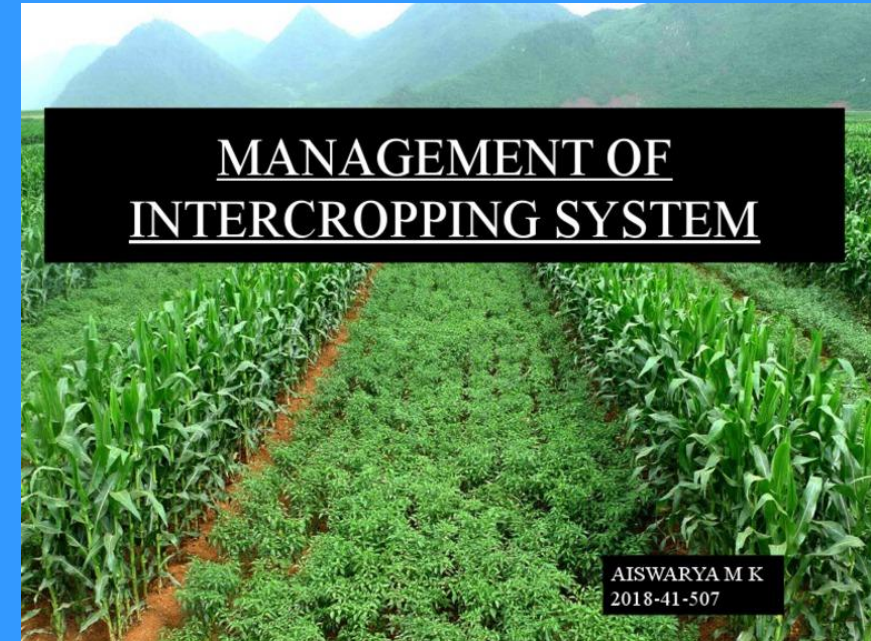
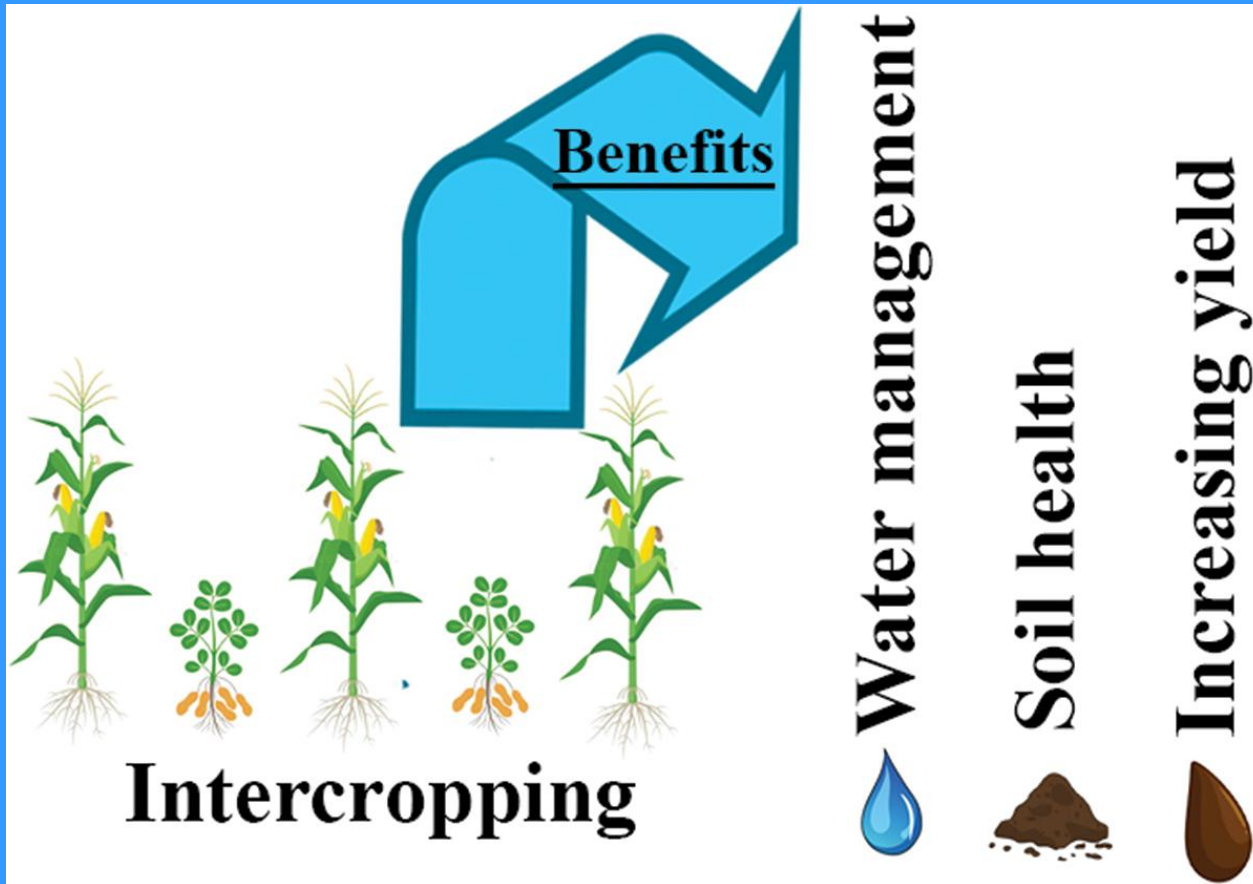
Agricultural management methods
to affect soil bioavailability

- intercrop management,
- rotation,
- tillage patterns,
- irrigation

Reference Nanda, Bhagat et al, 2022

Bioavailability: the amount of an element or compound that is accessible to an organism for uptake or adsorption across its cellular membrane

6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

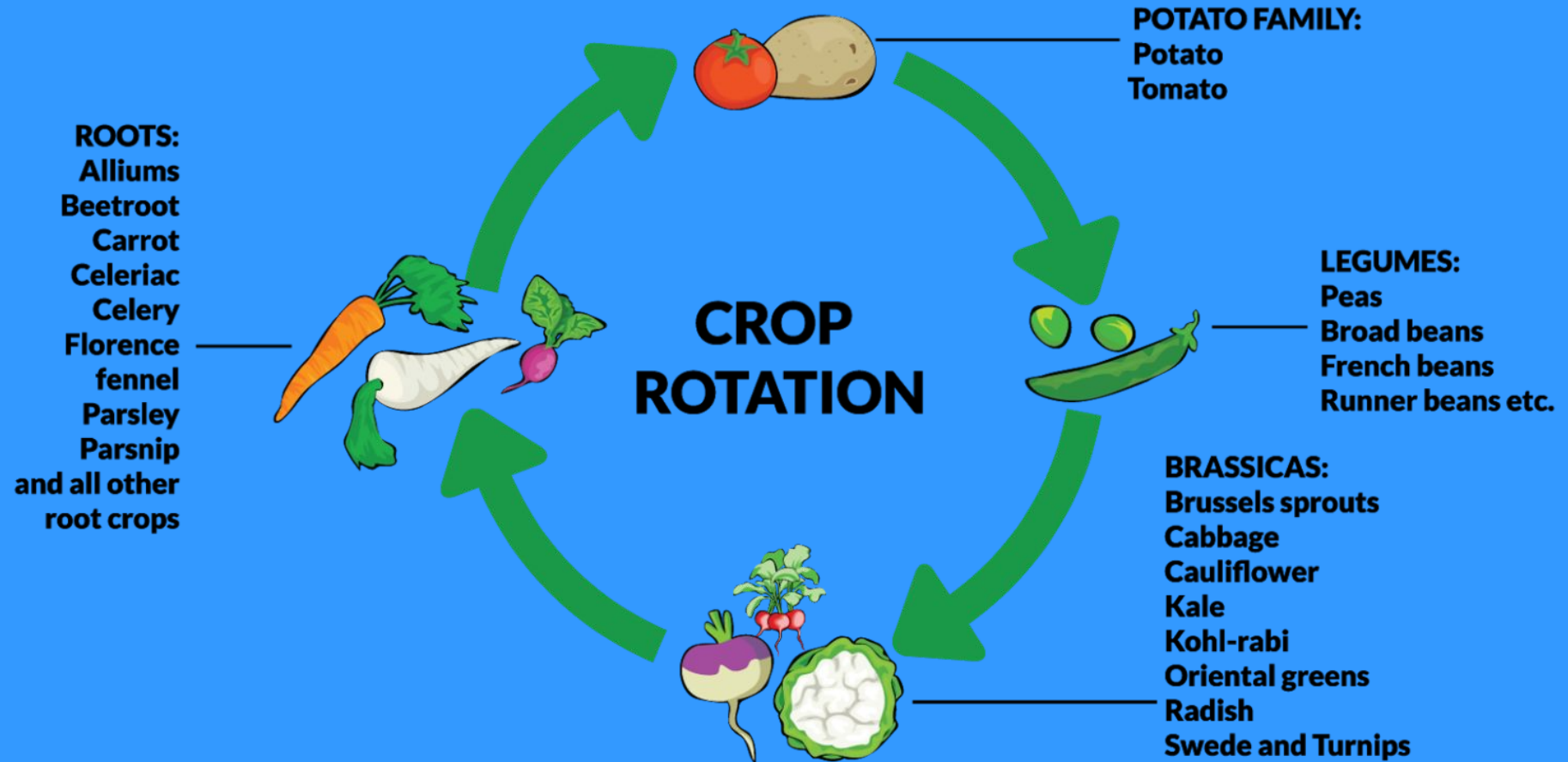


INTERCROPPING

- Intercropping is defined as the agronomic practice of growing two or more crops on the same field at the same time.
- Intercropping is as a multiple cropping system, in which two or more crops species planted simultaneously in a field during a growing season.
- It is a way to increase diversity in an agricultural ecosystem.

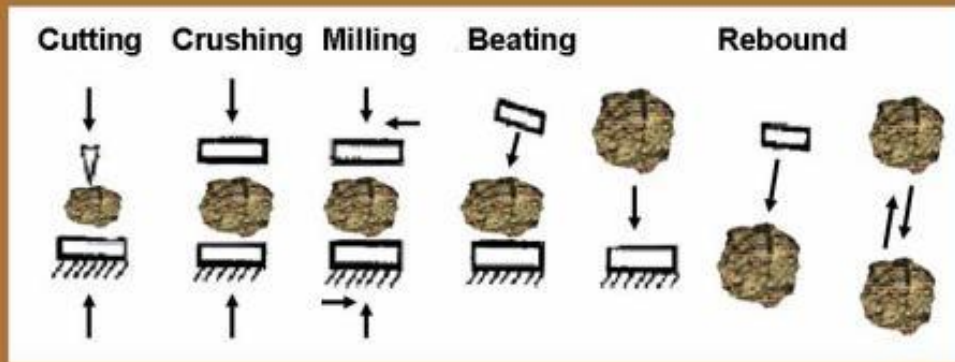


6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

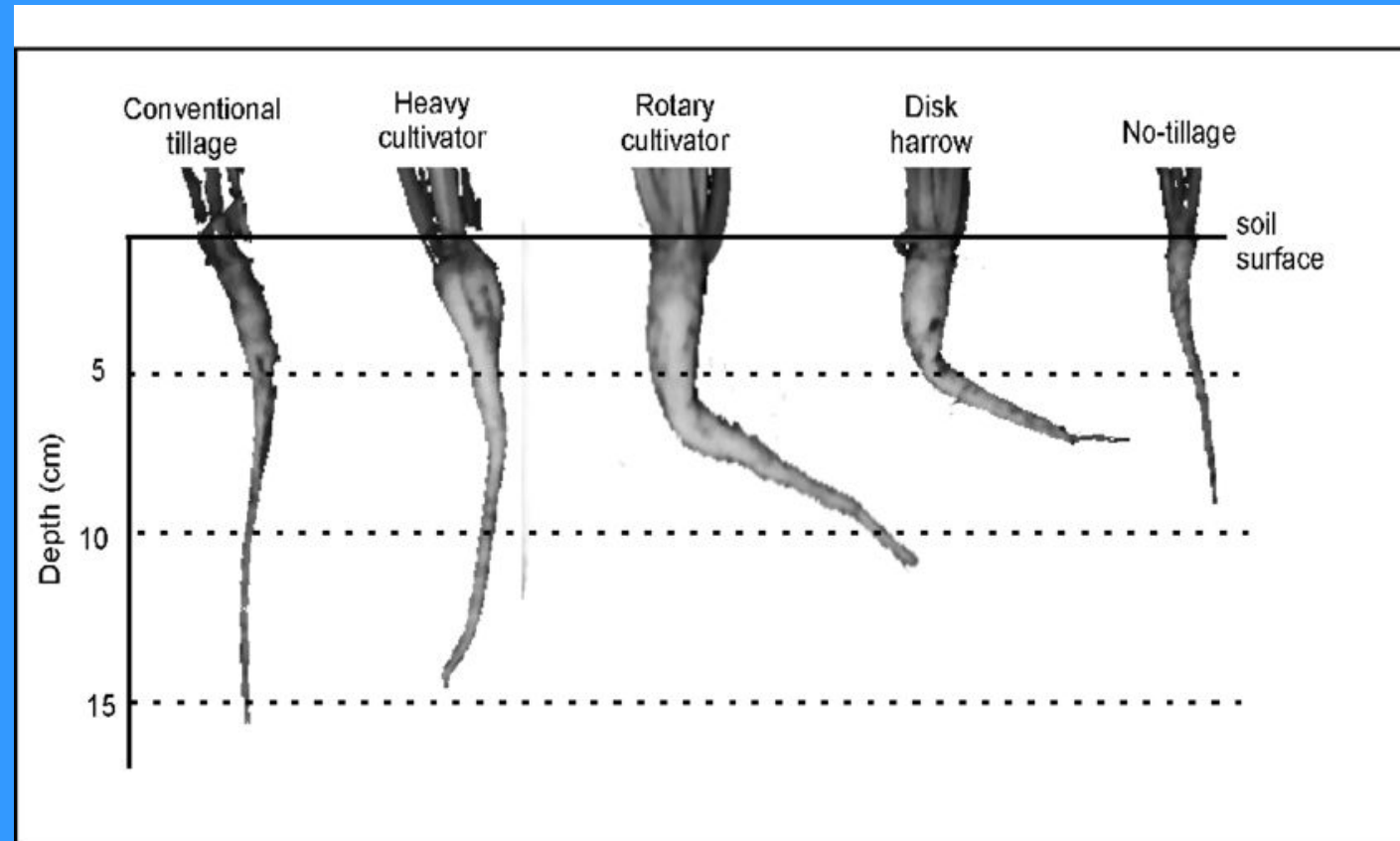


6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

What is tillage ?



Mechanical modification of soil structure



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry





6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Agricultural management method:
innovative strategies, technological solutions, and sustainable
approaches to optimize productivity, efficient crop management and
resource utilization

Reference TracexTech

6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Best practices:

1. Precision Farming

Precision farming is like giving your crops a personalized care plan. By using technology such as GPS, drones, and soil sensors, farmers can gather data about their fields and make informed decisions. This means you can apply the right amount of water, fertilizers, and pesticides exactly where they're needed, optimizing resource usage and boosting crop yields.

Reference TracexTech



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Best practices:

2. Sustainable Agriculture

working in harmony with nature, using eco-friendly methods that minimize environmental impact, such as rotating crops, planting cover crops, and reducing chemical inputs. By nurturing the soil and promoting biodiversity, sustainable farming can lead to healthier ecosystems.

Reference TracexTech



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Best practices:

Soil Health Management

Healthy soil is the foundation of successful farming. Soil health management involves practices such as adding organic matter (like compost or manure), reducing tillage, and planting cover crops to enhance soil fertility and structure. By focusing on soil health, farmers can improve water retention, promote beneficial microorganisms, and increase nutrient availability for plants

Reference TracexTech



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Forest Management

Forest management, or forest resource management, refers to any planned human intervention in a forest ecosystem to achieve specific goals and objectives, which can typically be grouped as environmental, economic, and social

Reference Forest Stewardship Council



6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Forest Management

Natural sustainable ecosystems provide the biological basis of forest biodiversity, its functions, and growth cycles. When forest biodiversity is based on man's intervention, it is called sustainable forest management

Reference European Commission

6.3 Agriculture and Forestry Management: Sustainable practices in food production and forestry

Forest Management: when is not sustainable?

Where sustainable forest management is not practised or where natural forests are damaged by human intervention, unsustainable forestry occurs in three stages:

- **Degradation** is the initial phase in which natural forests become damaged, either by unsustainable logging (tree removal in an unselective or concentrated way so that the original forest canopy cannot recover) or by competing land uses such as mining, infrastructure, agriculture, and the resettlement of populations. Often these occur in combination.
- **Deforestation** occurs if degradation goes unchecked. Most or all forest cover is lost. If left undisturbed and not eroded by the elements, many deforested areas can partially or fully recover to their former state. More often however, the pressures from other land use prevents this and result in permanent deforestation.
- **Desertification** happens in areas where the forest cover (continuous canopy) is largely or totally lost and climatic conditions (rain, wind, snow, etc.) intervene destructively so as to impoverish, deplete, or remove soil.



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Submodule 6.3

Coping With Uncertainty: Strategies To Manage Ambiguity And Risk

→ **Skills:**

1. Risk management
2. Uncertainty management

COPING WITH UNCERTAINTY: STRATEGIES TO MANAGE AMBIGUITY AND RISK
Activity 1 - Managing Risk and Uncertainty: Introduction to ISO 31000
Duration: 1.5 h
Specific Learning Objectives <ol style="list-style-type: none">1. Risk management2. Uncertainty management
Methodology, Resources and Devices Frontal learning, discussion. Tools: Slides
Description of the activity and Key Concepts The sub-module aims at delivering key competences to deal with uncertainty, ambiguity and risk, while introducing ISO31000 as a risk management example. Risk is defined, risk management is outlined as the process of identifying, assessing and controlling financial, legal, strategic and security risks to an organization's capital and earnings, uncertainty management is then introduced and defined.
Assessment Google Form: closed option questionnaire E.g.: Q1: Is Risk the possibility of something bad happening? Y/N Q2: Are Positive Risks possible? Y/N Q3: Risk management solely analyzes threats? Y/N Q4: Can an organization get a certification for ISO31000? Y/N
Skills/Abilities developed <ul style="list-style-type: none">● Identify and assess risks using structured frameworks like ISO 31000.● Develop strategies to control and mitigate financial, legal, and strategic risks.● Understand and manage uncertainty in unpredictable or ambiguous situations.● Make informed decisions with limited or evolving information.● Adapt to change and build resilience in dynamic environments.

Further readings, activities, materials, best practices

Presentation “Coping with Uncertainty: Strategies to manage ambiguity and risk”



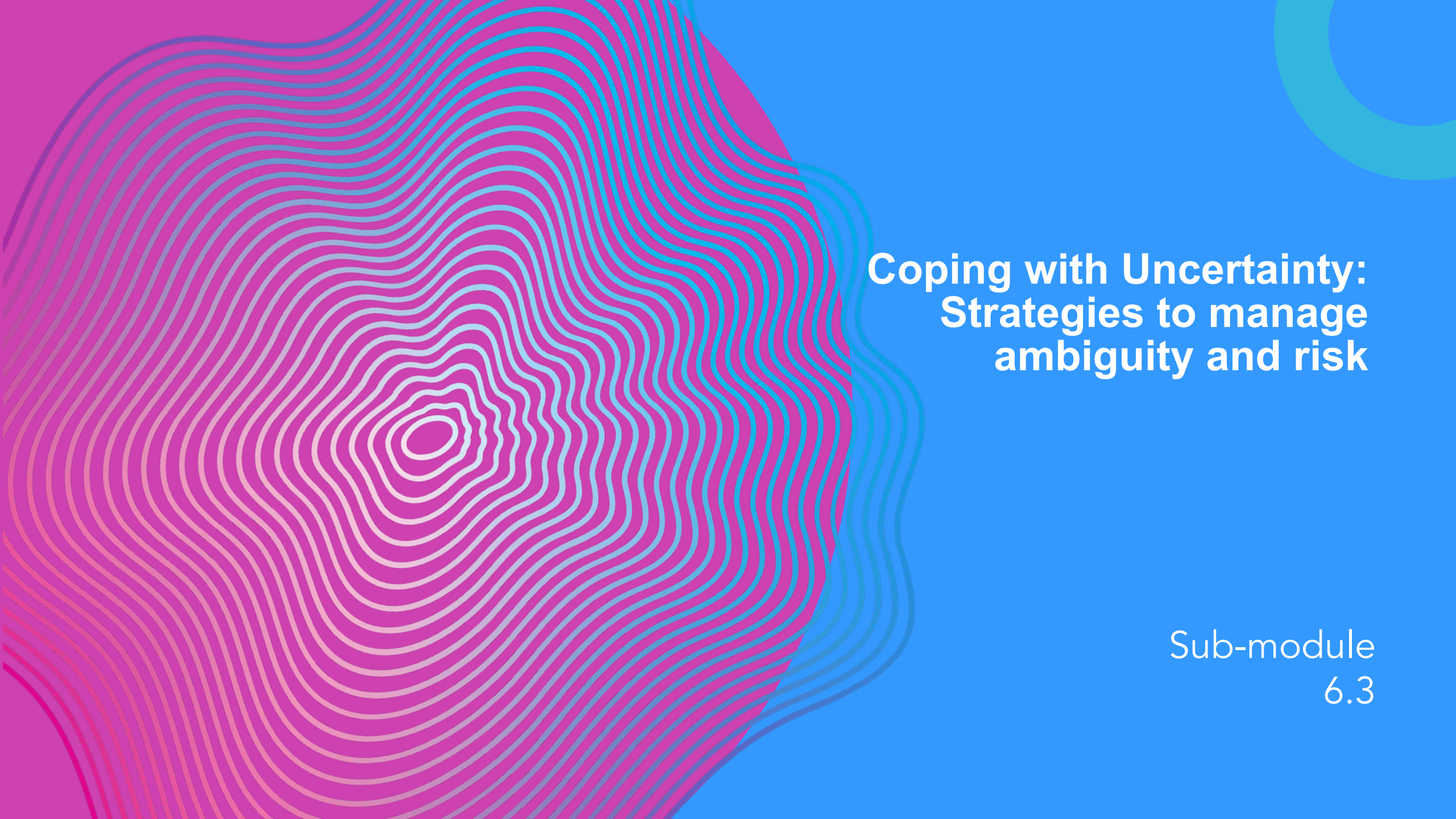
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Coping with Uncertainty: Strategies to manage ambiguity and risk

Sub-module
6.3



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

RISK [definition]: the possibility of something bad happening

the possibility that an event will adversely affect the achievement of ones' objective

Reference DICTIONARY



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

RISK MANAGEMENT

Risk management is the process of identifying, assessing and controlling financial, legal, strategic and security risks to an organization's capital and earnings.

Reference IBM

6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

RISK MANAGEMENT

Risk management is the process of identifying, assessing and controlling threats to an organization's capital, earnings and operations. These risks stem from a variety of sources, including financial uncertainties, legal liabilities, technology issues, strategic management errors, accidents and natural disasters.

A successful risk management program helps an organization consider the full range of risks it faces.

Risk management also examines the relationship between different types of business risks and the cascading impact they could have on an organization's strategic goals.



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

RISK and RISK MANAGEMENT

How to cope?

Do you always avoid RISKS?



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

ENTERPRISE RISK MANAGEMENT

understand and manage risk in a holistic manner across an organization:
Internal and external risk, threats, positive risks.

Positive risks are opportunities that could increase business value or, conversely, damage an organization if not taken.

Reference Tech Target



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

RISK MANAGEMENT aims at making smart decisions not eliminating risks.

"We don't manage risks so we can have no risk. We manage risks so we know which risks are worth taking"

Reference Tech Target

6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk





6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

ISO: INTERNATIONAL STANDARDIZATION ORGANIZATION

ISO 31000 was developed by ISO's risk management technical committee with input from ISO national member bodies and released in 2009 (revised in 2018). ISO standard includes a list of Enterprise Risk Management principles, a framework to help organizations apply risk management mechanisms to operations, and the process detailed above for identifying, evaluating and mitigating risks.

Reference Tech Target



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

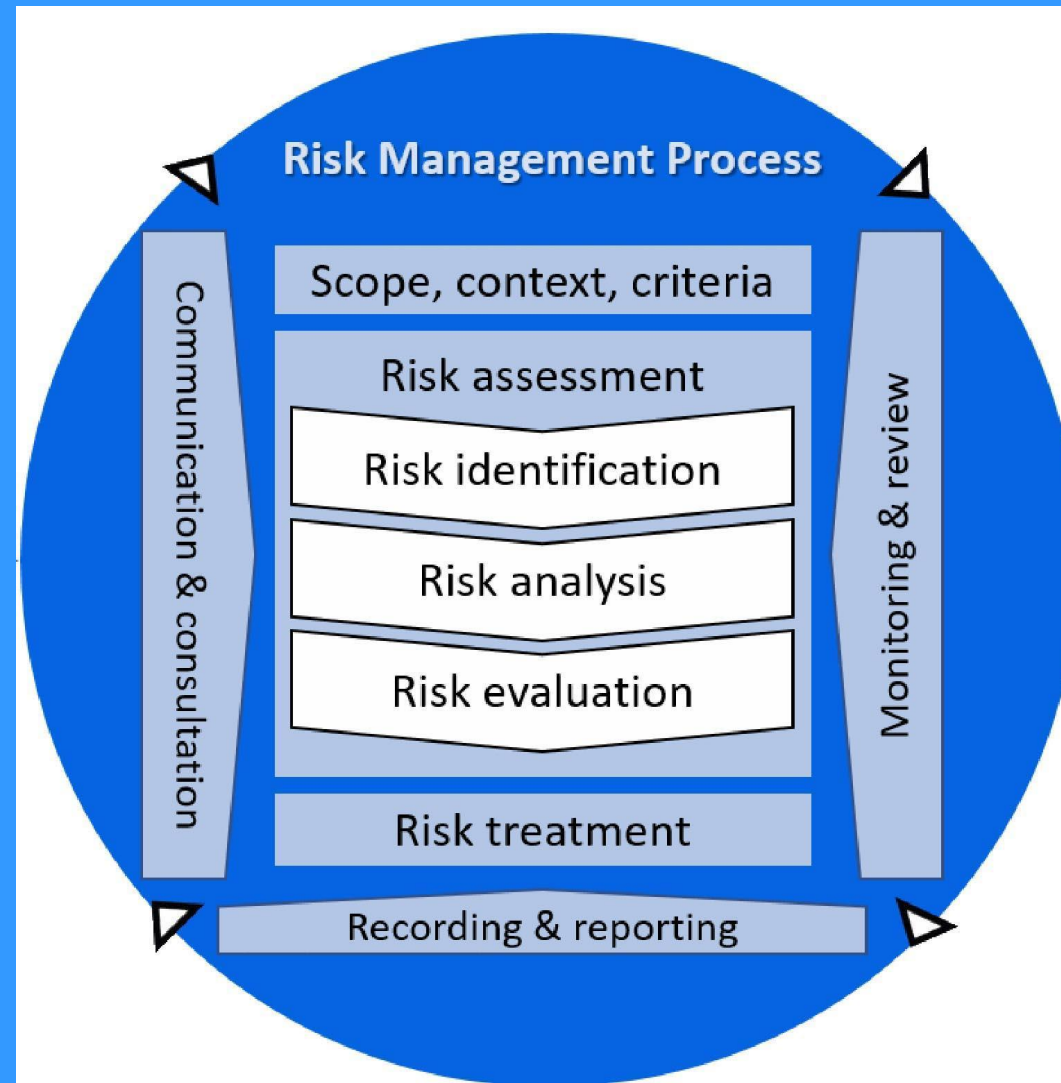
ISO: INTERNATIONAL STANDARDIZATION ORGANIZATION

What is ISO 31000?

ISO 31000 is an international standard that provides principles and guidelines for risk management. It outlines a comprehensive approach to identifying, analyzing, evaluating, treating, monitoring and communicating risks across an organization.

Reference ISO

6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

ISO 31000 outlines a risk management process that can be used by any type of entity and includes the following steps for identifying, assessing and managing risks:

1. Identify the risks faced by your organization.
2. Analyze the likelihood and possible impact of each one.
3. Evaluate and prioritize the risks based on business objectives.
4. Treat -- or respond to -- the risk conditions.
5. Monitor the results of risk controls and adjust as necessary.



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

ISO 31000 provides principles, a framework and a process for managing risk. It can be used by any organization regardless of its size, activity or sector.

Using ISO 31000 can help organizations increase the likelihood of achieving objectives, improve the identification of opportunities and threats and effectively allocate and use resources for risk treatment.

However, ISO 31000 cannot be used for certification purposes, but does provide guidance for internal or external audit programmes. Organizations using it can compare their risk management practices with an internationally recognized benchmark, providing sound principles for effective management and corporate governance.



6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

UNCERTAINTY MANAGEMENT

UNCERTAINTY [definition]

a situation in which something is not known, or something that is not known or certain (Cambridge dictionary)

a situation in which something is not known, or something that is not known or certain (Collins dictionary)

uncertainty ranges in implication from a mere lack of absolute sureness to such vagueness as to preclude anything more than guesswork

6.4 Coping with Uncertainty: Strategies to manage ambiguity and risk

UNCERTAINTY MANAGEMENT

UNCERTAINTY MANAGEMENT [definition]

uncertainty management is the process by which individuals create meaning or understanding in situations in which something unpredictable, unusual, unexpected, or out of the ordinary occurs and when there is a need to determine the appropriate meaning.

Uncertainty management involves strategies and processes to minimize the impact of unpredictability in decision-making, essential for business operations, risk assessment, and project planning. Key techniques include risk analysis, adaptive planning, and employing flexible frameworks to anticipate potential future scenarios. Engaging with uncertainty management effectively helps organizations navigate challenges and capitalize on opportunities

Reference Studysmarter.uk



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