Green Agri-Food production

Green Agri-Food refers to the production of agricultural and food products using methods that are environmentally sustainable, economically viable, and socially responsible.

This approach aims to minimize the environmental footprint of food production while ensuring food security, promoting biodiversity, and supporting the well-being of rural communities. Meanwhile, we have a very important question: which is the green food sector? According to the European Commission in the field of Vocational education and training it was elaborated that the agri-food sector is the combination of activities undertaken in the agriculture and food manufacturing sectors with links to the wholesale and retail distribution of food and drink. The sector includes agriculture, horticulture, food and drink processing and also activities in their value chains, ranging from agricultural production to food manufacture and consumption. The wholesale and retail trade of food and drink, although more loosely connected, are sometimes viewed as part of agri-food. Providing a job to an estimated 13.6 million people in the EU-27 in 2019, the sector accounted for about 7% of EU employment. Employment is concentrated in agricultural smallholdings and small and medium-sized enterprises (SMEs). In 2016, 2 in 3 EU agricultural holdings were less than 5 hectares in size, and 57% of food manufacturers employed fewer than 250 employees (compared to 50% across all manufacturing) in 2019. The agricultural part of agri-food has many family workers and people holding other jobs outside the sector (e.g. weekend farmers), although there are large-scale producers as well. The sizable seasonal/temporary workforce is often engaged in low-wage, precarious employment and has many migrants.

Photo: Retrieved from Canva, 2024

TB-GOBRA's research was thorough regarding the educational process and what could be effective information for all the VET learners out there to be aware of. It led to some major bullet points to be taken into consideration when we mention the processes of green agri-food production.

Sustainable farming methods

1. Organic Farming: the focus on natural inputs and processes to maintain soil health and avoid pesticides, the usage of sustainable, healthy and organic fertilisers.
2. Permaculture: sustainable farming through proper land usage, integrating resources, amplifying human resources involvement and usage of the environment through mutually beneficial synergies, mimicking natural ecosystems.
3. Agroforestry: fostering it as part of regular agriculture works on cultivating a more diverse, productive, profitable and sustainable land use.

Resource Management

1. Water Conservation: Implements techniques such as drip irrigation, rainwater harvesting, and efficient water management to reduce water use and waste.
2. Soil Health Management: Practices like crop rotation, cover cropping, and reduced tillage enhance soil fertility and structure, reducing erosion and nutrient runoff.
3. Renewable Energy Use: Utilizes solar, wind, and bioenergy to power farming operations, reducing reliance on fossil fuels.

Photo: Retrieved from Canva, 2024

Photo: Retrieved from Canva, 2024

Integrated Pest Management (IPM)

Combines biological, cultural, physical, and chemical tools to manage pests in an economically and ecologically sound manner. This includes using natural predators, crop rotation, and resistant crop varieties.

Waste Reduction

- Composting: Converts organic farm waste into valuable compost, improving soil health and reducing the need for chemical fertilizers.
- Recycling and Upcycling: Reuses farm and food processing waste materials in innovative ways, reducing overall waste and creating value-added products.
- Efficient Supply Chain Management: Minimizes food loss and waste from production to consumption through better logistics, storage, and processing techniques.

Biodiversity Enhancement

- Polyculture: Cultivates multiple crop species in the same space to enhance biodiversity, improve soil health, and reduce pest outbreaks.
- Habitat Conservation: Protects natural habitats and promotes the presence of beneficial organisms, such as pollinators and natural pest predators.

Economic and Social Practices

- Fair Trade and Ethical Practices: Ensures fair wages, safe working conditions, and equitable treatment for farm workers.
- Community Engagement and Education: Involves local communities in decision-making and provides education on sustainable practices.

List of Activities
Green Agri-Food Production

JEOPARDY

This activity is a quiz model designed to be used as a theoretical introduction to the subject of food and sustainability. The aim is to provide a common basic knowledge to start from a similar level and ensure that all learners and beneficiaries have a decent depth into the subject.

ECO-STRATEGY SIMULATION

The idea is to create very sustainable strategies for working with different kinds of cases in order to enhance critical thinking and teamwork efficiency.

WASTE WIZARD WORKSHOP

The Wizards aim to reduce waste and how to highlight agriculture waste to increase awareness about recycling techniques.

GREEN THUMB GARDEN CHALLENGE

This activity focuses on sustainable farming highlighting team-building and shared tasks and biodiversity.

Biodiversity Role Play

Resource Management Relay

Sustainable Supply Chain Challenge

Eco-Innovation Hackathon

The activities are aiming to a very concrete methods focusing on green agri food production and agriculture adaptability.

Photo: Retrieved from Canva, 2024

JEOPARDY

Why:

1. To create a common understanding of basic ideas about food sustainability in addition to a deeper understanding of coherent and strong teamwork concepts.
2. To give general knowledge about the consumption and production of food and suppliers
3. To create a vibrant environment where VET learners seek team building as a tool for upskilling their work skills.

Instructions

- Step 1 participants are divided into six different teams. The facilitation team sends the link to the jeopardy quiz prepared using the Kahoot website.
- Step 2 by turns, each team chooses a category and a level of difficulty. If they answer correctly, they gain points. If they answer wrong, they lose the same amount of points, and the facilitator opens the 'buzzing time' allowing the other teams to buzz and answer. Once a correct answer has been given, or once all the groups have answered incorrectly, the facilitation team shows the correct answers and explains the concept.
- Step 3 Once all the questions have been answered, a debriefing session is held. The facilitation team asks questions related to the content learned, in order to verify that the concepts are clear, and that everyone is on the same page.

Photo: Retrieved from Canva, 2024

Evaluation:

Food I

Which is the country with the highest per-person tea consumption rate in the world?

a. United kingdom
b. Turkiye
c. Norway
d. India

- **Turks** per person drink almost 3 kg of tea every year.

which cooking spice is known for being a strong hallucinogen?

- **Nutmeg**!

Which food were ancient civilizations of mexico and south america using as a currency?

- aztecs and mayans used **cocoa beans** as a money system

which country produces the most expensive coffee in the world?

- **Indonesia**

Food II

How do you check if eggs are still fresh?

- In a glass of cold water. **The fresher the egg, the faster it will fall to the bottom!** Any eggs that float should be thrown out.

What is vinaigrette? What are the basic ingredients?

- **Emulsion** of oil and **vinegard/lemon** juice. **Proportion is 3:1**

Which european country consumes the most meat per person?

- **Spaniards** take first place, followed by Portugal.

Can you describe what's the process for making olive oil?

- **This is how we do it in la buona terra!**

Evaluation:

Food & environment

Which of the following has the highest carbon footprint?

1. Banana
2. Beef
3. Chocolate
4. Palm oil

Beef has the highest carbon footprint of any food (59.57 kg per kg of food). This is because of what is required to raise and farm cattle. Animals used for beef production require a tremendous amount of feed, which must be grown on its own. They also produce an extremely high amount of methane.

How many cups of water does it take to make the beans for your cup of coffee?

1. 10 cups
2. 100 cups
3. 1000 cups
4. 10000 cups

It takes over **1000 cups** of water to make the coffee for your cup. And 50 cups for a spoonful of sugar. Considering that one cup of water is 0.23 lt, this means that one cup of coffee would take more than 236 lt of water to be produced.

How much of the world's land area is used for agriculture?

- **Over 50% of the land area (51 million km2)** is used for agricultural purposes.

What’s the per capita food waste per year in the eu (in kg)?

- In 2020 **around 127 kilogrammes (kg)** of food per inhabitant were wasted in the eu. Households generated 55% of food waste, accounting for 70 kg per inhabitant. The remaining 45% was waste generated upwards in the food supply chain.

In which of these foods would you find the energy-boosting mineral, iron?

1. Orange
2. Spinach
3. Carrot
4. Pasta

No matter how you prepare it, **spinach** is an excellent source of iron!

"globally, hunger is more common than obesity" true or false?

- **False**. More people are obese than underweight. Worldwide, 39 per cent of all adults are overweight and 13 per cent are obese. This increases the risk of heart disease, stroke, musculoskeletal disorders and some cancer, and results in at least 2.8 million deaths every year

Which are the five major types of nutrients present in food?

- Proteins, carbohydrates, fats, vitamins and minerals.

What is the recommended maximum amount of added sugars to consume per day?

- It's suggested a strict added-sugar limit of no more than **100 calories per day** (about 24 grams) for most adult women and no more than **150 calories per day** (about 36 grams of sugar) for most men.

Photo: Retrieved from Canva, 2024

Materials

- Phone or Laptop
- Screen/projector
- Flipchart and Markers

Timing: 1:30 hours

Visuals: Links provided in the questions related

Obstacles

- Participants might be not aware of the questions, and it is a bit difficult to predict the answers
- Time Management might be tricky because if we use a tool such as Kahoot it will make the activity super short but if we divide the participants in groups and use flip charts it will be extended long.

Evaluation rules

- The evaluation will be based on debriefing and communication either in groups or in peer to peer reviews about the gained knowledge and how we can relate these ideas to the sector of food production in the agri-food sector.
- Decision-Making Quality: Evaluate based on the sustainability and effectiveness of chosen strategies.
- Team Collaboration: Observe teamwork and communication.
- Presentation Clarity: Assess the clarity and coherence of the final presentations.

Transferability rules

- The trainer can easily after the workshop based on the time margin to divide the participants into groups and ask each group to create sustainable ideas on Agri-Food productions using the input from the Qs and As.
- The trainer can transform the groups into a world cafe style after the Qs and As and ask participants four questions: 1. How the input of the As can impact the agri-food industry? 2. How critical is the market of agrifood relying on mass production? 3. What are the Pros and Cons of Green Agri-food Productions? 4. How does green agri-food production contribute to climate change, an environmental revolution and who can be the main contributors to it?

Preparation:

- Green-Themed Categories: Before the activity, design the Jeopardy categories to reflect green values related to food sustainability. For example:
  - Sustainable Farming Practices
  - Organic vs. Conventional Food
  - Reducing Food Waste
  - Local and Seasonal Eating
  - Eco-Friendly Food Packaging
  - Impact of Food Miles
- Briefing on Green Values: Begin with a brief introduction that highlights the importance of sustainability in food production and consumption. Emphasize how the quiz will not only test their knowledge but also help them understand and apply green values in real-life situations.

Step 1: Team Formation and Initial Guidance

- Team Composition: Form diverse teams with a mix of skills and knowledge levels to foster peer learning. Encourage them to think about how their answers relate to sustainability in real-world scenarios.
- Initial Guidance: Remind the participants to consider sustainability in every answer they give. Encourage them to think critically about how each concept impacts the environment, society, and economy.

Photo: Mahmoud ElSayed, 2024

Step 2: Quiz Participation

- Sustainability Focus: During the quiz, as teams select categories and answer questions, the facilitator should prompt them to explain how their answers connect to sustainable practices in agri-food production. For example, after a correct answer, ask, "How does this practice contribute to reducing our carbon footprint?"
- Buzzing Time Integration: During the buzzing time, after a team answers incorrectly, take a moment to discuss the environmental implications of the correct answer. Use this time to deepen their understanding of the connection between the quiz content and green values.

Step 3: Debriefing and Reflection

- Content Review: After the quiz, hold a debriefing session where you go over the key concepts.
- Reflective Discussion: Encourage participants to discuss how the quiz content can be applied to their future careers in agri-food production.

Photo: Mahmoud ElSayed, 2024

ECO-STRATEGY SIMULATION

Why

- Enhanced Critical Thinking: Encourages strategic decision-making and resource management.
- Collaboration: Fosters teamwork through joint problem-solving.
- Real-world Application: Provides practical insights into sustainable farming practices.

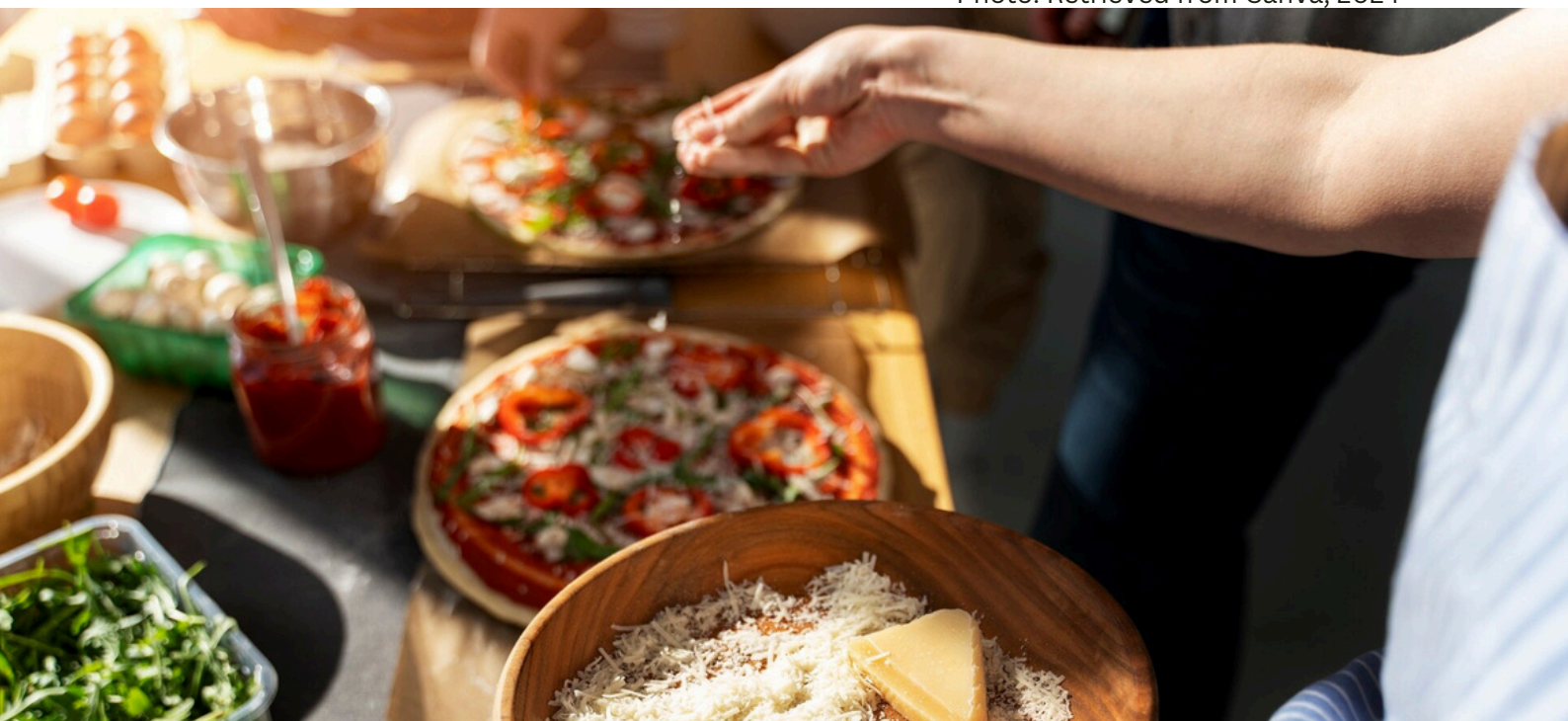
Instructions

1. Divide the group into four teams.
2. Distribute **scenario cards** detailing farm conditions (e.g., soil health, water availability).
3. Provide **tokens** representing resources (water, soil nutrients, energy).
4. Teams decide on sustainable practices to implement each round (e.g., crop rotation, water conservation).
5. Use tokens to track resource usage and improvements.
6. After several rounds, teams present their outcomes.
7. Discuss the effectiveness of different strategies.

Materials

- Flip charts
- Markers
- Scenario cards
- Resource tokens

Photo: Retrieved from Canva, 2024



Timing: 1:30 hours

Visuals

High-quality photos of different farming scenarios and sustainable practices.

- Photo 1
- Photo 2

Obstacles

- Teams might struggle to agree on strategies.
- Resource tracking could become confusing.
- Ensure clear explanations of sustainable practices.
- Conflicts to arise due to the strategies agreements
- Time Management could be an issue due to the brainstorming on the methods

Evaluation Rules

- Debriefing and peer-to-peer review will be highly beneficial in this case to talk about the process and how can it be improved
- Decision-Making Quality: Evaluate based on the sustainability and effectiveness of chosen strategies.
- Team Collaboration: Observe teamwork and communication.
- Presentation Clarity: Assess the clarity and coherence of the final presentations.

Transferability rules

- Trainers here can focus on creating a very calm environment
- Trainers can also give small pieces of advice to the participants
- Trainers can allow internet research about elements of an agriculture background

Photo: Retrieved from Canva, 2024

Eco Strategy Simulation - Scenario Cards

Scenario Card 1: Drought Conditions

Background
Your farm is located in an area experiencing prolonged drought. Water resources are scarce, and crop yields have been declining.

Current Conditions
Water Availability: Very low
Soil Health: Moderate
Pest Levels: Low

Challenges
Ensuring adequate water for crops
Preventing soil degradation

Objectives
Implement water conservation techniques
Maintain soil health

Scenario Card 2: Soil Degradation

Background
Your farm's soil has been overworked and lacks essential nutrients. Crop productivity has decreased, and erosion is a significant concern.

Current Conditions
Water Availability: Moderate
Soil Health: Poor
Pest Levels: Moderate

Challenges
Restoring soil fertility
Preventing further erosion

Objectives
Implement soil health management practices
Increase organic matter in the soil

Scenario Card 3: Pest Infestation

Background
Your farm is dealing with a severe pest infestation. Pests are damaging crops, and yields are at risk.

Current Conditions
Water Availability: High
Soil Health: Good
Pest Levels: High

Challenges
Controlling the pest population
Protecting crops from further damage

Objectives
Implement integrated pest management (IPM) strategies
Promote biodiversity to manage pests naturally

Scenario Card 4: Resource Abundance

Background
Your farm is currently thriving with abundant resources. However, maintaining sustainability is crucial to prevent future problems.

Current Conditions
Water Availability: High
Soil Health: Excellent
Pest Levels: Low

Challenges
Ensuring long-term sustainability
Avoiding resource depletion

Objectives

Implement renewable energy solutions

Enhance biodiversity and crop diversity

nstructions for Each Scenario Card

1. Team Discussion: Discuss the current conditions and challenges of your farm.
2. Strategic Planning: Develop a plan to address the challenges using sustainable practices. Consider water conservation, soil health management, pest control, and biodiversity.
3. Implementation: Decide on specific actions to take each round (e.g., crop rotation, organic fertilizers, composting, introducing beneficial insects).
4. Resource Tracking: Use tokens to represent resource levels and track improvements or degradations based on your decisions.
5. Outcome Evaluation: After several rounds, evaluate the outcomes of your strategies. Discuss what worked well and what could be improved.
6. Presentation: Present your farm's progress and the strategies you implemented to the other teams.

Key Terms Explained

- Integrated Pest Management (IPM): A multi-faceted approach to pest control that uses biological, cultural, physical, and chemical tools to minimize pest damage in an environmentally and economically sustainable manner.
- Crop Rotation: The practice of growing different types of crops in the same area in sequential seasons to improve soil health and reduce pest and disease problems.
- Composting: The process of recycling organic matter, such as leaves and food scraps, into a valuable fertilizer that can enrich soil and plants.

Adaptations for Geographical Differences

- Water Conservation Techniques: In arid regions, focus on drip irrigation and rainwater harvesting. In areas with higher rainfall, consider efficient water management systems.
- Soil Health Practices: In regions with sandy soils, prioritize practices that enhance soil structure, like adding organic matter. In clay-heavy soils, focus on improving drainage and aeration.
- Pest Management: Adapt IPM strategies to local pest species and available biological control agents.

Sustainability Relevance

- Resource Conservation: Ensures long-term productivity and environmental health.
- Soil Health: Vital for maintaining productive agricultural systems and preventing land degradation.
- Biodiversity: Enhances ecosystem resilience and reduces dependency on chemical inputs.

Managing the class room strategy for Eco Strategy Simulations

Preparation:

- Sustainability-Oriented Scenarios: Create scenario cards that highlight common challenges in sustainable farming (e.g., drought conditions, pest management). Ensure that the scenarios require strategic decision-making that aligns with green values.

Step 1: Team Formation and Scenario Distribution

- Strategic Team Formation: Form four teams, ensuring a diverse mix of backgrounds and strengths. Distribute the scenario cards and resources (tokens) to each team.

Step 2: Implementation of Sustainable Practices

- Guided Decision-Making: Guide teams as they decide on sustainable practices to implement each round. Encourage them to consider the long-term impact of their choices on the environment and resource sustainability.
- Resource Tracking: Have teams use tokens to track resource usage, reinforcing the importance of resource management in sustainable farming.

Step 3: Presentation and Reflective Discussion

- Outcome Presentation: After several rounds, each team presents their outcomes, explaining the sustainability of their strategies.
- Reflective Assessment: Facilitate a discussion on the effectiveness of different strategies. Highlight how the choices made can be applied to real-world sustainable farming practices.

WASTE WIZARD WORKSHOP

Why

- Innovation: Promotes creative thinking in waste reduction.
- Environmental Impact: Highlights the importance of minimizing waste in agriculture.
- Practical Skills: Equips participants with actionable waste reduction techniques.

Instructions

1. Split the group into smaller teams of 5.
2. Each team brainstorms waste reduction strategies for agri-food production.
3. Teams create a presentation or demonstration of their strategies.
4. Share and discuss each team's solutions.

Materials

- Recyclable and compostable materials
- Flip charts
- Markers
- Brainstorming sheets

Timing: 1 hour

Compost Life Cycle

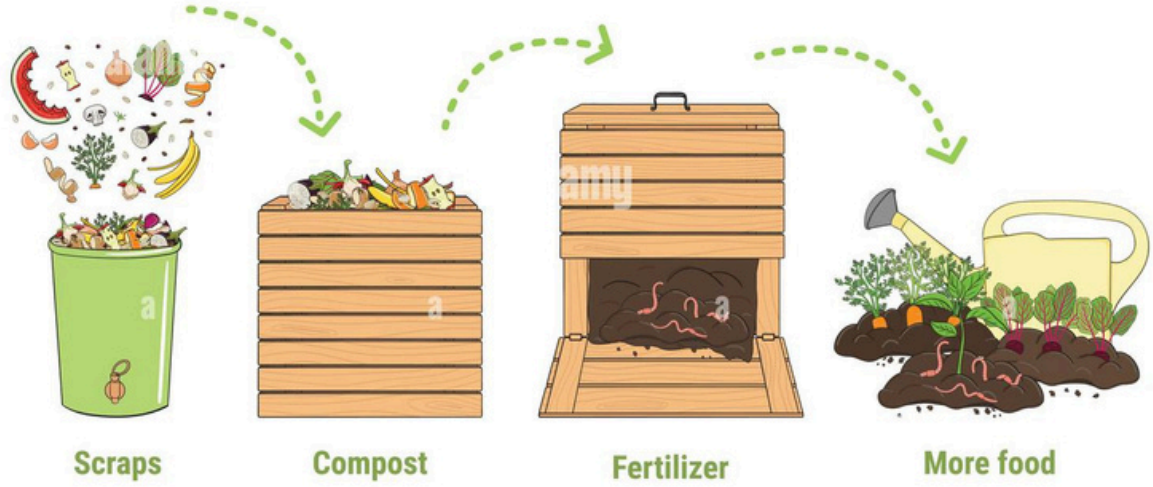


Photo: Retrieved from Canva, 2024

Visuals

Photos of recycling processes and composting techniques

Obstacles

- Teams may find it challenging to come up with ideas.
- Ensure all materials are available and explained.

Evaluation Rules

- Creativity: Evaluate innovative and practical ideas.
- Feasibility: Assess the practicality of implementing proposed solutions.
- Team Dynamics: Observe the level of collaboration.

Transferability rules

- Trainer can send the visuals to the social media groups (WhatsApp, Facebook)

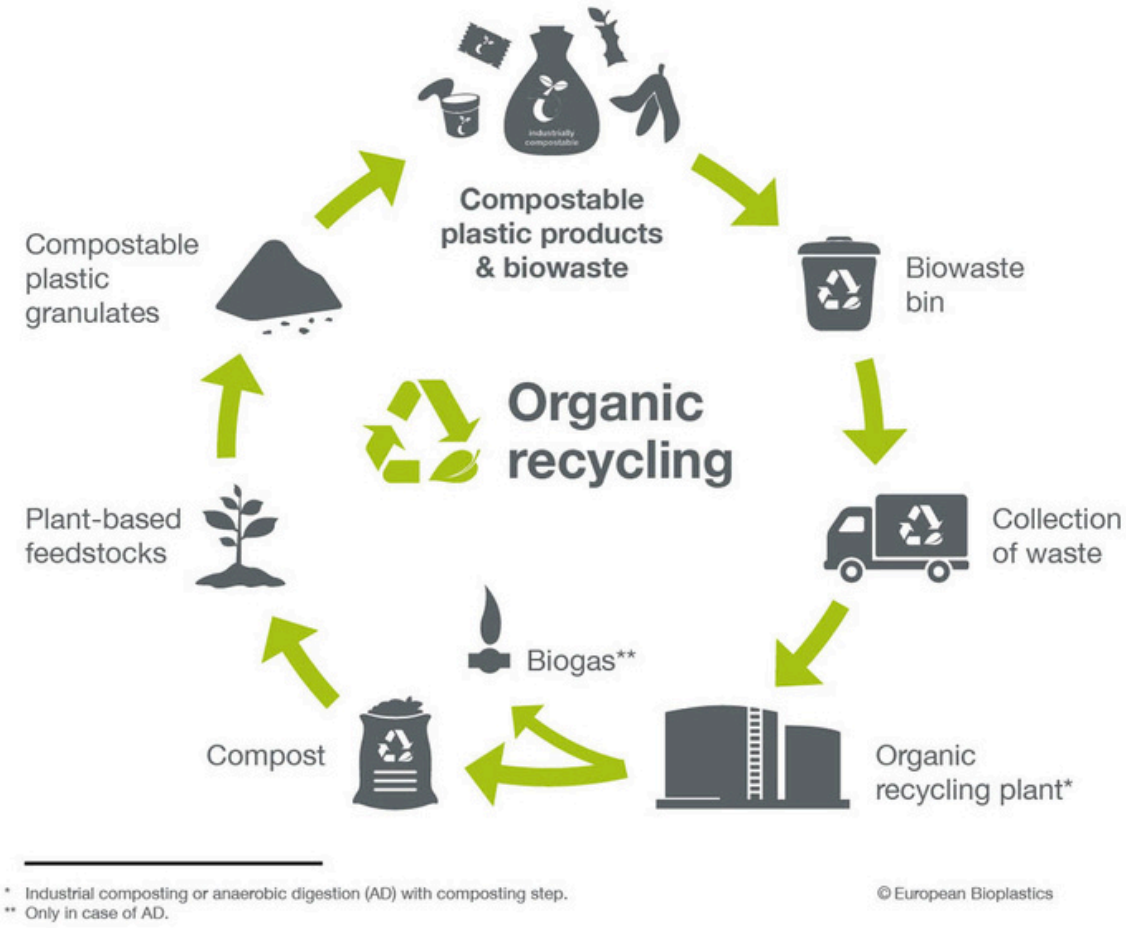


Photo: Retrieved from Canva, 2024

Managing the class room strategy for waste wizard

Step 1: Team Formation and Brainstorming

- Structured Brainstorming: Divide participants into smaller teams of five. Encourage each team to brainstorm creative waste reduction strategies, focusing on minimizing environmental impact in agri-food production. Provide prompts or examples to inspire innovative thinking.

Step 2: Presentation or Demonstration Development

- Interactive Creation: Guide teams as they develop a presentation or hands-on demonstration of their proposed strategies. Encourage the use of visual aids, models, or even mock-ups to clearly convey their ideas.

Step 3: Sharing and Peer Feedback

- Collaborative Sharing: Have each team present or demonstrate their waste reduction strategies to the class. Facilitate a discussion after each presentation, where peers can ask questions, offer feedback, and suggest additional improvements or alternative approaches.

Step 4: Reflective Discussion

- Environmental Impact Reflection: Conclude with a group discussion on the potential environmental impact of the strategies presented. Encourage learners to think about how these ideas can be practically implemented in real-world scenarios and how they contribute to overall sustainability in agri-food production.

Photo: Retrieved from Canva, 2024

GREEN THUMB GARDEN CHALLENGE

Why

- Practical Learning: Hands-on experience with sustainable farming.
- Team Collaboration: Strengthens teamwork through shared tasks.
- Environmental Stewardship: Instills values of sustainability and biodiversity.

Instructions

1. Divide the group into teams of 5.
2. Assign each team a plot of land to prepare and plant a garden.
3. Teams plan their planting strategy using sustainable practices (e.g., crop rotation, organic fertilizers).
4. Teams prepare the soil, plant seeds, and implement water conservation techniques.
5. Teams present their gardens and sustainable practices.

Materials

- Gardening tools
- Seeds
- Compost
- Water cans
- Designated planting area

Photo: Retrieved from Canva, 2024

Timing: 2 hours

Visuals

Photos of community gardens and sustainable farming techniques.

1. Types of Urban Gardening
2. Agritecture
3. Permaculture

Obstacles

- Weather conditions may affect outdoor activities.
- Ensure all teams have equal access to tools and materials.

Evaluation Rules

- Implementation: Evaluate the adherence to sustainable practices.
- Team Cooperation: Assess teamwork during the gardening activity.
- Garden Health: Observe the health and arrangement of the garden plots.

Photo: Mahmoud ElSayed, 2024

Transferability rules

- Trainer can send the visuals to the social media groups (WhatsApp, Facebook)

Strategy for managing the classroom for Green thumb challenge

Step 1: Team Formation and Plot Assignment

- Collaborative Team Formation: Divide participants into teams of five, assigning each team a specific plot of land. Emphasize the importance of teamwork and shared responsibility in managing the plot.

Step 2: Sustainable Planning and Implementation

- Guided Sustainable Planning: Encourage teams to collaboratively plan their planting strategy, focusing on sustainable practices like crop rotation, use of organic fertilizers, and water conservation techniques.
- Hands-On Implementation: Teams prepare the soil, plant seeds, and implement their planned sustainable practices. Offer guidance and support as they work, ensuring they understand the environmental benefits of each practice.

Step 3: Garden Presentation and Reflection

- Showcase and Discuss: Have each team present their garden, explaining the sustainable practices they implemented and the reasons behind their choices. Encourage them to reflect on how their efforts contribute to environmental stewardship and biodiversity.
- Reflective Dialogue: Facilitate a group discussion where teams can share their experiences, learn from each other, and discuss how these practices can be applied to real-world farming situations.

Photo: Retrieved from Canva, 2024

BIODIVERSITY ROLE PLAY

Why

- Ecosystem Understanding: Highlights the importance of biodiversity.
- Interactive Learning: Engages participants through role-play.
- Problem-Solving: Develops skills in managing ecological balance.

Instructions

Objective: Restore and maintain ecosystem balance using biodiversity-friendly practices.

1. Assign Roles: Each participant receives a role card representing an element of the ecosystem.
2. Scenario Assignment: Divide participants into small groups and assign each group a scenario card.
3. Discussion: Within each group, participants discuss their roles and how they interact within the given scenario.
4. Problem-Solving: Develop a plan to address the scenario challenges by leveraging the strengths of each role. Consider introducing natural predators, planting diverse crops, and enhancing soil health.
5. Implementation: Role-play the scenario, with each participant acting according to their role to achieve the group's objectives.
6. Presentation: Each group presents their scenario, actions taken, and outcomes to the larger group.
7. Debrief: Discuss the effectiveness of different strategies and the importance of biodiversity in maintaining ecosystem balance.

Materials

- **Scenario cards and Role cards**
- Flip charts
- Markers

Timing: 1 hour

Visuals

Diverse agricultural ecosystems.

- Eco-System
- Eco-System

Obstacles

- Participants might not fully understand their roles.
- Provide clear explanations and examples of each role.

Evaluation Rules

- Role Understanding: Assess participants' understanding of their roles.
- Solution Effectiveness: Evaluate the proposed solutions for restoring balance.
- Team Interaction: Observe the level of collaboration and communication.

Transferability rules

- Trainer can send the visuals to the social media groups (WhatsApp, Facebook)
- Trainers should take their time in explaining the roles and the scenarios and make sure that the learners have already absorbed it all.
- Trainers should be able to give a bit of insight about ecosystem and its diversity
- Trainers should be able to explain all the importance of all agriculture elements and its environment.

Photo: Retrieved from Canva, 2024

Scenario Cards biodiversity role play

Scenario Card 1: Pollinator Decline
Background:
Your farm has experienced a significant decline in pollinator populations. This has led to poor crop yields and reduced biodiversity.

Current Conditions:
- Pollinators: Low
- Crops: Declining yields
- Pests: Moderate

Challenges:
- Increasing pollinator populations
- Improving crop yields

Objectives:
- Implement practices to attract and support pollinators.
- Balance the ecosystem to enhance biodiversity.

Scenario Card 2: Pest Outbreak
Background:
Your farm is facing an outbreak of pests that are damaging crops. Natural predators are scarce, and pest control measures need to be implemented.

Current Conditions:
- Pollinators: Moderate
- Crops: Damaged
- Pests: High

Challenges:
- Controlling pest populations without harming beneficial insects.
- Restoring crop health and productivity.

Objectives:
- Introduce natural pest predators.
- Implement IPM strategies to balance the ecosystem.

Scenario Card 3: Soil Depletion

Background:

Your farm's soil is depleted and lacks essential nutrients. This has resulted in poor plant growth and increased vulnerability to pests and diseases.

Current Conditions:

- Pollinators: Moderate
- Crops: Poor growth
- Pests: High

Challenges:

- Restoring soil health and fertility.
- Reducing pest pressure through healthier plants.

Objectives:

- Implement soil health management practices.
- Enhance biodiversity to support soil and plant health.

Scenario Card 4: Invasive Species

Background:

An invasive plant species has taken over part of your farm, outcompeting native crops and disrupting the ecosystem balance.

Current Conditions:

- Pollinators: Low
- Crops: Outcompeted by invasive species
- Pests: Moderate

Challenges:

- Controlling the invasive species.
- Restoring native crops and ecosystem balance.

Objectives:

- Develop a plan to remove or manage the invasive species.
- Reintroduce native crops and support biodiversity.

ROLE Cards

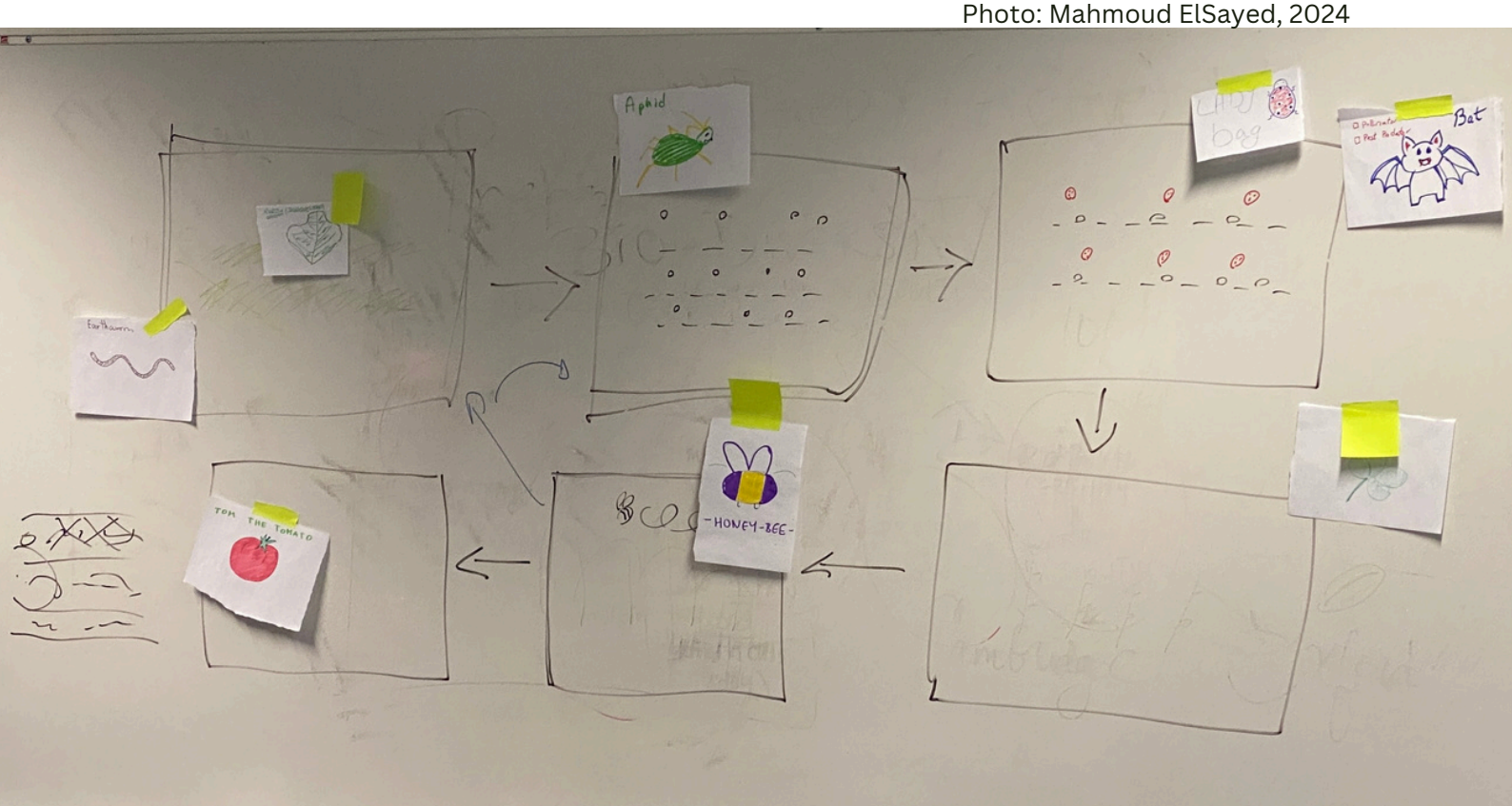
Role Card: Honeybee
Role: Pollinator
Description: As a honeybee, you play a crucial role in pollinating crops and supporting biodiversity. Your presence is vital for plant reproduction and crop yields.

Role Card: Ladybug
Role: Natural Pest Predator
Description: As a ladybug, you help control pest populations by feeding on aphids and other harmful insects. Your role is essential in maintaining pest´s natural balance

Role Card: Earthworm
Role: Soil Health Enhancer
Description: As an earthworm, you improve soil structure and fertility by breaking down organic matter and aerating the soil. Your activities are crucial for healthy plant growth.

Role Card: Crop Plant (Tomato)
Role: Primary Crop
Description: As a tomato plant, you rely on pollinators for fruit production and benefit from healthy soil and effective pest control. Your health reflects the overall ecosystem balance.

Photo: Mahmoud ElSayed, 2024



ROLE Cards

Role Card: Aphid
Role: Pest
Description: As an aphid, you feed on plant sap, potentially damaging crops. Your population needs to be controlled to prevent crop loss and maintain ecosystem health.

Role Card: Clover
Role: Cover Crop
Description: As a clover plant, you fix nitrogen in the soil, improving soil fertility. You also provide habitat for beneficial insects and help prevent soil erosion.

Role Card: Invasive Weed (Kudzu)
Role: Invasive Species
Description: As kudzu, you outcompete native plants and disrupt the ecosystem. Your presence needs to be managed to restore balance and support native biodiversity.

Role Card: Bat
Role: Nocturnal Pollinator and Pest Predator
Description: As a bat, you pollinate night-blooming plants and control nocturnal pests. Your dual role supports both plant reproduction and pest management.

Photo: Mahmoud ElSayed, 2024

Strategy for managing the classroom for Bio Diversity Role Play

Step 1: Role Assignment and Scenario Introduction

- Role and Scenario Setup: Assign each participant a role card representing an element of the ecosystem (e.g., pollinator, predator, crop). Divide the group into smaller teams, providing each with a scenario card that presents a challenge to ecosystem balance.

Step 2: Group Discussion and Problem-Solving

- Role Interaction Discussion: Within each group, participants discuss their roles and how these elements interact within the scenario. Encourage them to think about the ecological importance of each role.
- Strategic Problem-Solving: Guide teams as they develop a plan to restore and maintain balance in their ecosystem using biodiversity-friendly practices, such as introducing natural predators or planting diverse crops. Ensure they consider the ecological impacts of their decisions.

Step 3: Role-Play and Implementation

- Interactive Role-Play: Have participants role-play their scenario, with each member acting according to their assigned role. Encourage active participation and collaboration to achieve the group's ecological objectives.

Step 4: Presentation and Reflective Debrief

- Scenario Presentation: Each group presents their scenario, the actions they took, and the outcomes. They should explain how their strategies promoted biodiversity and balanced the ecosystem.
- Reflective Debrief: Conclude with a group discussion on the effectiveness of different strategies. Highlight the role of biodiversity in maintaining ecosystem health and discuss how these lessons can be applied in real-world situations.

Photo: Retrieved from Canva, 2024

RESOURCE MANAGEMENT RELAY

Why

- Efficiency: Teaches the importance of resource management.
- Teamwork: Enhances cooperative planning and execution.
- Sustainability Awareness: Promotes the understanding of sustainable resource use.

Instructions

1. Team Discussion: Discuss the current conditions and challenges of your farm based on the scenario card.
2. Strategic Planning: Develop a detailed plan to address the challenges using sustainable resource management practices.
3. Resource Allocation: Decide how to allocate resources (water, soil nutrients, energy) effectively.
4. Implementation: Outline specific actions to take each round (e.g., introducing drip irrigation, applying organic fertilizers, installing solar panels).
5. Monitoring: Use tokens or other markers to track resource levels and improvements or degradations based on your decisions.
6. Outcome Evaluation: After several rounds, evaluate the outcomes of your strategies. Discuss what worked well and what could be improved.
7. Presentation: Present your farm's progress, strategies implemented, and results to the other teams.

Materials

- **Resource management scenario cards**
- Flip charts
- Markers
- Resource tokens

Timing: 1:30 hours

Visuals

Resource management practices

Obstacles

- Teams might mismanage resources initially.
- Clarify resource management strategies thoroughly.

Evaluation Rules

- Resource Utilization: Evaluate the efficiency of resource use.
- Problem-Solving: Assess the solutions for managing resource challenges.
- Presentation Skills: Evaluate the clarity and depth of team presentations.

Transferability rules

- Trainer can send the visuals to the social media groups (WhatsApp, Facebook)
- Trainers should take their time in explaining the scenarios and make sure that the learners have already absorbed it all.

Scenario cards resource management relay

Scenario Card 1: Drought Management

Background: Your farm is experiencing a severe drought. Water resources are critically low, and you need to manage your resources efficiently to ensure the survival of your crops.

Current Conditions:

- Water Availability: Very low
- Soil Health: Good
- Energy Resources: Moderate

Challenges:

- Allocating limited water resources effectively.
- Implementing water-saving techniques.

Objectives:

- Prioritize essential crops for irrigation.
- Introduce water-efficient irrigation systems.
- Monitor and reduce water usage.

Photo: Retrieved from Canva, 2024

Scenario Card 2: Soil Fertility Restoration

Background: Your farm's soil has become infertile due to overuse and poor management practices. Crop yields have decreased significantly.

Current Conditions:

- Water Availability: Moderate
- Soil Health: Poor
- Energy Resources: Moderate

Challenges:

- Restoring soil fertility.
- Preventing further soil degradation.

Objectives:

- Implement crop rotation and cover cropping.
- Use organic fertilizers and compost.
- Enhance soil structure and nutrient content.

Scenario Card 3: Energy Efficiency

Background: Your farm's energy costs have skyrocketed, affecting profitability. There is a need to adopt more energy-efficient practices and renewable energy sources.

Current Conditions:

- **Water Availability**: High
- **Soil Health**: Good
- **Energy Resources**: Low

Challenges:

- Reducing energy consumption.
- Transitioning to renewable energy sources.

Objectives:

- Implement energy-efficient technologies (e.g., solar panels, energy-efficient equipment).
- Conduct an energy audit to identify areas of high consumption.
- Educate staff on energy-saving practices.

Scenario Card 4: Pest Management

Background: Your farm is facing an increase in pest populations, which are damaging crops and reducing yields. Chemical pesticides are not a sustainable long-term solution.

Current Conditions:

- Water Availability: Moderate
- Soil Health: Good
- Energy Resources: Moderate
- Pest Levels: High

Challenges:

- Managing pests without relying on chemical pesticides.
- Protecting crop health and yield.

Objectives:

- Implement Integrated Pest Management (IPM) strategies.
- Introduce natural predators and beneficial insects.
- Use crop rotation and diversity to disrupt pest cycles.

Scenario Card 5: Biodiversity Enhancement

Background: Your farm has low biodiversity, making it more vulnerable to pests and diseases. Increasing biodiversity is essential for creating a more resilient farming system.

Current Conditions:

- Water Availability: Moderate
- Soil Health: Good
- Energy Resources: Moderate

Challenges:

- Enhancing farm biodiversity.
- Creating a balanced ecosystem.

Objectives:

- Plant a variety of crops and cover crops.
- Create habitats for beneficial insects and wildlife.
- Use agroforestry practices to integrate trees into farming systems.

Strategy for managing the classroom for Resource Management Relay

Step 1: Team Discussion and Scenario Analysis

- Contextual Discussion: Have each team discuss the current conditions and challenges of their assigned farm based on the scenario card. Emphasize understanding the farm's specific needs and potential sustainability challenges.

Step 2: Strategic Planning and Resource Allocation

- Sustainable Planning: Guide teams in developing a detailed plan to address their challenges. Encourage them to focus on sustainable resource management practices, such as water conservation, organic fertilization, and energy efficiency.
- Resource Allocation: Teams should carefully decide how to allocate their limited resources (water, soil nutrients, energy) to maximize sustainability and productivity.

Step 3: Implementation and Monitoring

- Action Implementation: Have teams outline specific actions for each round, such as introducing drip irrigation, applying organic fertilizers, or installing solar panels. Ensure they consider the long-term sustainability of their choices.
- Resource Monitoring: Use tokens or other markers to track resource levels and observe improvements or degradations based on their decisions, fostering an understanding of cause and effect in resource management.

Step 4: Outcome Evaluation and Presentation

- Evaluative Reflection: After several rounds, facilitate an evaluation of the outcomes. Teams should discuss what strategies worked well, what challenges they faced, and what could be improved in future planning.
- Group Presentation: Each team presents their farm's progress, the strategies they implemented, and the results. Encourage them to reflect on the sustainability of their practices and the efficiency of their resource management.

SUSTAINABLE SUPPLY CHAIN CHALLENGE

Why

- Systems Thinking: Encourages understanding of the entire agri-food supply chain.
- Collaboration: Enhances teamwork through complex problem-solving.
- Sustainability Awareness: Promotes the adoption of sustainable practices across the supply chain.

Instructions

1. Divide the group into teams of 4-5 members.
2. Assign each team a section of the supply chain (e.g., production, processing, distribution, retail).
3. Provide scenario cards detailing challenges specific to each section (e.g., reducing carbon footprint in transportation, sourcing organic materials).
4. Teams develop sustainable strategies to address their specific challenges.
5. After 30 minutes, teams come together to form a complete supply chain and discuss how their strategies interconnect.
6. Each team presents their section's strategies and how they contribute to an overall sustainable supply chain.

Materials

- Scenario cards. Flip charts. Markers

Timing: 1:30 hours

Visuals

Illustrations of different stages in the agri-food supply chain and sustainable practices at each stage.

Obstacles

- Ensuring all teams understand their specific supply chain section.
- Coordinating between teams to create a cohesive supply chain strategy.

Evaluation Rules

- Integration Quality: Assess how well each section's strategies integrate to form a sustainable supply chain.
- Team Collaboration: Observe intra-team and inter-team collaboration.
- Strategic Effectiveness: Evaluate the sustainability and feasibility

Sustainable Supply Chain Challenge - Scenario cards

Scenario Card 1: Sustainable Production Practices

Section: Production

Situation: Your farm is facing criticism for its high water usage and reliance on chemical fertilizers. The soil health is deteriorating, and biodiversity is low.

Challenges:

1. Reduce water usage while maintaining crop yields.
2. Transition from chemical to organic farming methods.
3. Increase crop diversity to improve soil health and biodiversity.

Objectives:

- Implement efficient irrigation systems (e.g., drip irrigation).
- Introduce organic fertilizers and composting practices.
- Plan and execute crop rotation and polyculture strategies.

Scenario Card 2: Energy-Efficient Processing

Section: Processing

Situation: Your processing facility consumes large amounts of energy, resulting in high costs and carbon emissions. Additionally, waste management is inefficient.

Challenges:

1. Reduce energy consumption in the processing plant.
2. Improve waste management and recycling practices.
3. Transition to renewable energy sources.

Objectives:

- Upgrade to energy-efficient machinery and lighting.
- Implement a comprehensive waste reduction and recycling program.
- Install solar panels or wind turbines to offset energy usage.

Scenario Card 3: Low-Emission Distribution

Section: Distribution

Situation: Your distribution network has a significant carbon footprint due to inefficient logistics and transportation practices. Perishable goods often spoil, leading to waste.

Challenges:
1. Reduce carbon emissions from transportation.
2. Optimize logistics to improve efficiency.
3. Minimize waste of perishable goods.

Objectives:
- Transition to electric or hybrid delivery vehicles.
- Use route optimization software to reduce travel time and fuel usage.
- Implement cold chain logistics to preserve perishable items.

Scenario Card 4: Eco-Friendly Retail Operations

Section: Retail

Situation: Your retail stores have high energy usage and generate a lot of packaging waste. Consumers are becoming increasingly aware of sustainability issues.

Challenges:
1. Reduce energy consumption in retail stores.
2. Minimize packaging waste.
3. Increase consumer awareness of sustainable practices.

Objectives:
- Install energy-efficient lighting and HVAC systems.
- Introduce bulk bins and encourage reusable packaging.
- Educate consumers through in-store displays and marketing campaigns.

Strategy for managing the classroom for Sustainble supply chain challenge

Step 1: Team Formation and Scenario Assignment

- Role-Based Team Formation: Divide participants into teams of 4-5 members, with each team assigned a specific section of the supply chain (e.g., production, processing, distribution, retail). Provide scenario cards outlining sustainability challenges specific to each section.

Step 2: Strategy Development

- Focused Problem-Solving: Guide each team to develop sustainable strategies to address their assigned challenges. Encourage them to consider innovative approaches that reduce environmental impact, such as sourcing organic materials, reducing carbon footprints in transportation, or minimizing waste in processing.

Step 3: Supply Chain Integration

- Collaborative Discussion: After 30 minutes, bring all teams together to form a complete supply chain. Facilitate a discussion on how each team's strategies interconnect and support the overall sustainability of the entire supply chain. Emphasize the importance of systems thinking in ensuring that actions in one part of the chain do not negatively impact others.

Step 4: Presentation and Reflection

- Holistic Presentation: Have each team present their section's strategies, explaining how they contribute to an overall sustainable supply chain. Encourage them to highlight the interdependencies between different sections and the importance of collaboration in achieving sustainability goals.
- Reflective Dialogue: Conclude with a group reflection on the experience, discussing how systems thinking can be applied to real-world supply chains and the importance of collaborative efforts in driving sustainability across the agri-food industry.

ECO-INNOVATION HACKATHON

Why

- Innovation: Fosters creative problem-solving and innovation in sustainable agriculture.
- Team Building: Enhances teamwork through collaborative brainstorming and project development.
- Practical Application: Develops actionable ideas for real-world sustainability challenges.

Instructions

1. Divide the group into teams of 4-5 members.
2. Provide each team with a challenge card describing a specific sustainability issue in agri-food production.
3. Teams brainstorm and develop an innovative solution to their assigned challenge.
4. Teams create a prototype, model, or detailed plan of their solution.
5. Each team presents their solution to the group, explaining its sustainability benefits and feasibility.

Materials

- Challenge cards
- Flip charts
- Markers
- Craft materials for prototypes (e.g., cardboard, glue, scissors)

Photo: Mahmoud ElSayed, 2024

Visuals

Photos or illustrations of innovative agricultural technologies and sustainable practices.

Obstacles

- Ensuring all teams understand their assigned challenge.
- Providing sufficient materials for prototype creation.

Evaluation Rules

- Innovation: Evaluate the creativity and originality of the solutions.
- Feasibility: Assess the practicality and implementability of the solutions.
- Team Collaboration: Observe teamwork and communication during the brainstorming and development process.

Transferability rules

- The trainer can send the visuals to the social media groups (WhatsApp, Facebook)
- The trainer should take their time in explaining the challenges and make sure that the learners have already absorbed it all.
- The trainer should be able to clarify what hackathons and how it is applied in many sectors and some basic knowledge pros and cons related to the concept and usage.

Challenge Cards for Eco-Innovation Hackathon

Challenge 1: Water Conservation Technology

Problem: High water usage and inefficient irrigation practices.
Objective: Develop a technology or method to conserve water in agriculture.

Challenge 2: Renewable Energy Integration

Problem: High reliance on non-renewable energy sources.
Objective: Create a plan to integrate renewable energy into farm operations.

C**hallenge 3: Waste Reduction**

Problem: Excess waste generation from agricultural activities.
Objective: Design a system to reduce, reuse, or recycle agricultural waste.

Challenge 4: Soil Health Improvement
Problem: Soil degradation and nutrient depletion.
Objective: Develop a method to improve soil health and fertility sustainably.

Challenge 5: Biodiversity Enhancement
Problem: Low biodiversity leading to ecosystem vulnerability.
Objective: Create a strategy to increase biodiversity on the farm.

Strategy for managing the classroom for Eco Innovation Hackathon

Step 1: Team Formation and Challenge Assignment

- Challenge-Based Team Formation: Divide participants into teams of 4-5 members. Provide each team with a challenge card that outlines a specific sustainability issue in agri-food production (e.g., reducing water usage in farming, developing eco-friendly packaging).

Step 2: Brainstorming and Solution Development

- Creative Problem-Solving: Encourage teams to brainstorm innovative solutions to their assigned challenge. Foster an environment where all ideas are welcomed, and creativity is encouraged. Guide them to consider both the sustainability and feasibility of their proposed solutions.

Photo: Mahmoud ElSayed, 2024

Step 3: Prototype or Plan Creation

- Practical Implementation: Have teams create a prototype, model, or detailed plan of their solution. This could be a physical model, a digital mock-up, or a comprehensive action plan. Ensure they focus on how their solution addresses the sustainability challenge and its potential impact in the real world.

Step 4: Presentation and Group Discussion

- Solution Presentation: Each team presents their solution to the group, explaining the sustainability benefits and practical feasibility. Encourage them to highlight the innovative aspects of their approach and how it could be implemented in real-world scenarios.
- Group Reflection: Facilitate a group discussion where participants can provide feedback, ask questions, and suggest improvements. Emphasize the importance of innovation in driving sustainable practices in agri-food production.

Photo: Mahmoud ElSayed, 2024