GREEN PARTICIPATION, GREEN EUROPE

GREEN PRACTICES IN AGRICULTURE AGAINST CLIMATE CHANGE

HANDBOOK

PROJECT NUMBER : 2023-2-TR01-KA154-YOU-000168735

PURPOSE

A12 will explore the essential role agriculture plays in supporting both our environment and the economy.

Sustainable agriculture is vital for ensuring food security, strengthening economic resilience, and fostering social equity.

Participants will examine how implementing sustainable practices can help mitigate climate change by lowering carbon emissions, conserving natural resources, and ensuring fair labor conditions.

OBJECTIVES

Raising Awarenes

Promote Sustainable Practices

Empower Youth

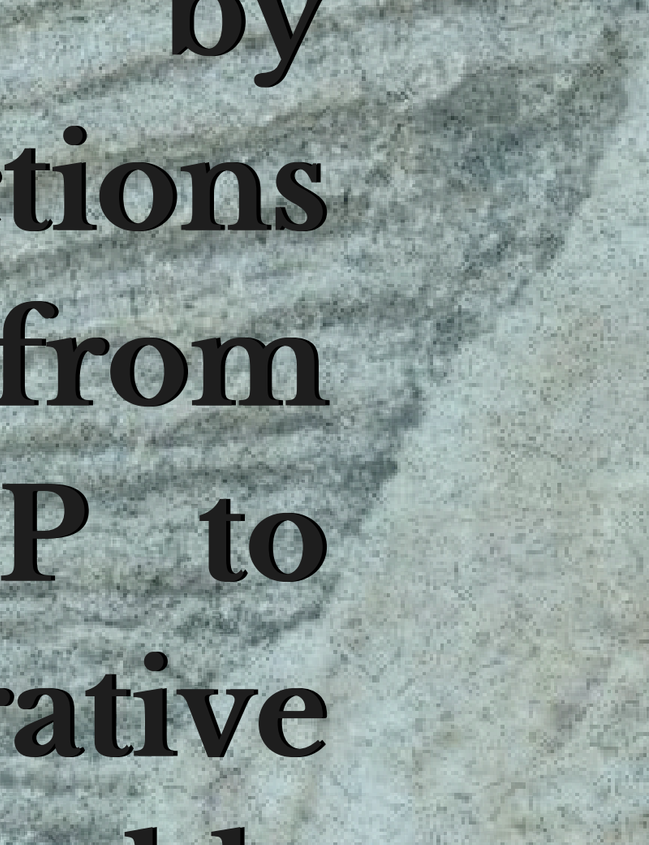
Foster Collaboration

Raising awareness by educating participants on the importance of sustainable agricultural practices and their role in combating climate change.

Promote sustainable practices by encouraging the adoption of methods that preserve natural resources, foster biodiversity, and minimize environmental impact.

Empower youth by equipping participants with the knowledge and skills to advocate for and implement sustainable agricultural practices in their communities.

Foster collaboration by building connections between participants from IU, TTB, and MCOOP to encourage a cooperative approach to sustainable agriculture.



Overuse Chemicals

Deplete Soil

Waste Water

DO NOT

Monocrop

Burn Biomass

Waste Machinery

Overuse Machi

Instead

Prioritize Natural Pest Control

Regenerate the Soil

Conserve Every Drop

Diversify Crops

Compost Biomass Waste

Opt for Renewable Energy

EFFECTS OF CLIMATE CHANGE ON AGRICULTURE

CLIMATE CHANGE HEAVILY IMPACTS AGRICULTURE, DISRUPTING CROP YIELDS, SOIL QUALITY, AND WATER RESOURCES. RISING TEMPERATURES, EXTREME WEATHER, AND FREQUENT DROUGHTS OR FLOODS SHORTEN GROWING SEASONS AND INCREASE SOIL EROSION AND PEST ISSUES, PUTTING FOOD SECURITY AT RISK. GREEN AGRICULTURAL PRACTICES LIKE WATER CONSERVATION, SOIL REGENERATION, AND CROP DIVERSIFICATION BUILD RESILIENCE AGAINST THESE CLIMATE IMPACTS. BY ADOPTING SUSTAINABLE METHODS, AGRICULTURE CAN BETTER ADAPT TO THESE CHANGES, PROTECT NATURAL RESOURCES, AND CONTRIBUTE TO EMISSIONS REDUCTION, ALIGNING WITH CLIMATE RESILIENCE GOALS AND A MORE SUSTAINABLE FOOD SYSTEM.

Sustainibility in Agriculture

MEANS THAT

While farming Choosing What's Best for NATURE Using Natural Sources not to **DESTROY** but to **AID** it

SUSTAINABLE AGRICULTURE PRACTICES

ROTATING CROPS AND EMBRACING DIVERSITY

GROWING A VARIETY OF CROPS IN ROTATION IMPROVES SOIL FERTILITY, DISRUPTS PEST CYCLES, AND INCREASES RESILIENCE TO CLIMATE FLUCTUATIONS.

THESE CROPS PROTECT THE SOIL FROM EROSION, IMPROVE WATER RETENTION, AND ADD ORGANIC MATTER, FOSTERING LONG-TERM PRODUCTIVITY.

PLANTING COVER CROPS AND PRENNIALS

REDUCING OR ELIMINATING TILLAGE

MINIMIZING TILLAGE PRESERVES SOIL INTEGRITY, REDUCES EROSION, AND CUTS CARBON EMISSIONS BY MAINTAINING ORGANIC MATTER IN THE SOIL.



IPM USES A COMBINATION OF NATURAL, CULTURAL, AND MECHANICAL TECHNIQUES TO CONTROL PESTS, REDUCING THE NEED FOR CHEMICAL PESTICIDES AND PROTECTING THE ENVIRONMENT.

APPLYING INTEGRATED PEST MANAGEMENT (IPM)

INTEGRATING LIVESTOCK AND CROPS

COMBINING LIVESTOCK WITH CROP FARMING CREATES A SUSTAINABLE CYCLE WHERE ANIMAL WASTE ENRICHES THE SOIL AND REDUCES ENVIRONMENTAL IMPACT.

ADOPTING AGROFORESTRY PRACTICES

INCORPORATING TREES AND SHRUBS INTO FARMLAND BOOSTS BIODIVERSITY, ENHANCES SOIL QUALITY, AND CAPTURES CARBON, CONTRIBUTING TO CLIMATE RESILIENCE.

MANAGING WHOLE SYSTEMS AND LANDSCAPES

A HOLISTIC APPROACH CONSIDERS THE ENTIRE AGRICULTURAL ECOSYSTEM, PROMOTING PRACTICES THAT BALANCE SOIL HEALTH, WATER RESOURCES, AND BIODIVERSITY.

WHY THE SHIFT FROM CONVENTIONAL TO SUSTAINABLE FARMING?

Sustainable agriculture practices offer a myriad of benefits:

- **Preserving soil health**
- **Promoting biodiversity**
- **Securing future food supply**
- **Supporting farmer livelihoods**
- **Combatting climate change**



https://regenx.ag/blog/sustainable-agriculture-practices/

EROSIONS

EROSIONS ARE CRITICAL ISSUES BECAUSE;
THEY DEGRADE SOIL HEALTH,
REDUCE AGRICULTURAL PRODUCTIVITY,
DISRUPT ECOSYSTEMS.

SOIL EROSIONS ARE OFTEN CAUSED BY;

- UNSUSTAINABLE FARMING PRACTICES LIKE OVER-TILLING,
- DEFORESTATION,
- LACK OF GROUND COVER,

CAN LEAD TO NUTRIENT LOSS, WEAKEN THE LAND'S RESILIENCE TO CLIMATE IMPACTS LIKE DROUGHTS AND FLOODS.

FIGHTING AGAINST EROSIONS INVOLVES PRACTICES SUCH AS;

- PLANTING COVER CROPS,
- REDUCING TILLAGE,
- BUILDING SOIL STRUCTURES LIKE TERRACES TO RETAIN SOIL.

ADDRESSING EROSION IS ESSENTIAL FOR BUILDING CLIMATE-RESILIENT AGRICULTURE, PRESERVING BIODIVERSITY AND SUPPORTING LONG-TERM FOOD SECURITY.

BUILDING A CLIMATE RESILIENT AGRICULTURE SYSTEM

BUILDING A CLIMATE-RESILIENT AGRICULTURE SYSTEM IS VITAL TO WITHSTAND THE IMPACTS OF CLIMATE CHANGE, SUCH AS DROUGHTS, FLOODS, AND HEATWAVES. RESILIENT PRACTICES LIKE;

- CONSERVING WATER,
- REGENERATING SOIL,
- BOOSTING BİODIVERSITY,
- HELP FARMS ADAPT,
- SECURING FOOD SUPPLIES AND
- PROTECTING LİVELİHOODS.

THIS APPROACH SUPPORTS A SUSTAINABLE FOOD SYSTEM FOR FUTURE GENERATIONS.

Climate Neutral Agriculture by 2050

THE EU GREEN DEAL'S GOAL OF "CLIMATE NEUTRAL AGRICULTURE BY 2050" AIMS FOR FARMING TO BALANCE ITS EMISSIONS BY CAPTURING OR OFFSETTING AS MUCH CARBON AS IT RELEASES.

ACHIEVING THIS REQUIRES SUSTAINABLE PRACTICES LIKE ORGANIC FARMING, PRECISION AGRICULTURE, AND RENEWABLE ENERGY USE, WITH SUPPORT FOR FARMERS TO IMPLEMENT THESE CHANGES.

THIS GOAL ALIGNS WITH THE EU'S COMMITMENT TO A CLIMATE-NEUTRAL ECONOMY, ENSURING AGRICULTURE SUPPORTS CLIMATE STABILITY.

Biodiversity and Ecosystem Preservation

SEEKING TO PROTECT NATURAL HABITATS, CONSERVE WILDLIFE, AND REDUCE POLLUTION.

ACTIONS INCLUDE SAFEGUARDING ENDANGERED SPECIES, RESTORING DEGRADED LANDS, AND CUTTING CHEMICAL USE IN FARMING.

THIS GOAL SUPPORTS RESILIENT ECOSYSTEMS THAT CAN ADAPT TO CLIMATE CHANGE, ENSURING LONG-TERM ENVIRONMENTAL AND ECONOMIC HEALTH.

Farm to Fork Strategy

FARM TO FORK STRATEGY" AIMS TO BUILD A SUSTAINABLE FOOD SYSTEM THAT SUPPORTS BOTH HEALTH AND THE ENVIRONMENT.

IT SEEKS TO REDUCE THE ENVIRONMENTAL IMPACT OF FOOD PRODUCTION BY LIMITING PESTICIDE AND FERTILIZER USE, PROMOTING ORGANIC FARMING, IMPROVING ANIMAL WELFARE, AND REDUCING FOOD WASTE.

THE STRATEGY ALSO ENCOURAGES HEALTHIER DIETS AND FAIRER CONDITIONS FOR FARMERS AND CONSUMERS, SUPPORTING CLIMATE GOALS, BIODIVERSITY, AND FOOD SECURITY ACROSS THE EU.

CIRCULAR ECONOMY IN AGRICULTURE

CIRCULAR ECONOMY IN AGRICULTURE AIMS TO MINIMIZE WASTE AND OPTIMIZE RESOURCES IN FARMING.

THIS INCLUDES REUSING MATERIALS, RECYCLING AGRICULTURAL BY-PRODUCTS AS COMPOST, REDUCING RELIANCE ON SYNTHETIC INPUTS, AND PROMOTING SUSTAINABLE PRODUCT DESIGN.

BY CREATING A SELF-SUSTAINING SYSTEM, THIS GOAL REDUCES ENVIRONMENTAL IMPACT, LOWERS COSTS, AND STRENGTHENS AGRICULTURE'S RESILIENCE, ALIGNING WITH CLIMATE AND ENVIRONMENTAL TARGETS.

GOAL 12

RESPONSIBLE CONSUMPTION AND PRODUCTION

THIS GOAL FROM THE 17 GOALS OF GLOBAL GOALS PROMOTES;

- EFFICIENT RESOURCE USE,
- WASTE REDUCTION
- SUSTAINABLE PRACTICES.

IT AIMS TO;

- CUT POLLUTION,
- MINIMIZE FOOD WASTE,
- ENCOURAGE RECYCLING TO PROTECT THE PLANET'S RESOURCES
- IMPROVE GLOBAL QUALITY OF LIFE.

THE GLOBAL GOALS

GOAL 15

LIFE ON LAND

THIS GOAL FROM THE 17 GOALS OF GLOBAL GOALS AIMS TO;

- PROTECT,
- RESTORE,
- PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS.

IT FOCUSES ON;

- HALTING DEFORESTATION,
- COMBATING DESERTIFICATION,
- PRESERVING BIODİVERSITY,
- PREVENTİNG LAND DEGRADATION

TO ENSURE HEALTHY ECOSYSTEMS AND SUPPORT LIFE ON EARTH.

IMPROVING SOIL HEALTH

COMPOST AND MULCH

Compost is mixed into the soil before planting to enrich it with organic matter and nutrients, while mulch is placed around established plants to help conserve moisture by reducing evaporation, suppress weeds, and moderate soil temperature. Since both compost and mulch can be produced directly on the farm, they provide farmers with a cost-effective way to improve soil quality and sustainability.

ORGANIC FARMING

Organic farming uses techniques that prioritize natural inputs to enhance soil health, minimize synthetic chemical use, and conserve water. Practices like crop rotation diversify the crops grown over time, which helps maintain soil nutrients, reduces pest buildup, and improves the soil's water retention capacity.





MINIMIZING AIR POLLUTION

AIR POLLUTION HARMS AGRICULTURE BY REDUCING CROP YIELDS, DEGRADING SOIL QUALITY, AND DAMAGING PLANT HEALTH. POLLUTANTS LIKE OZONE CAN WEAKEN CROPS, WHILE ACID RAIN STRIPS SOIL OF ESSENTIAL NUTRIENTS. TO COUNTER THESE EFFECTS, SUSTAINABLE PRACTICES SUCH AS REDUCED CHEMICAL INPUTS, PRECISION FARMING, ORGANIC METHODS, AND AGROFORESTRY CAN PROTECT CROP RESILIENCE AND SOIL HEALTH. THESE PRACTICES NOT ONLY IMPROVE PRODUCTIVITY BUT ALSO HELP CREATE A CLEANER, MORE SUSTAINABLE FARMING ENVIRONMENT.

MINIMIZING WATER POLLUTION

WATER POLLUTION AFFECTS AGRICULTURE BY CONTAMINATING SOIL AND HARMING CROP GROWTH, OFTEN DUE TO RUNOFF FROM PESTICIDES, FERTILIZERS, AND ANIMAL WASTE. POLLUTED WATER CAN DEGRADE SOIL HEALTH, REDUCE YIELDS, AND THREATEN SURROUNDING ECOSYSTEMS. TO COMBAT THIS, SUSTAINABLE PRACTICES LIKE USING FEWER CHEMICALS, IMPLEMENTING BUFFER ZONES AROUND WATER BODIES, AND ADOPTING ORGANIC FARMING CAN HELP REDUCE RUNOFF. THESE METHODS PROTECT WATER QUALITY, SUPPORT HEALTHIER SOILS, AND PROMOTE A MORE RESILIENT AGRİCULTURAL ENVIRONMENT.

GREEN APPLICATION PRACTICES

REDUCING CHEMICAL USE

Limiting pesticides and synthetic fertilizers through organic and integrated pest management practices helps safeguard soil and water health.

SOIL HEALTH AND EROSION CONTROL

Using techniques like cover cropping, minimal tillage, and crop rotation strengthens soil structure, prevents erosion, and enhances nutrient availability.

AGROFORESTRY

Integrating trees and shrubs within agricultural landscapes supports biodiversity, improves air quality, and enhances carbon storage.

PRECISION AGRICULTURE

Employing technology to deliver water, nutrients, and treatments only where necessary reduces waste and minimizes environmental impact.

EFFICIENT WATER MANAGEMENT

Methods like drip irrigation and rainwater collection ensure optimal water usage and help prevent runoff.

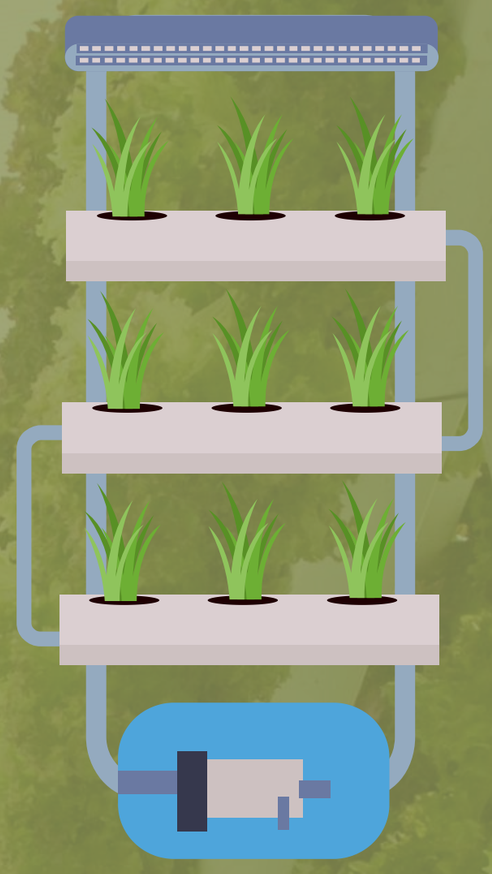
BIODIVERSITY ENHANCEMENT

Planting a variety of crops and creating pollinator habitats strengthen ecosystem health and resilience.

HYDROPONIC FARMING



What is it?



Hydroponics is a way to skip the soil, sub in a different material to support the roots of the plant, and grow crops directly in nutrient-rich water.

What you need:

- Fresh water: Most plants like water with a pH level around 6–6.5.
- Oxygen
- Root support: vermiculite, perlite, peat moss, coconut fiber, and rockwool
- Nutrients: magnesium, phosphorus, calcium, and other nutrients
- Light

Why grow without soil?

It allows growers to produce food anywhere in the world, at any time of the year, and to net higher yields with fewer resources.

https://www.verticalroots.com/the-what-and-why-of-hydroponic-farming/

Sustainability in Hydroponics

In hydroponics, sustainability is a core principle. By reducing land and soil degradation, hydroponics preserves natural resources. The minimized use of pesticides and herbicides ensures environmentally friendly farming practices. Hydroponics also has a lower carbon footprint compared to traditional farming, contributing to a greener future.

ADVANTAGES

- Reduced land and soil degradation
- Minimized use of pesticides and herbicides
- Lower carbon footprint compared to traditional farming
- Reduced water pollution and waste
- Increased crop yield and growth rate

https://forestnation.com/blog/hydroponics-amp-sustainability-everything-you-need-to-know/?srsltid=AfmBOoow73SgcI_D7fywitNnTvbw_GmdUnGoXFfiWUF704TGPjinAgyg

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