A Challenge to go GREEN!

SSYS Info-Session
12 June 2025

SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEAMEO SEARCA)

Why Go Green?

Climate change fueled deadly Typhoon Carina — study

A bus stalls in the middle of E. Rodriguez Avenue while rescue personnel from the QCDRRMO and Barangay Damayan Lagi in Quezon City ferry stranded commuters and residents across the heavy flood caused by torrential rains brought by Typhoon Carina and the southwest monsoon on July 24, 2024.

Evacuation continues following Indonesia's Ruang volcano eruption

By **Reuters**

May 1, 2024 11:51 PM GMT+8 · Updated a year ago

[1/5] People board KRI Kakap-881 warship in the port of Tagulandang, to be evacuated to North Minahasa Regency on Sulawesi island, following the eruptions of Mount Ruang volcano in Sitaro, North Sulawesi province, Indonesia. Antara Foto/Andri Saputra Purchase Licensing Rights

Rescue efforts from Myanmar's deadly earthquake wind down as death toll hits 3,600

People clean debris from damaged buildings in the aftermath of an earthquake on March 28, in Naypyitaw, Myanmar.

Human-induced Hazards

Examples:

Deforestation

Oil Spills

Global Warming

Nuclear Accident

Hazardous Waste

Whether caused by natural hazards or human-induced,

“Ang kabataan
ang pag-asa ng bayan.”

The Challenge to go GREEN!

- Rethink education to better care for our planet.
- Apply STEM in new and connected ways to solve environmental challenges
- Empower the youth to lead innovation for sustainability.

What Is Green Education?

- Part of the broader concept of Education for Sustainable Development (ESD)
- Focuses on environmental awareness, ecological literacy and **action** to protect and restore nature
- Goes **beyond** teaching about the environment; not just about planting trees or cleaning rivers
- Understanding how **everything is connected**

The Role of Green Education in achieving the SDGs

ELSEVIER

Renewable and Sustainable Energy Reviews

Volume 210, March 2025, 115239

The role of green education in achieving the sustainable development goals: A review

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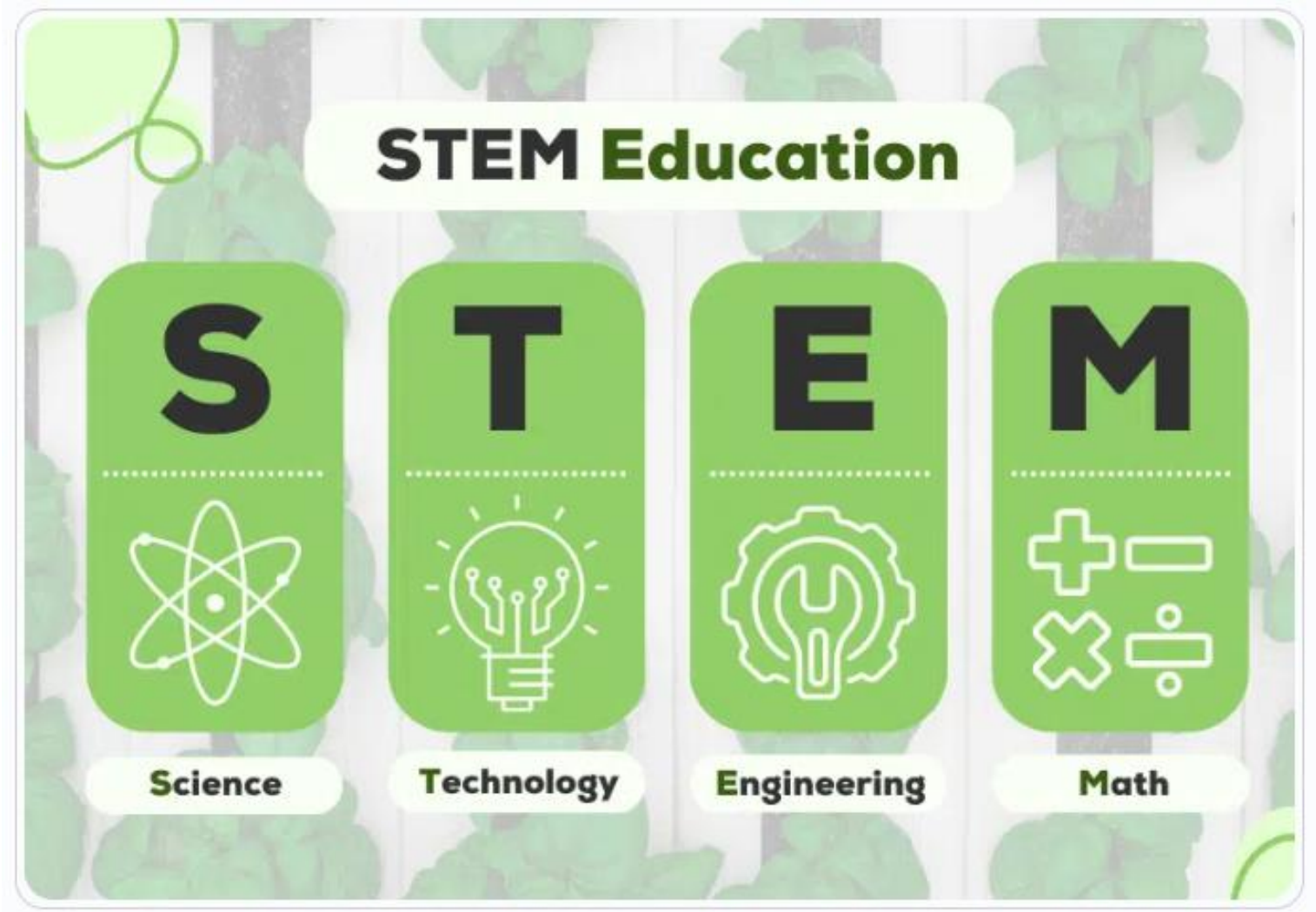
The Role of Green Education in achieving the SDGs

- In relation to sustainable development, *green education can be defined as an avenue through which human beings develop the pre-requisite skills, values, knowledge* ***and experience*** *needed to participate in* ***decision making****, both individually and collectively, at the local and global level,* ***to improve their current quality of life without compromising the future of the planet***.
- 5 major pedagogical elements: critical reflection, systemic thinking and analysis, participatory learning, creative thinking, and collaborative learning.

Why STEM and Why Interdisciplinary?



St. Michael Univ School, BC, Canada

https://zipgrow.com/hydropnics-a-stem-tool-for-holistic-classroom-education/

Agriculture

- Greenhouse management
- Pest management
- Plant disease/health
- Urban Agriculture

Family and Consumer Sciences

- Cooking
- Nutrition and healthy eating

Math

- Calculating yields, water needs, and similar problems
- Making change
- Charting
- Graphing

Biology (more related to Aquaponics)

- Aquatic ecosystems
- Diseases and viruses
- Fish biology and lifecycles
- Germination
- Microbiology (including bacteria, fungi, and algae)
- Nitrification
- Plant growth (Break apart root and foliage growth!)
- Plant lifecycles
- Symbiotic relationships

Chemistry

- Light properties and manipulation
- Oxidation-reduction reactions
- pH
- Plant nutrients

Other Science

- Botany
- Ecology
- Environmental science
- Experimental design
- Scientific process

History

- Agricultural development
- Industrial development

Other

- Automation
- Construction and design (including plumbing, heatin electrical, rack building,
- greenhouse building, etc.)
- Calculating heat needs and values
- Landscape design
- Problem solving/critical thinking/troubleshooting
- Sustainability and circular economies

Business

- Administration/management/planning
- Business planning
- Finance
- Marketing

Example for Grade 10 students in Vietnam

STEM Education: Organizing high School Students in Vietnam using Engineering Design Process to Fabricate Water Purification Systems

Dang Thi Oanh, Le Van Dung, Mai The Hung Anh, Nguyen Thi Thuy Trang

American Journal of Educational Research. **2018**, 6(9), 1289-1300. DOI: 10.12691/education-6-9-8
Received August 05, 2018; Revised September 16, 2018; Accepted September 20, 2018

- 36 Grade 10 students from Hai Ba Trung High School, Thuan Hoa High School, Thua Thien Hue Province
- applied the engineering design process to design and build filter systems to meet the need for clean water for the local people at as low a cost as possible.

The Design Loop

1. Ask: What is the problem? What are you trying to fix or make better (improve)?
2. Work in groups to brainstorm ideas. Use a variety of resources: computer, library. Ask others questions, etc.
3. Choose what you think is the best solution for the problem. Draw a sketch or blueprint of the solution and think about these questions:
   A. What will you need to build or create your solution?
   B. How will you build it?
   C. What problems or difficulties might you have?

The Design Loop

4. Test your solution or prototype.
5. Review your solution. Think about the results of the test.
   A. Was it the best solution?
   B. What could you do differently?
   C. Can you add something or change something to make it better?
6. Present the problem and your solution in class.

sand

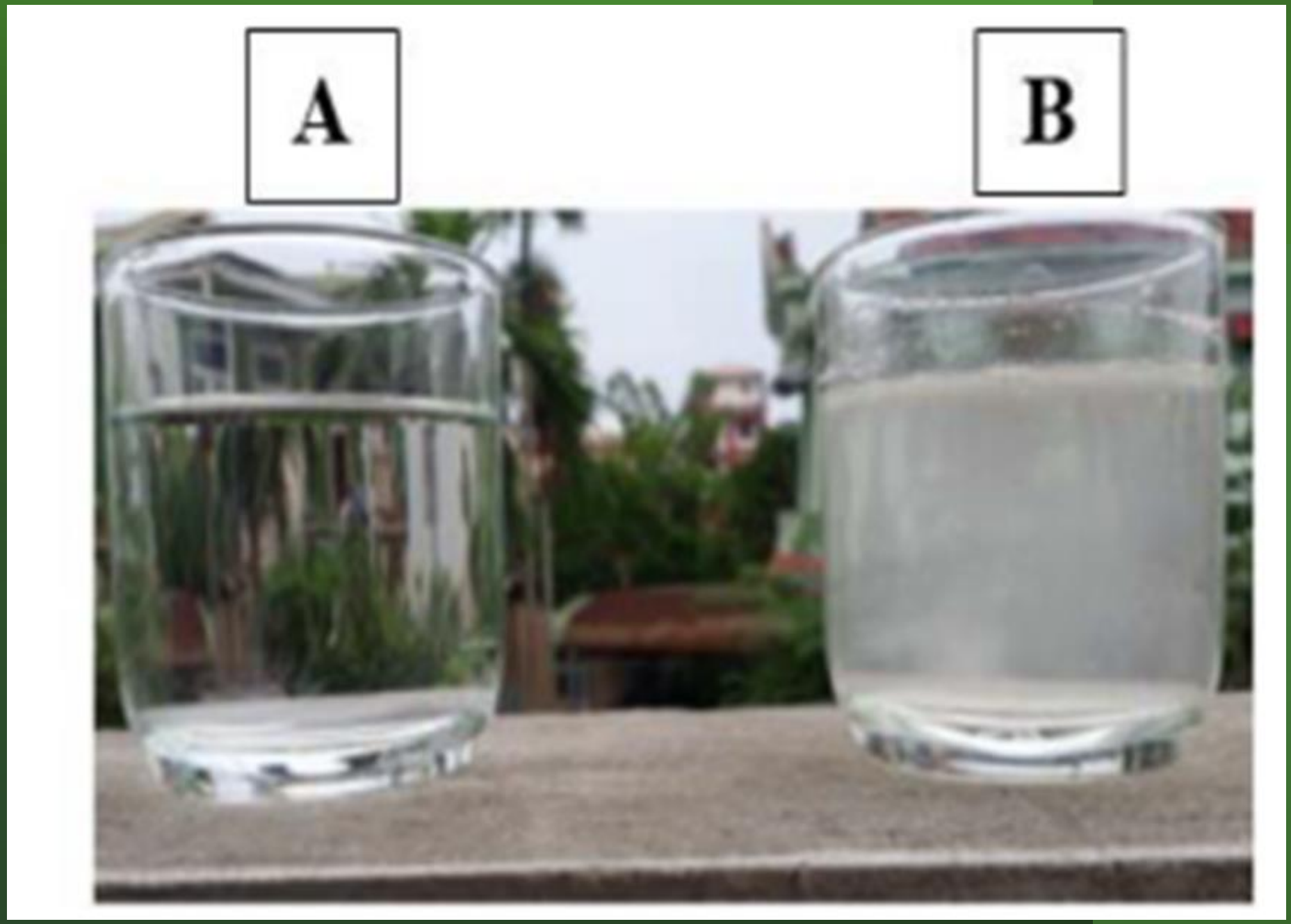
gravel

Filter paper

Dirty water

plastic bottle

Activated carbon


A
B

More of Interdisciplinary STEM

- Renewable energy projects such as the design and installation of solar panels integrate concepts of physics (energy systems), engineering (solar panel design), computer science (smart grids), and economics (cost-benefit analysis).
- Tackling plastic pollution might involve biology (decomposition rates), chemistry (material composition), data science (tracking waste flows), and public policy (regulatory design).
- School gardens and composting
- Programs that track air or water quality

More of Interdisciplinary STEM

- We need more **project-based learning**, **student-led initiatives**, and **community involvement**.
- These experiences don't just teach content—they build leadership, teamwork, and confidence. Students learn how to turn ideas into real-world impact.
- For educators and parents: when we support students in these efforts, we send a message that **their ideas matter** and their actions count.
- Rather than youth being passive recipients of information inside our classrooms, we could empower them as **co-creators of solutions**.

More of Interdisciplinary STEM

- **Schools** can start small: include sustainability projects in science fairs, encourage eco-clubs, join hackathons, or link subjects around common environmental themes.
- **Teachers** can connect lessons across subjects—for example, linking climate change in science with local farming in social studies.
- **Governments and NGOs** can support training for educators, provide green technology kits, or fund student-led environmental innovation.
- **Parents** can help by encouraging curiosity, supporting eco-friendly habits at home, and listening to students' ideas.

Mainstreaming Green Education

- Curricular Reforms
- Teacher Trainings
- Partnerships and Ecosystems
- Policy and Funding

SEARCA Initiatives on Green Education

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Responding to Climate Risks in Agriculture and Natural Resource Management

A Non-Formal Online Course

16 July-4 November 2017

SEAMEO SEARCA

Background and Rationale

As part of its effort to improve the capacity of Southeast Asian institutions working towards agricultural and rural development to respond to climate change, SEARCA launched various learning events geared to build the capacity of key actors in Southeast Asia. SEARCA's experience in conducting these offerings pointed out that (1) a vast number and variety of topics may be covered in discussing climate change adaptation and mitigation in the context of agriculture and environment; and (2) intended participants who would be involved in adaptation and mitigation activities have varied characteristics and interests.

In response to these challenges, the Non-Formal Online Course on Responding to Climate Risks in Agriculture and Natural Resource Management was developed. The online course serves as an introductory e-Learning service that provides an appreciation of the core concepts and available knowledge-based methods and tools to effectively respond to the threats of climate change on agriculture and natural resource management.

SEARCA had offered the course thrice and now offers it through the UP Open University hoping for a wider reach to learners who may benefit from the course. Under this collaboration, SEARCA and UPOU have offered the course twice.

Modules

The course covers five main modules:

Module 1: *Climate Change Adaptation as a Framework for Risk Reduction in a Changing Climate*
Objective: At the end of the module, the learners should be able to identify key strategies/ approaches in mainstreaming climate change adaptation in their respective areas of concern.

"provides an appreciation of the core concepts and available knowledge-based methods and tools to effectively respond to the threats of climate change on agriculture and natural resource management"

Module 2: *Southeast Asia Climate Change Scenario*
Objective: At the end of the module, the learners should be able to explain the basic process in developing climate change scenarios as well as why ensemble models are needed in projecting future climate.

Module 3: *Vulnerability Assessment: An Introduction*
Objective: At the end of the module, the learners should be able to identify the vulnerable sites and groups in a community.

Module 4: *Economic Valuation of Climate Risks in Agriculture and Natural Resource Management*
Objective: At the end of the module, the participants should be able to identify the appropriate economic valuation tool/s that can be used to estimate the value of climate change impacts as well as the costs and benefits of adaptation and mitigation strategies.

Module 5: *Managing Risks in Agriculture and Natural Resource Management due to Climate Variability*
Objective: At the end of the module, the participants should be able to explain the conditions required to effectively manage climate risk as well as the application of climate information in managing such risks in the agriculture and natural resources sector.

Non-formal Online Courses delivered by UPOU

Online course
on **integrating climate change adaptation and disaster risk management in policies, plans and investments** toward ISARD

5 September-14 November 2015
UP Open University

Background and Rationale

Advancing inclusive and sustainable agricultural and rural development (ISARD) necessitates improving the resilience of rural communities. This involves making sure that agriculture and other natural resources are conserved and sustainably managed while reducing the risks of natural disasters. Livelihoods and habitation in agricultural and natural resource ecosystems are among the most vulnerable to climate change. The aftermath of extreme weather events due to changing climate has wrought much disaster and grave threats to the sustainability of efforts toward rural poverty reduction and food security.

Adaptation has been recognized as one of the key strategies to reduce the adverse impacts of climate change. The challenge is to come up with various adaptation strategies to strengthen the coping capacity of communities and the adaptive capacity of natural ecosystems. However, climate-induced disasters have become even more frequent, drawing decision-makers' attention towards disaster risk management (DRM) in addressing the challenges wrought by changing climate.

Course Description

This ten-week course is designed as a foundational introduction into the functional elements of inclusive and sustainable agricultural and rural development (ISARD) as reframed through the interaction of policies, strategies, and projects involving climate change adaptation (CCA) and disaster risk management (DRM). The course provides an update on the discourse of CCA and DRM and further introduces specific CCA and DRM methodologies and tools for practical applications.

Objectives

At the end of the course, the online learner should be able to:

a) Review the evolving frameworks, approaches, and initiatives in CCA, mainstreaming CCA, and DRM vis-à-vis inclusive and sustainable agricultural and rural development (ISARD);
b) Describe and explain generic processes and requirements on integrating CCA and DRM toward ISARD;
c) Appropriate the application of specific methodologies and tools for integrating CCA and DRM toward ISARD.

Intended Participants

The course is offered to government planners and technical staff at the regional, national, and local levels, researchers and practitioners from centers of excellence and private organizations, and representatives of non-governmental organizations (NGOs) who are interested in acquiring fundamental knowledge of CCA and DRM and their relationship to inclusive and sustainable agricultural and rural development.

Enroll now!

Deadline of Registration: 22 August 2015.

Online registration only. For more details, please visit this website: www.upou.edu.ph.

SEAMEO SEARCA · QPAN ADAPTATION NETWORK · OML Center

SEARCA Initiatives on Green Education

School Plus Home Gardens cum Biodiversity Enhancement and Entrepreneurship (SHGBEE)

The UC Summer School

- 2- to 3-week course in rural studies, agriculture and natural resource management focusing on the interdisciplinary approach in tackling the issue of food and nutrition security in the Southeast Asian region for sustainable development

- has evolved into a 2-credit course on *Assessment of Sustainability in Agriculture Production and Food Processing Systems* – under different agricultural systems

MS Food Security & Climate Change

Co-funded by the Erasmus+ Programme of the European Union

Master of Science in Food Security and Climate Change

Master of Science in Food Security and Climate Change

Core Courses	Program Core Competencies					
	1	2	3	4	5	6
Changing Climate and Its Impacts on Natural Resources, Agriculture and Food Security	✓		✓	✓	✓	✓
Food Security and Food Systems in a Dynamic Environment		✓			✓	✓
Impact Assessment and Evaluation of Projects and Policies			✓	✓		✓
Sustainability Assessment in Agricultural Production and Food Processing		✓		✓		✓
Research Methods						✓
Seminar						✓

MS FSCC Specialization Core Courses

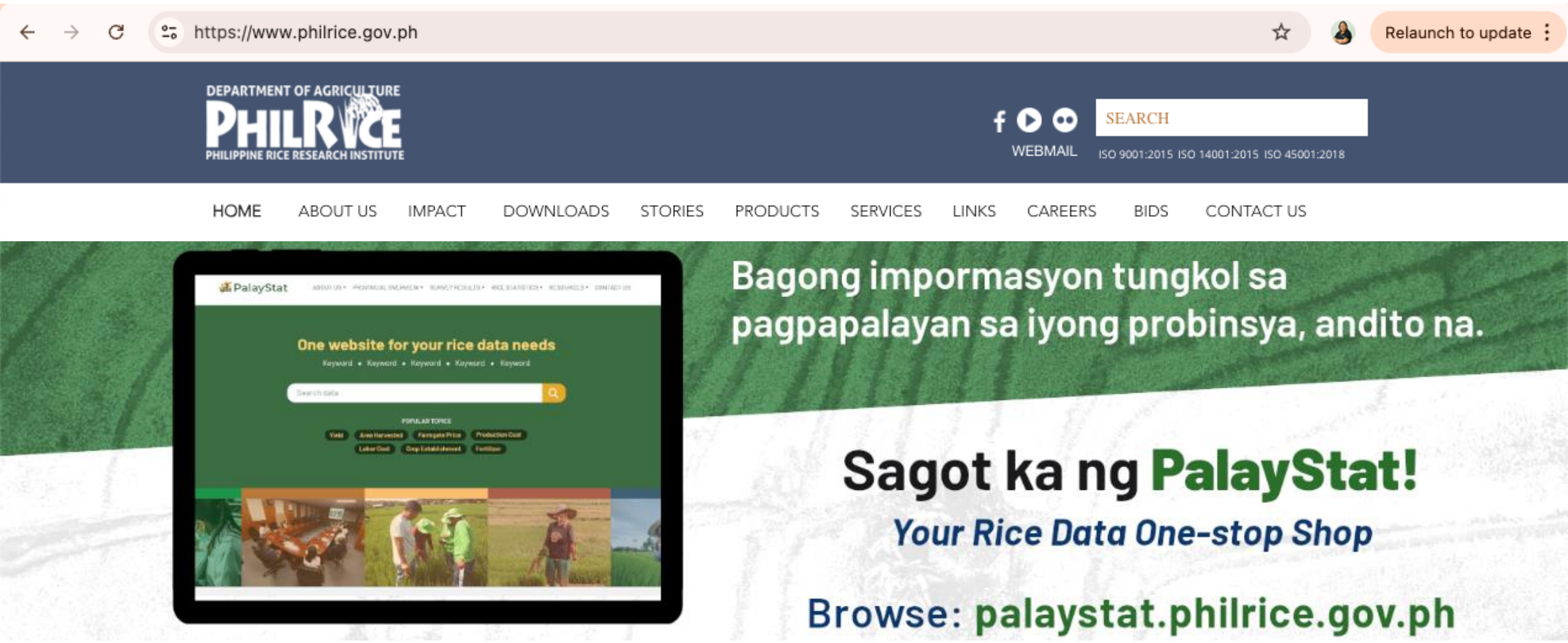
- Climate-Smart Animal and Crop Production Systems
- Forests in a Changing Climate
- Climate Risk Management for Food Security
- Economics and Policy Issues in Food Security and Climate Change

Postgraduate Micro-Credentials in FSCC

Co-funded by the
Erasmus+ Programme
of the European Union

PMC FSCC Modules

- Food security and nutrition resilience amidst climate change
- Carbon neutrality for a sustainable food system
- Risk assessment in food security and climate change
- Spatio-temporal analytics in food security and climate change
- Environmental leadership and communication skills



Philippine Rice Research Institute (PhilRice)

- Infomediary Campaigns
- Floating Gardens
- Alternative Energy Systems
- Rain Forecasting Systems

The Challenge to go Green

- The future of our region—and our planet—depends on how well we prepare young people to lead.
- Through green education, interdisciplinary STEM, we can build a new generation of changemakers in Southeast Asia. Students who don’t just adapt to the future—but actively shape it.
- If we can empower the youth to learn, create, and lead through sustainability-focused, technology-driven education, **if we can challenge them to go green, then the youth will not just be problem-solvers of tomorrow—but co-designers of a thriving planet today.**

SEAMEO SEARCA

Let us take up the challenge to go green!

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SEARCAseminars