

19 April 2023 | Face-to-face Event

Panel Session 5: Education, Capacity Building, and Partnerships

Guide Questions:

- What are the potential innovative approaches to carbon farming under Southeast Asian region context?
- What are the possible research and development areas in carbon farming for undergraduate & graduate students? Who are the possible funding institutions to support these and contact person?
- How can women community leaders be involved in green financing (eg., Microfinance targeting women and women-led businesses)?
- What is the relevant capacity building for officials from NGAs and LGUs for the design of policies and regulations that can effectively
 support the development of sustainable finance and sustainability reporting, monitoring, and verification to enhance, transparency in
 the sustainable finance ecosystem?



Education, capacity building and partnerships: carbon farming and sustainable land management in SEA

Dr Eleanor Milne - CSU/WOCAT eleanor.milne@colostate.edu

- Approaches to C farming
- Tools to assess C farming impacts
 - COMET Farm USA
 - FAO Exact: e-learning
 - The Carbon Benefits Project (CBP) tools
- Introduction to WOCAT and link with CBP

Dr Isabelle Providoli - CDE/WOCAT/University of Bern

isabelle.providoli@unibe.ch

- SLM Technologies and SLM Approaches in SEA
- Integrated Farming Systems
- Gender-lense to SLM
- Embedding sustainable agriculture topics into higher education and beyond

Reducing N2O emissions from soil Improving fertiliser timings and placements Reduce fertiliser use



Agricultural conservation practices that can increase organic carbon storage and promote a net removal of CO_2 from the atmosphere (from Paustian 2014).

| MANAGEMENT PRACTICE | INPUTS | LOSSES |
|---|--------------|--------------|
| Increased productivity and residue retention | \checkmark | |
| Cover crops | \checkmark | |
| Conversion to perennial grasses and legumes | \checkmark | \checkmark |
| Manure and compost addition | \checkmark | |
| No-tillage and other conservation tillage | | \checkmark |
| Rewetting organic (i.e., peat and muck) soils | | \checkmark |
| Improved grazing land management | \checkmark | |

INCREASEDC

REDUCED

Range of tools available to help estimate C/GHG impacts

Many with accompanying training materials!!



Whole Farm and Ranch Carbon and Greenhouse Gas Accounting System.

HOME TOOL INFO HELP







COMET

Farm

















Newsletter

Why should I use **COMET-Farm?**

USDA GHO methods What information do I need?

How are my results calculated?

Is my information safe?

Overview video

1111 11111

> How do Luse **COMET-Farm?**

> > (?) Need Help?

Range of tools available to help estimate

EX

- C/GHG impacts
- Many with accompanying training materials!!

'/www.fao.org/in-action/epic/ex-act-tool/training-and-webinars/e-learning/en/



| erview | | LA-ACT e-learning |
|---------------------|--|--|
| ite of tools | An e-learning course on the EX-Ante Carbon balance Tool has been released through a joint collaboration by the World Bank and FAO, with support from IRD. | Platforms |
| rtners | The e-course is permanently accessible for self-paced distance learning from | World Bank e-Institute (e-course |
| aining and webinars | both the FAO and WB websites, while in regular intervals also a guided Massive Open Online Learning Course is organized by the WB e-Institute. As part of | available) |
| -Learning | these learning events, users are guided through the online course by WB and | |
| | FAO specialists and can interact through targeted forum discussions. | FAO e-learning Centre (e-course available) |
| -ACT case studies | This e-learning course provides users with a first solid understanding and | |
| -ACT past projects | practical capability to use the EX-ACT tool at Tier 1 level of complexity. | |
| | | |

Range of tools available to help estimate C/GHG impacts

www.carbonbenefitsproject.org



Online tools to estimate GHG/C impacts of different land use/management scenarios

Users complete information on different land management changes

Produce a report of ghg/C impact

Carbon Benefits

Home About News Articles Current Activities

Training

Q

Access Tool

Partners Contact Us

Training

Quick Guide

Click Quick Guide to download a quick guide to the CBP tools which includes:

- 1. The methodology the tools use
- 2. Input and output data
- 3. A step-by-step guide to using the tools
- 4. Advantages of using the tools

CBP Online Training Videos

All CBP Training Videos are on You Tube on The Carbon Benefits Platform. Videos are available in English and Russian

CBP training videos 1-3 in English

CBP training videos 5-6 in English

Uploading a CBP report to WOCAT (1:08:27)

CBP training in Russian Day 1 CBP training in Russian Day 2 CBP training in Russian Day 3

Tutorials

- CBP General Tutorial Gives an overview of the entire CBP system and how to navigate it
- Project Description Module Tutorial This tutorial shows you how to set up your project activity areas on a map
- · Developing Land Use Scenarios For Your Project
- Measurement and Monitoring Tutorial
- Simple Assessment Tutorial
- Reports Tutorial Helps you create a GHG balance report and understand it
- Socio-Economic Tutorial

Data Collection



Below are some forms which can be used to collect land management information (Activity Data) needed to run the CBP tools. Forms are in English or Spanish. Thank-you to Marco Flores Maldonado and Matias Bosio for the Spanish Translation.

CBP Online Training Slides

To view/download the slides, click on the links below which will take you to the presentation on SlideShare:

- 1. Overview of the CBP tools
- 2. Describing your project spatially
- 3. Exercise 1 'An agroforestry project'
- 4. The Simple Assessment
- 5. Overview of a mixed landscape project for Exercise 3
- 6. The Detailed Assessment



English

Setting up a project

Point file for exercises 1 & 3

Possible Research and Dev Areas

- How can permanence of SOC gains be ensured?
- What are the trade-offs in terms of other ecosystem services?
- What are the impact of different SLM practices on SOC and net GHG emissions in different soil/climate conditions



About WOCAT

The World Overview of Conservation Approaches and Technologies (WOCAT) is a **global Network established in 1992**.

WOCAT supports the compilation, documentation, evaluation, sharing, dissemination, and application of sustainable land management (SLM) knowledge.

In 2014, WOCAT's growth and ongoing improvement culminated in being **officially recognized by the UNCCD** as the primary recommended Global SLM Database for best SLM practices.



World Overview of Conservation Approaches and Technologies

The Global Network on Sustainable Land Management







https://qcat.wocat.net

Main features of the WOCAT Global SLM Database:

 ✓ free upload and worldwide sharing of countries' good SLM practices in English, Spanish, French, Russian and Chinese

Global WOCAT SLM Database

- ✓ free access to 2000+ proven, field-tested SLM practices from over 130 countries
- ✓ database filter to find relevant SLM practices for specific landscapes, land uses etc.
- ✓ possibility to integrate national SLM good practices in national/project/global platforms through API

UNCCD parties and other reporting agencies are encouraged to enter and share SLM best practices in the WOCAT SLM Database, and report in PRAIS under "Implementation Framework"/"Actions on the ground" (section 7.4.1 of the PRAIS reporting manual)



SLM good practices in Database



Database Visitors

New York

neutrality



SLM Technologies / Approaches in SEA

WOCAT Database





Intercropping of orange trees with mungbean in mountainous areas (Cambodia)

ng practice that can inv



Assisted Natural Regeneration (ANR) (Philippines)

A process of rehabilitating degraded forest lands by taking advantage of trees already proving in the area.

PhileAT-SLM C

dy species, soil degradation and recurring disturbances

ight and to serve as fertili. time; (e) Suppressing the grass; and (f)







TECHNOLOGIES IN THE DIFFERENT ECOSYSTEM

| | Coast (0-10 ma | toi) Lot | wland (<100 manil) | Upland - Hillyland (1 | 00-500 masl) | Highl | land (>500 mast) |
|--|--|--|--|--|--|--|--|
| - | Levent todarda | And the second s | | A state of the sta | And : thoffed the side or even of the side of the side of the side of the side of the side of the side of the | Hard and a second secon | |
| | | | | | | | |
| COAST | LOWLAND | LOWLAND-UPLAND | LOWLAND-UPLAND- | UPLAND-HELLYLAND | UPLAND-HILI | YLAND-HIGHLAND | HIGHLAND |
| COAST LMangroves as Buffer | LOWLAND LAlternate Wetting and Drying | LOWLAND-UPLAND 1.Windbreaks | LOWLAND-UPLAND- L.Organic Based System of Fice Internification | OPLAND-HILLYLAND | UPLAND-HILI I. Littako-Growing 6 | vLAND-BIGHLAND | HIGHLAND LNatural Vegetative Strip |
| COAST LMangroves as Balflyr Igalent Vatural Lacentu | LOWLAND LAlternate Writing and Drying 2 In Seu Decomposi- tion of Binana's Static | LOWLAND-UPLAND 1 Windbreaks 2 Planted Vegetative Strip | LOWLAND-UPLAND- LOrganic Based System of Rice Internification | UPLAND-HILLYLAND 3.Vetiver Gravs System 2. Multi Storey Grouping | UPLAND-HILI I. Littliko-Growing 6 2.Residue Incorpera | NI AND HIGHLAND or Forest Enhancement | HIGHLAND LNatarol Vepetative Strip 2. Rainfol paddy rice terraces |
| COAST I.Mangroven an Buffer Against Xarparal Fascardy | LOWLAND LAIternate Wetting and Drying 2 As Set Decomposi- tion of Banana Statk 3 Connervation Tillage | LOWLAND-UPLAND 1 Windbreaks 2 Planted Vegetative Strip 3 Small Farm Reserved | LOWLAND-UPLAND- LOrganic Based System of Fice Internification | OPLAND-HELLYLAND 3. Vetiver Gravs System 2. Multi Storey Grouping 3. Small Water Imposoding Project | UPLAND-HILI I Littako Growing 6 2 Residue Incorpora 3 Teres as Bafferzon | vtano-liicitano or Forest Erbascement mes | HIGHLAND HIGHLAND LNatsrol Vegreative Strip 2. Rainfeel paddy rice terraces 3.Contour faming using bedgerow |
| COAST I.Mangroves as Buffer Against Natural Tacarda | LOWLAND LAtternate Writing and Drying 2 As Sea Decomposi- tion of Hamma Static 3-Comservation Tillage for Com. Production | LOWLAND-HPLAND 1.Windbreaks 2.Phantod Vegetative Sirip 3. Small Farm Kesetsoli | LOWLAND-UPLAND- LOrganic Resed System of Neo Internitification | UPLAND-HELLVLAND 3. Veticer Granc System 2. Mathi Storey Ceoping 3. Swall Water Imposeding, Project 4. Pressurg of Cogon | UPLAND-HILI 1. Littako Growing 6 2. Residue Incorpera 3. Trees as Bafferzor 4. Contour Straight 1 | <mark>vrland-Hickland</mark> or Forest Enhancement mon met Stoch Layout | HighLand HighLand Ukaturd Vegetarive Strip 2. Rainfol paddy rise terraces 3.Contour faming using bedgerow 4.Bodswall Terracing |
| COAST I.Mangroves as Baffer Against Satural Tincerds | LOWLAND LAlternste Wetting and Drying 2.16 Sciu Decomposi- tion of Bianna Statik 3.Gomervation Tillage her Gem Production H. Rerological Bagener- ing for Irregated Low- land Rice | LOWLAND-IJPLAND 1.Windbreaks 2.Planted Vegetative Sirle 3.Small Farm Reserved | LOWLAND-LPPLAND- LOrganic Based System of Fice Internification | OPLAND-HELLYLAND 3. Verliver Grave System 2. Marki Storey Cropping 1. Small Water Imposeding, Project 4. Pressing of Cogos 5. Firebreaks/Grandsreaks | UPLAND-HILI 1. Littako Growing 6 2. Residue Incorpora 3. Trees as Bufferzon 4. Contour Straght I 5. Sediment Traps | yl AND-BIGHLAND or Forest Enhancement mon ms Stoch Layput | HIGHLAND HIGHLAND L'Alataral Vapetarive Strip 2. Rainivé paddy rice terraces 3.Contras familie autorités 4.Rodewall Terracing 5. Groen bunds aut entellibation |
| COAST I.Mangroven as Buffer Against Natural Facestle | LOWLAND LAlternate Wetting and Drying 2.45 Stu Decomposi- tion of Bismina Static Dicomervation Tillage for Core: Production A. Recological Ingeneer- ing for Irrigated Low- land Rise 5. Medialed Rapid | LOWLAND-UPLAND 1.Windbreaks 2.Planned Vegetative Strip 3. Small Farm Reserved | LOWLAND-UPLAND- LOrgence Based System of Fice Internification | UPLANG-HELLYLAND 3. Velicer Grans System 2. Multis Storry Gropping 1. Sould Water Impounding, Project 4. Pressing of Cagos 5. Princhenka/Gromolevako 6. Sweet Potatu Relay Cropping | UPLAND-HILI I. Littulos Growing 6 2. Residue Incorpora 3. Trees as Bufferon 4. Conteur Straught I 5. Sediment Traps 6. Highly Doversib | AYLAND-HIGHLAND or Forest Enhancement mos es Boch Layput of Gropping in Use | HIGHLAND HIGHLAND L'Alataral Waptusive Strig 2. Rainfold paddy rice terraces 3.Contour families using bedgerow 4.Rockwall Terracing 5. Store bunds and small basis 6. Seed Production of small-purpos himbly/Pagement |
| COAST IMangsoves as Ballyr Against Satural Tinaeetie | LOWLAND LAiternarie Wetting and Doring 2.4 a Seu Decomposi- tion of Hamana Stark 3. Conservation Tillage for Core Production A. Ecological Bageseri- land Fore 5. Modified Rapud Campositing | LOWLAND-UPLAND 1 Windbreaks 2 Planned Voystance Strip 3 Small Farm Senstruk | LOWLAND SPLAND Lörgene Rused System of Poor Anymithesison | UPLAND-HELLYLAND 3.Veriver: Grav System 2.Maris Storry Cropping 3.Sould Wirer: Imposeding Project 4. Prevaing of Cagon 5. Strafewaka/Grambinaka 6. Sweet Proatu Relay Cropping | UPLAND-HILI 1 Littuko Growing 6 2.Residue Incorpera 2.Trees as Bufferzos 4. Contear Straight 1 5. Sediment Traps 6. fughty Diversible retilis | CYLAND-HIGHLAND or Forest Enhancement mos est Sforh Layout el Gropping in Live | HERLAND HERLAND UNatoril Vigotoriv Strip 2. Radioli publy rise torraces 3.Contrast faming using integroup 4.Rodwall Torracing 5. Store books and instit basin dated "noticities of andi-pupper shinds", generation and any generation. |
| COAST I.Mangroven an Baffur Against Swateral Taxaethe | LOWLAND LAbrense Wetting and Dying 2.6 Sec Decomposi- tion of Hanna Statis 3.6 over-values Tilling in Comervation Tillin | LOWLAND-UPLIND I.Windbreaks ZPJanned Vogetatele Strip 3: Small Farm Heartwell | LOWLAND UPLAND LOrgane Rused System of Poor Ameridication | UPLAND-HELLYLAND 3.Verliver Crass System 2. Mails Sturry Cropping South Water Ingestuding Project 4. Pressing of Cogos 5. Sirolewaka/Grombinalis 6. Sweet Proto Relay Cropping 7. Lingerow Eastway Under- Gases | UPLAND-HILI 1. Littako Growing () 2. Residue Incorpora 3. Trees as Bufferon 4. Contour Straight () 5. Sediment Traps 6. flighty Diversible refils 7. Sugar mill wars Revues for Irrigan | VILAND-HIGHLAND or Forest Fishancoment tion we fisch Layout et Groupping in Live e water e water | HIGHLAND HIGHLAND URdard Wapcatwin Shrip 2. Kalonla gaddy rise terrators 2. Koolwall Terrators 2. Koolwall Terrators 2. Koolwall Terrators 3. Koolwall Koolwall 3. Coper Maching 3. Coper Maching |











LIFAD WOCAT





Philippine Case Studies on Sustainable Land Management **Approaches and Technologies**





Integrated farming systems



Integrated farming systems (IFS) evolved with the aim to **combine multiple crops** (e.g., cereals, legumes, tree crops, vegetables) and **multiple enterprises** (e.g., livestock, apiary, aquaculture) **on a single farm** in an integrated manner (Behera et al., 2015).

Picture: Tim Sophea, RUA

IFS include a combination of different SLM Technologies each of them aiming at a specific benefit

... but may also :

include «synergies» between different SLM Technologies: e.g. farm manure from livestock is used for improved vegetable gardens, rice straw is used for mulching of vegetable gardens, etc.



Increased C inputs

- Residue retention
- Cover crops
- Manure & compost
- ...

 \checkmark



Reduced C loss

- ✓ Conservation tillage
- Conversion to perennial grasses & legumes





Adding a gender lens to Sustainable Land Management

- assess the gender responsiveness of SLM practices
- evaluate how gender responsiveness of SLM Technologies and Approaches can be improved, stepping up adoption and dissemination, making SLM beneficial for women and men alike
- support project planners, designers and implementers to identify, implement and scale gender-responsive SLM Technologies and Approaches



Embedding sustainable agriculture topics into higher education and beyond

- Agroecology / SLM / carbon farming / integrated farming need to be included into higher education teaching
 - ✓ Systemic perspective of farming and landscapes
 - ✓ Tailored solutions for specific agro-ecological zones
 - ✓ Integrated participatory approaches
- Education for Sustainable Development (ESD) approaches need to be included into higher education
 - ✓ A broad range of competences need to be built (academic knowledge, skills and attitudes)
 - Combination of innovative didactics, new teaching-learning arrangements link to practice / field
- Building on **national / regional / global Databases**
 - ✓ Global WOCAT network, <u>www.wocat.net</u> and others
- Link **outputs of implementation projects** with higher education curricula
 - $\checkmark\,$ Tools developed and evidence generated



Working Towards Sustainable Land Management (SLM) A collection of SLM Technologies from Cambadia









an da anticipation and a second a second and a second a secon





Pilot project: develop a Sustainable Development and Sustainable Land Management / Agroecology <u>curriculum at RUA</u>

Collaborative process

Co-design of curriculum for the RUA and other agriculture-focused higher education institutions in Cambodia.

- Including systemic perspective and tailored solutions for specific contexts
- Including participatory processes between science and practice



Climate-resilient integrated farming systems – SUCRA project



Figure 3. Simplified illustration of the identified General Landscape Units for IFS implementation. 1: Homestead (GLU1), 2: Homestead with Rice (GLU2), 3: Chamkar (GLU3).

Homestead – IFS including artificial pond and aquaculture (GLU1 – IFS M3)



purpose crops, small livestock, and artificial pond and aquaculture: 1: Farmhouse 2: Pond with fish 3: Irrigated leafy vegetables 4: Irrigated climbing/fruit vegetables 5: Agroforestry with fruit trees 6: Banana, herbs along walk path

Vegetables, fruit trees, multi-

- 7: Small livestock (chickens, ducks)
- 8: Wells
- 9: Water storage tanks
- 10: Vegetable nursery

11: Living fence, multipurpose trees, indigenous trees

Photo: Hanspeter Liniger

\rightarrow Integration into teaching at RUA



Tim et al. 2023



















ICIMOD