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AGRICULTURAL RESEARCH FOR DEVELOPMENT

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Environmental accounting and hands on data for indicator production on integrated approach

Vocational training CIRAD

02-06 September 2019
Montpellier, France

This project is funded by the European Union and is implemented by the European Environment Agency

ENI SEIS II East

17 PARTNERSHIPS FOR THE GOALS

CIRAD

CIRAD, the French Agricultural Research Centre for International Development, is an organization working for the sustainable development.

Status

CIRAD is a public establishment (EPIC) under the joint authority of the Ministry of Higher Education, Research and Innovation and the Ministry for Europe and Foreign Affairs.

Activities

Its activities concern the life sciences, social sciences and engineering sciences, applied to agriculture, food, the environment and territorial management. Its work centres on several main topics: food security, climate change, natural resource management, reduction of inequalities and poverty alleviation.

Training and knowledge sharing

CIRAD belongs to numerous European and international networks, and facilitates access for its partners to EU programmes and their involvement in international scientific cooperation networks.

Training, dissemination of information and knowledge and innovation sharing naturally complement CIRAD's research mandate by giving its partners and development players the means to make the choices incumbent upon them.

CIRAD offers up-to-date knowledge, modern facilities and pedagogic skills in application of international frameworks such as the UN SEEA, the United Nations Frameworks for the Development of Environment Statistics (FDES) and the Sustainable Development Goals indicators. Covering these methodologies with consideration of the capacities in connecting scientific expertise and policies to contribute in addressing concerns about environmental indicators, data comparability and a regular reporting across the pan-European region.

CIRAD is an Eionet partner, duly declared by the French Ministry of Ecology. It has the capacity to organise the preparation of the data, provide excellent infrastructure and carry out the training session itself. In addition, as part of a consortium with the Quebec University in Montreal (UQAM), CIRAD organises educational and vocational programmes and trainings on ecosystem natural capital accounting and, in 2016, it ran a summer school under the UN CBD patronage.

The ENI SEIS II East project

The EEA is implementing the EU-funded ENI SEIS II East project to support the environmental reporting process (conventions, treaties, national obligations…) with contribution to the pan-European reporting. The **European Neighbourhood Instrument (ENI)** came into force in 2014. It is the financial arm of the European Neighbourhood Policy, the EU's foreign policy towards its neighbours to the East and to the South.

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The ENI SIES II East project aims to strengthen the regular production of environmental indicators and assessments in line with the principles of the Shared Environmental Information System (SEIS) as a contribution towards knowledge-based policymaking and good environmental governance in the six Eastern Partnership countries.

The 1st Regional Project Steering Committee of the ENI SEIS East II meeting held in November 2016 stressed the priority need for Environmental Accounting (SEEA) capacity building. This need for the action has been taken into account and been added to the Regional work plan of the project 2017-2020.

The activities support the strengthening environmental statistics and accounting, in particular through the application of the UN System of Environmental-Economic Accounting and the revised UN Framework for the Development of Environment Statistics standards through the development of capacities of the six Eastern Partnership countries' experts. Thus will assist to modernise **a regular reporting on environment knowledge based and relevant.**

State of play of the SEEA implementation in Eastern Partnership countries

The first activity of the ENI SEIS II East project on the implementation of environmental accounting focused on analysing the state of play and structuring capacity building in respective activities.

In 2017, this is done using the Self-Assessment Diagnostic tool of SEEA implementation in order to measure the readiness of countries (data availability, institutional and human capacity,) and identify area of work to start. Key findings indicated that the SEEA is an emerging component, which is included in national statistical programmes led by NSOs. Priority areas for the SEEA include land accounts, air emission accounts, water accounts and environmental protection expenditure accounts.

2017 EEA study of efficiency and effectiveness of recent environmental assessment reports in the eastern partnership countries consider to sustain and use of modern tools and techniques for environmental assessment, including environmental economic accounting.

In 2019, an assessment of SEEA implementation has shown progress in six eastern countries. On regular basis produced and published accounts in Armenia (water emissions, supply and use table for water in physical and monetary units), Azerbaijan (energy assets and physical supply and use tables for energy), Georgia (material flow), Moldova (air emission accounts), and Ukraine (air emission accounts).

Notably, stakeholders' interest in ecosystem-based approaches to environmental accounting is also taken into consideration, with; for example, focus on land, carbon, water, biodiversity, and their contribution to the national economy.

The vocational training on environmental accounting

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The second activity of the ENI SEIS II East project includes in delivering the vocational trainings that covered the main aspects of the international standard UN System of Environmental-Economic Accounting (or SEEA) with focus for land, water, carbon, ecosystem services and biodiversity. It is designed to provide a broad understanding of the environmental accounts for professionals responsible for implementing, developing, or using environmental accounts.

According to the regional work plan, the first cycle of training on environmental accounting started in 2017, to build capacities in facilitating the implementation of the SEEA in the region from 2018. This vocational training covered induction to environmental accounting and was based on the SEEA-CF and the SEEA-EEA and its development at the European Environment Agency (EEA). The focus was on land cover accounts as the first step in environmental accounting implementation following the EEA methodology and relied in particular on the EEA's 10 years' practical experience in producing and disseminating these accounts.

In 2017, the training identify a lack of environmental information systems/platform/land data platform in six countries and their weakness in use and knowledge of GIS in environmental and statistical authorities. This is a main obstacle to the development of environmental accounts, which are based on spatial approach.

Photo credit: © EEA

Therefore, in 2018, the trainings were covering land, water and biodiversity accounting developments in data availability in six Eastern countries.

In 2019, an objective of the training is focusing on institutional capacity development and production of new generation of indicators in order to implement land accounts and set up environmental information systems. The 2019 vocational training will cover respectively land module.

The first purpose of this training is, by doing, to raise awareness on accounts feasibility with current technology. The second is providing participants the opportunity of understanding the practical usefulness of land accounts in their national context.

Who is the vocational training for?

The regional vocational training (five days) 2-6 September 2019 cover the participation of 3 experts per country from the six Eastern partnership countries: Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine. National team of experts will consist of 1 expert from environmental authorities with policy and data/ indicators compilation experience, 1 expert from statistical authorities with data handling experience, 1 experts from Land/ Cadastral /Spatial authorities with GIS background.

Key contents

The programme of the 2019 Vocational training is designed to address the following key questions:

- What are the perspectives of environmental accounting to measure the land policy sustainability?
- What are the fundamentals of environmental accounting for land sustainability?
- What is changing in environmental accounting use to assess land use sustainability?
- What new challenges in the environmental accounting arena call for a new type of knowledge and new indicators?
- How can environmental accounting with integrative approach respond to such knowledge requirements?
- How can we effectively combine and apply different methodologies and tools in specific working contexts on land of environmental accounting?

The five-day programme

The overall programme covers the why, what and how of environmental accounting will go to an Integrated Sustainability Assessment.

In 2019, the EEA will focus on institutional capacity development and production of new generation of indicators in order to implement land accounts and set up environmental information systems. The 2019 vocational training will cover respectively land module. Theory and practice will be reinforced through hands-on exercises with national data. To address above-mentioned needs and using of outcomes from national pilot of CORINE Land Cover in six Eastern Partnership countries as following:

-Production of land cover and land cover change accounts following SEEA approach to monitor the land degradations using natural capital approach (SDG indicator 15.3.1).

-Analysis of stress factors that caused of urban sprawl (SDG Indicator 11.3.1), agriculture extension (SDG Indicator 2.4.1.), deforestation (SDG Indicator 15.1.1., SDG Indicator 15.1.2.) and land uptake.

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Agenda

Day 1 – 02 September 2019	
8:45 – 9:00	**Registration**
9:00 – 9:30	**Introductive "tour de table »**
Session I: Purpose of environmental accounting	
9:30 – 13:00 **11:00 – 11:30/coffee break**	**1. Introduction to the training course** • ENI SEIS project II East: building capacities in environmental accounting • Environmental Accounting: an overall framework and specific developments and experimentations: SEEA CF, SEEA EEA, WB WAVES, UNCBD ENCA QSP, the European INCA programme and its components • Environmental accounting with integrative approach respond to new knowledge requirements (Rio Conventions, MEAs and SDGs monitoring, reporting and accountability). **2. Land and Ecosystem Accounts at the EEA:** • An accounting methodology based on Corine land cover • Introduction to the LEAC methodology • LEAC 1990-2000-2006-2012-2018 • Online access to LEAC on the EEA website: demo **3. New challenges in the environmental accounting arena call for a new type of knowledge and new indicators:** • An indicator derived from land cover accounts: Net Landscape Ecosystem Potential (NLEP) • Land cover, land use and carbon accounts: links of LEAC to LULUCF • Land cover and ecosystem service mapping and assessment: the MAES experience • Land accounts as the foundation of integrated ecosystem accounting
13:00 – 14:30	**Lunch break**
14:30-17:00 **15:30-16:00/coffee break**	4. **Perspectives of environmental accounting to assess the sustainability** of land policies (CORINE Land Cover in EU and the EEA: process and results) **5. Remote sensing as a tool to produce information on landscape/land cover and land use** • Introduction to remote sensing • National experience in use of Earth observation data for environmental assessments (presentations by delegates for each country, 15 mn, 10 slides max) • Copernicus : role and land observation programme to measure natural capital degradation **6. Site visits (optional)** • Visit of satellite antenna site • Visit to the CIRAD laboratory GEOSUD (data processing, analysis and dissemination)

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Day 2 – 03 September 2019	
Session II: Test case on land cover accounting : the making of LEAC	
09:00 – 13:00 **11:00 – 11:30/coffee break**	**7. Introduction to the LEAC exercise** • Presentation of the LEAC methodology for land cover change accounting • Land cover data for accounting: minimum classification detail, the SEEA requirements • land cover change and land cover flows • the land cover change matrix and the LEAC flatmatrix • presentation of results: tables, indicators and maps. 8. **Presentation of and gripping in the hand on the tools and datasets** which will be used for the exercise: • Opening the QGIS/SAGA Gis software package • Upload of the land cover tiles 2000 and 2015 (pseudo-CORINE layers supplied by VITO and IGNFI) • Upload of the Administrative boundaries shapefiles (GDAM files) and National parks boundaries (WCMC-WDPA/JRC-DOPA) 9. **Extraction of national land cover from the files: practical exercise**
13:00 – 14:30	**Lunch break**
14:30-17:00 **15:30-16:00/coffee break**	**10. Production of the matrix of land cover change 2000-2015: practical exercise** 11. **Discovery of the Flatmatrix for converting land cover changes to land cover flows of consumption and formation**; use of the LEAC Flatmatrix for producing the accounts 12. **Extraction of results by countries, regions, districts, national parks…** 13. **Presentation of the results: tables and maps**
Day 3 – 04 September 2019	
Session III: Test case on land cover accounting : analysis and developments	
09:00 – 13:00 **11:00 – 11:30/coffee break**	14. **Stock-taking of outcomes of Session II** **15. First analysis, comparisons and comments** • Land cover stocks and flows by administrative divisions • Land cover stocks and flows in protected areas **16. Indicators derived from LEAC :** • Typical indicator: Urban land uptake (EEA Core Set, UNECE…) • Other indicators: 1. Urban ○ Urban temperature: the urban influence on the neighbourhood (e.g. on protected areas): exercise for year 2015 ○ Urban density change: ▪ Combination with the urban density fraction layer of VITO/Dynamic Land Cover

	▪ Combination with high resolution layers: Corine urban high resolution layer, Global Urban Footprint: presentation ○ Forests: ▪ Forest extent change: what is deforestation, what is normal forest exploitation? Discussion ▪ Forest density change: • Combination with the urban density fraction layer of VITO/Dynamic Land Cover • Combination with high resolution layers: Corine high resolution forest layer, Global Forest Change (U Maryland): presentation ○ Agriculture: ▪ Large scale agriculture vs. mixed agriculture landscapes: identification and meaning ▪ Loss of agriculture land vs. farmland abandonment
13:00 – 14:30	**Lunch break**
14:30-17:00 **15:30-16:00/coffee break**	**17. A first step from LEAC to Ecosystem accounts: Net Landscape Ecosystem Potential** • Presentation, format of the composite indicator • Green background Landscape index (GBLI): presentation and calculation 2000-2015 • High Nature value of landcover (NATURILIS): presentation and calculation (from WDPA) • Fragmentation index (MEFF): presentation – results given • Calculation of NLEP 2000 and 2015 • Assessments and comparisons with NLEP: by administrative divisions and for protected areas
Day 4 – 05 September 2019	
Session IV: Implementation of LEAC (and ecosystem natural capital accounts)	
09:00 – 13:00 **11:00 – 11:30/coffee break**	**18. The land cover data for accounting** • EU: Corine land cover • The pseudo-Corine maps used for the LEAC training : based on dynamic land cover classification by fractions **19. The dynamic land cover classification by fractions** • Presentation of the methodology based on ProbaV and outcomes • Annual updates available • Perspectives with the Sentinel 2 and 3 **20. Implementing LEAC based ecosystem natural capital accounts** • The basic modules: ○ Ecosystem infrastructure accounts (land cover and rivers accounts, NLEP and biodiversity) ○ Ecosystem carbon account ○ Water account

	○ Integrated assessment of ecological value and measurement of ecosystem degradation or enhancement • The data model 21. **Making it possible: an IT platform for producing natural capital accounts: the SYS4NCA project** 22. **Examples of ecosystem accounting case studies in and out of Europe (based on LEAC)** ○ The Rhône River Basin integrated ecosystem accounts ○ PapBIO: ENCA accounts for the governance of the Niokolo-Koba National Park in Senegal ○ ECOSEO: Accounts for the coastal entities of the Guyana Shield
13:00 – 14:30	**Lunch break**
14:30-17:00 **15:30-16:00/coffee break**	23. **Uses of LEAC for reporting on environment and sustainable development** • Back on the SDGs: Analysis of stress factors that caused of urban sprawl (SDG Indicator 11.3.1), agriculture extension (SDG Indicator 2.4.1.), deforestation (SDG Indicator 15.1.1., SDG Indicator 15.1.2.) • Reporting to UNECE and Environment for Europe • Policy interest in the national context, requirements for implementing land accounts in countries: data, capacities
Day 5 – 06 September 2017	
Session V: Perspectives for integrated environmental accounting	
9:30 – 13:00 **11:00 – 11:30/coffee break**	24. **What have we learn about monitoring and assessing land use sustainability with land cover accounts?** • General findings • Country findings 25. **How can we effectively combine and apply different methodologies and tools in specific working contexts on land of environmental accounting?**
13:00 – 14:30	**Lunch break**
14:30-17:00 **15:30-16:00/coffee break**	26. **Countries Self-Assessment of the readiness of countries (data availability, institutional/human capacity...) to implement the SEEA land module** 27. **National roadmaps to implement land accounts within the ENI SEIS II East project.** 28. **Evaluation of the vocational training**
	End of the training

Programme and learning approach

The 2019 vocational training will cover respectively land module. Theory and practice will be reinforced through hands-on exercises with national data.

the 2019 training aims at exercising the participants with real hands on data on their respective countries with the purpose of providing the sense of the tasks to be carried out as well as better understanding of the policy usefulness of the project's outcomes, maps, accounts and indicators.

A **combination of learning methods** is used – from lectures to case-studies analysis and practical exercises. Participants are called upon to make use of their **creative potential**, in a critical and **reflexive attitude** towards their own personal and organisational experience. A **diverse group** of participants is expected. The learning path approach enables the course to link to participants' specific contexts and background. Particular attention is devoted to **knowledge transferability** into working realities.

Library of documents for pre reading:

1. Land Cover Accounts (LEAC) Methodology, EEA, https://www.eea.europa.eu/data-and-maps/data/land-cover-accounts-leac-methodology-tests
2. Land accounts for Europe 1990-2000, EEA, https://www.eea.europa.eu/publications/eea_report_2006_11
3. ECOSYSTEM NATURAL CAPITAL ACCOUNTS: A Quick Start Package, https://www.cbd.int/doc/publications/cbd-ts-77-en.pdf
4. SEEA Central Framework, UN SD, 2012, https://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf
5. System of Environmental-Economic Accounting 2012: Experimental Ecosystem Accounting - final, official publication, 2014, https://unstats.un.org/unsd/envaccounting/seeaRev/eea_final_en.pdf
6. Landscape in transition, EEA, 2017, https://www.eea.europa.eu/publications/landscapes-in-transition
7. Natural accounting in support of policymaking in Europe, 2019, https://www.eea.europa.eu/publications/natural-capital-accounting-in-support
8. Copernicus in support of the UN sustainable development goals, https://www.copernicus.eu/sites/default/files/2018-10/Copernicus_SDG_Report_July2018pdf.pdf
9. Satellite earth observations in support of the Sustainable Development Goals: Special 2018 edition, http://eohandbook.com/sdg/files/CEOS_EOHB_2018_SDG.pdf
10. SCOPING STUDYON ENVIRONMENTAL-ECONOMIC ACCOUNTING TOWARDS THE PRODUCTION OF AN INTEGRATED INFORMATION SYSTEM AND INDICATORS FOR THE THREE RIO CONVENTIONS, UN CBD, 2016
11. Assessment of self-assessments of System of Environmental-Economic Accounting progress in the Eastern Partnership countries (SEIS II East project), Working paper, EEA, 2017

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Venue and practical information

The 2019 Vocational training on environmental accounting will be held from **02 to 6 September 2019** (5 full days) at the **CIRAD** premises in **Montpellier, France**: Maison de la Télédétection- 500, rue Jean-François Breton.

Attendance is **free of charge**. Participants from the six Eastern Partnership countries (EaP) will be funded by the ENI SEIS East project and also travel arrangements will be made through the project.

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List of participants

Name	Organisation	Country
Naira Mandalyan	Statistical Committee	Armenia
Gevorg Azgaldyan	Forest Monitoring Center SNCO	Armenia
Garik Grigoryan	Ministry of Environment	Armenia
Ilkin Shahvaladov	State Statistical Committee	Azerbaijan
Ilgar Valiyev	State Statistical Committee	Azerbaijan
Khanlar Mustafayev	Ministry of Ecology and Natural Resources	Azerbaijan
Ekaterina Istomina	Belhydromet	Belarus
Yuliya Sai	National Statistical Committee	Belarus
Halina Shyla	National Statistical Committee	Belarus
Vasil Tsakadze	National Statistics Office	Georgia
Daviti Kobakhidze	Ministry of Environment Protection and Agriculture	Georgia
Maka Manjavidze	Ministry of Environmental Protection and Agriculture	Georgia
Ovdii Maria	Agency for Land Relations and Cadastre	Moldova
Ludmila Lungu	National Bureau of Statistics	Moldova
Silvia Nicolaescu	Environmental Agency	Moldova
Olena Legka	Ministry of Ecology and Natural Resources	Ukraine
Pavel Sokolov	The State Service for Geodesy, Cartography & Cadastre	Ukraine
Olga Martyniuk	State Statistics Service	Ukraine

If you have any questions regarding the 2019 Vocational training, please feel free to contact Dr. Jana Tafi jana.tafi@eea.europea.eu and Dr. D.Babin didier.babin@cirad.fr.

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