Assessment of self-assessments of System of Environmental-Economic Accounting progress in the Eastern Partnership countries (SEIS II East project)

Working paper

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1. Introduction

The assessment of self-assessments was undertaken by the European Environment Agency (EEA) under the European Neighbourhood Instrument (ENI) Shared Environmental Information System (SEIS) II East project in collaboration with the Statistics Division of the United Nations Economic Commission for Europe (UNECE). This study responds to the request by the first steering committee meeting of the national focal points (NFPs) to carry out an assessment of the current status of national implementation of environmental economic accounting, in order to identify priorities and future plans.

The assessment was carried out in two phases to increase the number of respondents. Phase 1 was a self-assessment of progress in the implementation of the System of Environmental-Economic Accounting (SEEA). It was addressed to respondents who were the NFPs of the ENI SEIS II East project. The NFPs were nominated by and represent their ministries of environment and national statistical offices (NSOs). They were interviewed up to 30 May 2017. Phase 2 consisted of a follow-up of the survey, which focused on interviewing the national experts who were attending training sessions on environmental accounting. The SEEA training was organised by the EEA and carried out by the CIRAD (French Agricultural Research Centre for International Development under the joint authority of the Ministry of Higher Education and Research and the Ministry of Foreign Affairs and International Development) from 26 August to 1 September 2017, at the Maison de la Télédetection in Montpellier, France.

The assessment covered general information on environmental-economic accounting progress within the countries. It included questions on the institutional infrastructure, priority subject areas, constraints faced in the implementation of the programmes and countries' future plans.

The assessment was dispatched for review and completion on 30 May and 31 August 2017, respectively, to the six Eastern Partnership countries (hereafter the six eastern countries). A brief description of the questionnaire, its structure and organisation are presented in Annex 1.

This report presents the main findings of the assessment. It is organised as follows: Chapter 2 is a summary of the main conclusions. Chapter 3 describes the institutional infrastructure of environmental-economic accounting programme, their effectiveness in the six eastern countries and their location within the institutions. Chapter 4 presents the scope of these programmes in terms of the subject areas covered, the use of the accounts and future plans. Chapter 5 assesses the opportunities and limiting factors of the development and compilation of environmental-economic accounts. Chapter 6 summarises the assessment of the self-assessments in the six eastern countries, and details the technical assistance and funding used in the compilation of environmental-economic accounting. Chapter 7 includes a road map and presents the different stages and steps in which the SEEA can be built.

2. Summary of the conclusions

The assessment indicated that environmental-economic accounting is an expanding component of national statistical programmes led by the NSOs in the six eastern countries. The environmental-economic accounting started within the environmental statistics programme in Armenia, Belarus and Ukraine and in the energy statistics programme in Azerbaijan. These countries have demonstrated further development of environmental and economic accounting in terms of expanding the coverage and including new modules. Two countries (Moldova and Georgia) are in the initial stages of development.

Considering that environmental-economic accounting is a relatively new area, it is noteworthy that of the six countries that responded to the assessment two have regularly compiled accounts (Azerbaijan and Ukraine) and two have started pilot environmental-economic accounting programmes (Armenia and Belarus). In addition, the two countries that are not currently compiling environmental-economic accounts have indicated that they are planning to start in the near future (Moldova and Georgia).

The six countries are ready to start SEEA activities, taking an integrated assessment perspective, including spatial analysis, on the basis of expressions of interest from environmental authorities that are committed to supporting their environmental reporting processes, including to the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (UN CBD) and the United Nations Convention to Combat Desertification (UNCCD). This would bring the number of countries compiling environmental accounts to six (100 %).

Air emission accounts and energy accounts are among the most commonly compiled modules, driven by policy requests to measure energy efficiency within national security concerns (energy and food).

Priority areas for further expansion in the eastern countries have been identified as:

- land accounts
- air emission accounts
- water accounts
- environmental protection expenditure accounts.

All countries identified the lack of human and financial resources as the most common factors impeding the development and implementation of environmental-economic accounting programmes. Furthermore, in compiling these accounts, the lack of data and its poor quality presented serious difficulties.

Table 2.1 shows the summary of the SEEA progress in the six eastern countries.

Table 2.1 Summary of the SEEA progress in the six eastern countries

	Armenia	Azerbaijan	Belarus	Georgia	Moldova	Ukraine
SEEA Central framework						
Natural resource accounts						
2.1.Land cover accounts	F	F	F	F	F	F
2.1.1.Physical asset accounts for land (land cover and/or land use)		F	F	F	F	
.1.2.Monetary asset accounts for land (land cover and/or land use)						
2.2.Forest accounts	F		P,2018/F			
2.2.1.Physical asset accounts for timber resources			P,2018/F			
2.2.2.Monetary asset accounts for timber resources						
2.3.Water stock accounts	F			F		
2.3.1.Physical Asset accounts for water resources			P,2017/F		P,2000	
2.4.Mineral and energy asset accounts				F		
2.4.1.Physical asset accounts for mineral and energy resources		R,2016				
2.4.2.Monetary asset accounts for mineral and energy resources						
Physical and hybrid flow accounts						
2.7.Air emission accounts	F			F	P,2017/R	R,2015
2.8.Water emission accounts	P,2017/R					
2.9.Water flow accounts	P,2017/R			F		
2.9.1.Physical supply and use tables for water	P,2017/R		P,2016/F		P,2000	
2.9.2.Monetary supply and use tables for water	P,2017/R		P,2018/F			
2.10.Energy and material flow accounts				F		
2.10.1.Physical supply and use tables for energy		R,2016	P,2018/F			
2.10.2.Monetary supply and use tables for energy						
2.10.3.Full set of supply and use tables for materials						
2.10.4.Economy-wide material flow accounts (MFA)						
2.11.Waste accounts	F					
Environmental activity accounts						
2.12.Environmental protection expenditure accounts (EPEA)	F	F	P,2018/F	P,2001		F
2.13.Resource use and management accounts (RUMEA)						
2.14.Environmental subsidies account	F					
2.15.Environmental taxes account	F					
2.16.Environmental goods and services sector accounts (EGSS)	F					
SEEA Experimental Ecosystem Accounts	F	F	F	F	F	F

Notes: F, future; P, project; R-regular.

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

The road map presented in Chapter 7 highlights some aspects to consider for successful planning and implementation. It aims to provide basic recommendations and to further develop environmental accounting in the six eastern countries. It suggests:

- Start with land accounts (SEEA-Central framework (SEEA-CF) land and ecosystem accounts) and then ecosystem natural capital accounts for carbon, forest and water ecosystems.
- Closely connect work with the reporting requirements of ongoing policy processes within the country, such as the Sustainable Development Strategy, the OECD's Green Growth strategy and UNEP's Green Economy strategy, and the overall Sustainable Development Goals and Targets.
- Create ad hoc working groups and an inter-institutional steering committee and hold regular meetings to maintain inter-ministerial dialogue.

- Produce accounts and communicate the results to the relevant national stakeholders.

The road map presents different steps in which the SEEA can be implemented. For the SEEA, land cover information and data important points of departure, in particular considering ecosystems. Maps of land cover and change constitute as well basic building blocks of environmental information aimed in their own at informing policies.

3. Institutional infrastructure

In the assessment, a number of questions aimed to identify the availability of environmental-economic accounting programmes in the six eastern countries (whether in the responding institution or in other institutions).

For the purposes of this assessment, the questions were defined and the respondents were identified to analyse progress of the implementation of any part or module of the accounts, in physical and/or in monetary terms.

The assessment was conducted via interview. The approach taken was based on that followed by the United Nations Statistical Division (UNSD) Global assessment of Environment Statistics and Environmental-economic accounting assessments 2007 [1] and the 2017 UNSD Self-Assessment tool for SEEA implementation. The target audience was composed of the potential producers and users of environmental accounts from statistical offices and environmental authorities.

Table 3.1 shows the response rate to the assessment in the six eastern countries

Table 3.1 Self-assessments process and responding countries

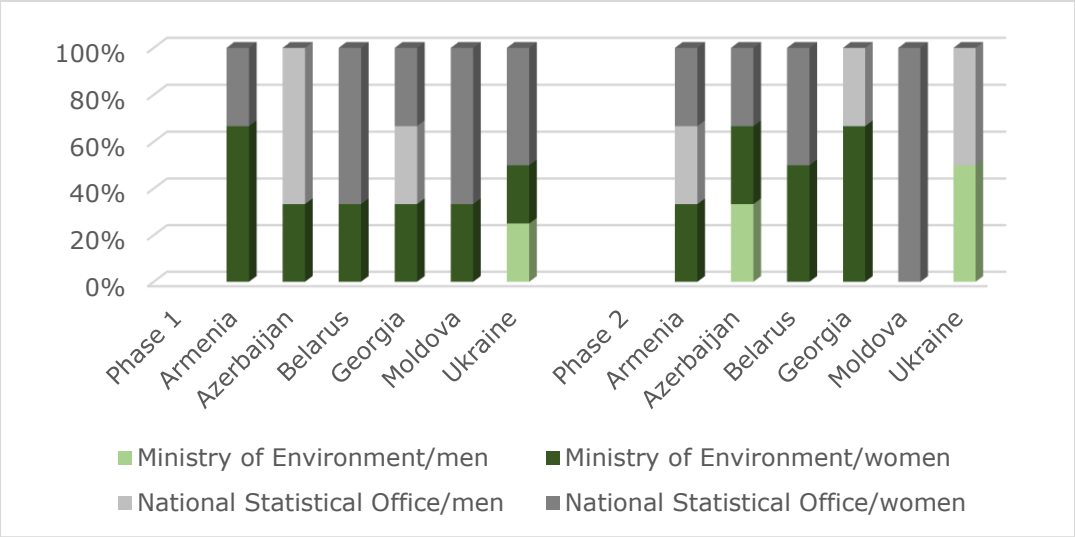
Country	Number of experts responding to Phase 1	Number of experts responding to Phase 2
All countries	15	19
Armenia	3	3
Azerbaijan	3	3
Belarus	2	3
Georgia	3	3
Moldova	2	3
Ukraine	2	4

In Phase 1, on 30 May 2017, 15 persons from six countries were interviewed, five men and 10 women, 80 % of them with more than 10 years' experience working in a relevant field. These interviews targeted the NFPs of the ENI SEIS II East project (12) and three national

[1] https://unstats.un.org/unsd/envaccounting/ceea/meetings/UNCEEA_2_14.pdf

environmental experts. Seven of the respondents were from the countries' ministries of environment and eight were from the national statistical offices. The gender and institutional distribution are presented in Figure 3.1.

Figure 3.1 Number of experts responding to interview by institution and gender



Phase 2 consisted of a follow-up of the EEA survey by interviewing the trainees participating in a session on environmental accounting. The training was organised by the EEA and provided by CIRAD in August 2017 in Montpellier, France. The interviews took place on the last day of training, on 30 August 2017. This involved 19 experts from the six eastern countries. Eight of the experts were from the countries' ministries of environment and eleven were from national statistical offices.

Of the six eastern countries, two countries have started environmental-economic accounting programmes and a further two have environmental-economic accounting programmes planned. The level of implementation of environmental-economic accounting programmes varies between countries, mainly as a result of varying levels of technical assistance provided through organisations such as from EU statistical institutions (bilateral agreements), the Technical Assistance and Information Exchange instrument of the European Commission (TAIEX), the UN Development Account Programme and UNECE.

The study shows that the environmental-economic accounting programmes are included within the national statistical offices and under environmental statistics. When the environmental-economic accounting is included within environmental statistics, it is generally not in a separate unit, as shown in Table 3.2.

Table 3.2 Location of the environmental-economic accounting programme within national statistical offices

	In a separate unit	Not in separate unit	Total
Within national accounts	0	0	0
Within environment statistics	6	6	6

Total	6	6	6

All countries with environmental accounting programmes indicated that these programmes are integrated within the environmental statistics programme and that the same definitions, classifications and data collection methods are used. Two countries (Moldova and Georgia) are in the initial stages of development.

4. Scope of the environmental-economic accounting programmes

A number of questions in the assessment were aimed at identifying the subject areas covered by the environmental-economic accounting programmes, future plans for the programmes and the use of statistics in supporting the compilation process.

Four countries in which the responding institution was involved in environmental accounting were able to provide information on the scope of their programmes and implementation of standardised methodologies to build a new set of indicators.

4.1. Area covered

Table 4.1 presents the modules of environmental-economic accounting compiled by countries.

Table 4.1. Environmental-economic accounts compiled by countries

Module	Number of countries	Year
Total countries	5	
Air emission accounts	Ukraine (annual)	2015
	Moldova (pilot)	2017
Energy accounts	Azerbaijan (annual),	2016
Mineral assets accounts	x	
Land and ecosystem accounts	x	
Water accounts	Armenia (pilot),	2017
	Belarus (pilot)	2017
Material flows accounts/waste accounts	x	
Environmental Protection Expenditure accounts (EPEA)	x	
Forest accounts	x	

The modules most commonly compiled include, in order of importance, energy and emission to the air accounts. The order of importance differs across countries especially with respect to political demand and availability of data. Energy accounts cover two aspects: (1) the physical asset for mineral and energy accounts and (2) the physical supply and use tables for

energy only. The environmental-economic accounting modules that are regularly compiled are produced by national statistical offices in these countries (Azerbaijan and Ukraine).

4.2. Future plans

All the responding institutions compiling environmental-economic accounting are planning to continue the existing programme. In addition, these countries are also planning to expand their programmes in terms of both broadening the coverage and expanding to new areas. As presented in Table 4.2, the subject areas for expansion include, in order of importance: (1) land, (2) air, (3) water, (4) energy, and (5) environmental protection expenditure.

Table 4.2 Areas of further expansion in environmental-economic accounting

Module	Name of countries
Total countries	5
Land and ecosystem accounts	Azerbaijan, Armenia, Belarus, Ukraine, Moldova
Energy and air emission accounts	Armenia, Moldova
Water accounts	Belarus
Environmental protection expenditure accounts (EPEA)	Armenia, Azerbaijan, Ukraine
Material flows accounts/waste accounts	x
Mineral assets accounts	x
Forest accounts	Armenia, Belarus

Countries that are not currently compiling environmental-economic accounts were asked whether they have plans to start compiling any modules of the accounts in the near future. These countries that are without a programme on environmental-economic accounting indicated that they are planning to compile environmental-economic accounts and indicated in which areas. (Table 4.3)

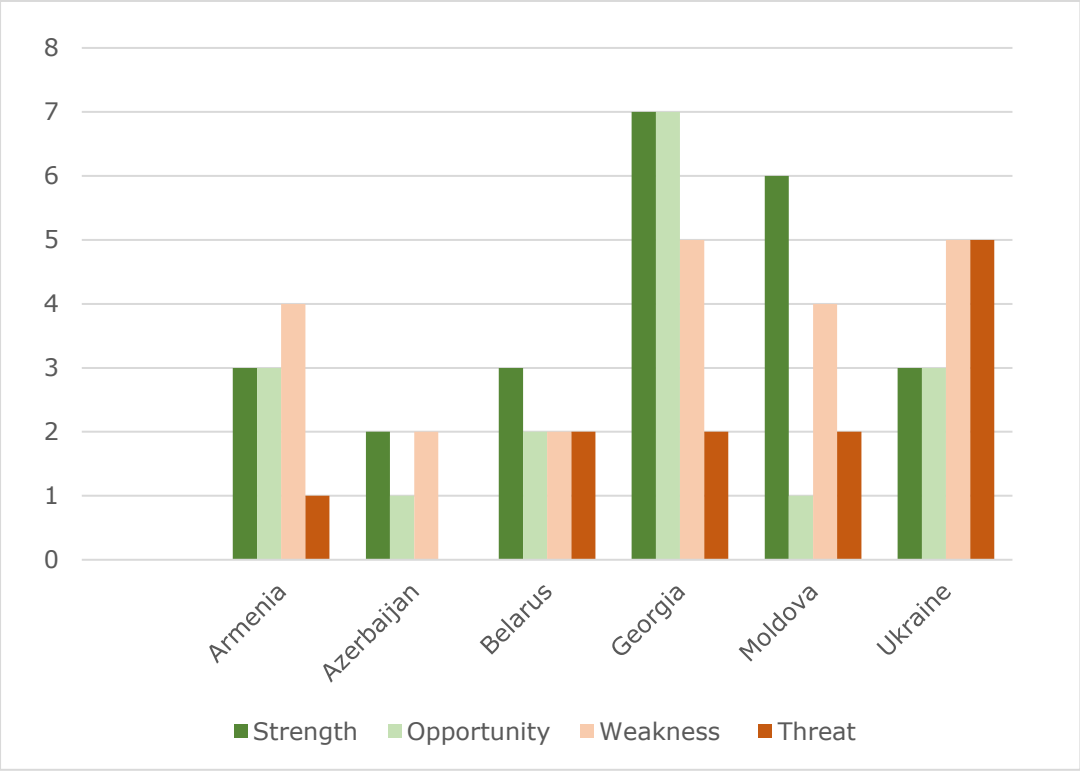
Table 4.3 Plans for compiling environmental-economic accounts in countries with no environmental-economic accounting programme

Module	Number of countries
Total countries	2
Land and ecosystem accounts	Georgia, Moldova
Energy and emission accounts	Georgia, Moldova
Water accounts	Georgia
Environmental protection expenditure accounts (EPEA)	Georgia
Material flows accounts/waste accounts	x
Mineral assets accounts	x
Forest accounts	x

The top four modules identified by countries include, in order of importance: (1) land and ecosystem accounts, (2) environmental protection expenditure accounts, (3) energy and air emission accounts, (4) water accounts (supply-use tables).

On the last day of the vocational training on environmental accounting, the experts were asked to self-assess and score the implementation process of the SEEA in their country under four headings: strengths, weaknesses, opportunities, and threats. A summary of the replies is shown in Figure 4.2. For further details, see the national statements in Annex 2.

Figure 4.2 Assessment of the SEEA implementation process in the six eastern countries, 1 September 2017, score cards



An analysis of the responses of the six eastern countries produced several key points. The SEEA implementation process is carried out by NSOs and is determined by the level of technical assistance available (the UN Development Account programme, UNECE, etc.). Some weakness in the understanding of accounts developers of the ultimate purpose of the products obtained as a result of the SEEA implementation was revealed. The availability of and access to various data sources, modern information technologies and the development of the SEEA methodologies strengthen opportunities for integrating environmental assessments with socio-economic aspects.

4.3. Use and dissemination of the environmental and economic accounts

In the assessment, experts were asked about their countries' use of environmental-economic accounts as well as about their dissemination practices. The most common use was for the derivation of indicators (all of them), followed by modelling and economic analysis (three out of four). The countries that produce accounts indicated that they use environmental statistics in the compilation. The countries compiling accounts indicated that they use them to report to national authorities. The dissemination strategy most widely used was dissemination through statistical publications. The internet was also a widely used vehicle to disseminate the accounts. Three countries indicated that they disseminate the environmental-economic accounting figures within 1 year of the release of the national accounts figures.

5. Impeding factors for the development and compilation of environmental-economic accounting

A number of questions in the assessment asked respondents to identify factors impeding the development and compilation of environmental economic accounts. As shown in Table 5.1, countries identified the lack of human and financial resources, and the lack of national strategy for the SEEA implementation as the most common limiting factors.

Table 5.1 Factors impeding the development of environmental-economic accounting

Impending factors	Number of countries
Total countries	6
Availability of data	4
Quality of data	2
Lack of human resources	6
Lack of financial resources	5
Lack of institutional set-up/coordination	2
Lack of access to training materials	2
Lack of interest of the users	2
Lack of national strategy for the SEEA implementation	6

The top factors impeding the compilation of environmental-economic accounts include the lack of human and financial resources as well as the availability and quality of data (Table 5.2).

Table 5.2 Factors impeding the compilation of environmental-economic accounts

Impending factors	Number of countries
Total countries	5
Availability of data	3
Quality of data	2
Lack of human resources	5
Lack of financial resources	3
Lack of institutional set-up/coordination	2

Lack of access to training materials	1
Lack of interest by the users	1
Lack of national strategy for the SEEA implementation	5

A number of questions in the assessment aimed to identify the use of training material, technical assistance and funding in the compilation of environmental-economic accounts. All countries indicated that they made use of training material, methodological guidelines and/or other countries' expertise. The training material used predominantly included the SNA 2008, Eurostat publications, and UN publications on environmental-economic accounting and on environment statistics[2]. Among the 'other' guidelines that countries mention are those from the Intergovernmental Panel on Climate Change (IPCC), the Food and Agriculture Organization of the United Nations (FAO), the Organisation for Economic Co-operation and Development (OECD) and the EEA.

All six countries have benefited from technical assistance to develop and/or compile environmental-economic accounts. Technical assistance programmes were mainly from international organisations, but were also from other countries. The three countries that are in the process of implementing an accounting programme within their national annual statistical work plans (Azerbaijan, Armenia and Ukraine) are supported by bilateral assistance as well as technical assistance from EU statistical institutions, Eurostat and UNECE.

Table 5.3 shows the use of technical assistance in the compilation of environmental-economic accounts.

Table 5.3 Technical assistance received for the development and compilation of environmental-economic accounts

Sources of assistance	Number of countries
Total beneficiary countries	6
Bilateral agreements with Swedish Statistics	3
Bilateral cooperation with Danida (Denmark)	1
UNECE	6
EU funding/TAIEX	6

Sources of external funding mainly include international/regional organisations, most commonly Eurostat and EU/TAIEX, and UNECE. A few are also supported and funded through direct bilateral cooperation projects (with Denmark and Sweden) or indirectly by country support to UNECE (Norway).

[2] SEEA, 2012; FDES, 2013

6. Examples of environmental-economic accounting programmes

- ✓ Energy accounts. In October 2015, the UNECE, in cooperation with Statistics Norway, conducted a training session in Minsk. The aim of the training session was to assist statistical offices from developing countries in implementing energy accounts. **In Azerbaijan**, since 2016, the NSO, with the participation of experts from energy and environmental statistics and national accountants, has produced two tables of energy accounts that were filled on the basis of the conventional energy balance. The programme started in 2015 and the first publication was in 2016. These accounts of 'production of energy resources' and 'use of energy products' in physical terms (terajoules) were posted on the national website and facilitated the compilation of the UNECE environmental indicator on energy.

- ✓ **In Armenia**, in the context of a 2-year twinning project from 2015 to 2017 with Statistics Denmark, the Department of Social and Environmental Statistics of the Armenian Statistical Service of Republic of Armenia has started the compilation and development of water accounts in Armenia. Basic methodological documents were developed based on the UN SEEA-CF, UN SEEA Water, and Eurostat's Manual for physical water flow accounts. The physical supply and use tables (PSUT) have been compiled and expanded to monetary supply and use tables used in the System of National Accounts (SNA), specifically to accommodate physical flows between the economy and the environment. Three key indicators have been calculated: (1) water consumption, (2) water use, and (3) net emissions. These indicators were combined with monetary information such as gross value added and output production in order to measure water efficiency and water productivity. The final results are published in 2017 and available on the website of the NSOs as a separate section of the SNA satellite accounts.

- ✓ **In Ukraine**, the 2012-2017 national strategy for the development of national statistics includes the SEEA implementation in practice. Since 2015, work on air emission accounts has started and compilation of these accounts is included in the annual work programmes of the NSO. The methodology for compiling air emission accounts is based on the UN SEEA-CF and Eurostat guidance and manuals. The Ministry of Ecology and Natural Resources of Ukraine identified that land accounting is an important tool to support national reporting process to the UNFCCC, especially land use, land use change and forestry (LULUCF).

- ✓ **In Belarus**, the NSO together with the Ministry of Environment and the National Research Centre on integrated use of water resources have started an environmental-

economic accounting programme with particular focus on implementation of the UN SEEA Water in 2016. This pilot is part of the National Statistical Work programme led by the NSO. In 2017 the first PSUTs for water will be produced.

- ✓ From 1999 to 2005, the Ministry of Environment of **Moldova and** the NSO (DASS) carried out a project to develop water accounts and build a national water data centre involving all stakeholders using the French Institute for the Environment (IFEN)/Eurostat cooperation programme. Within this project, water flow accounts/PSUTs for water and physical asset accounts for water resources were compiled for 1994, 1998 and 2000 (Tafi and Weber, 2000; Tafi, 2005).

- ✓ A bilateral technical assistance cooperation agreement between Statistics Sweden and Statistics Moldova and Statistics Georgia is supporting work in **Moldova** on air emission accounts and in **Georgia** on water accounts and air emission accounts.

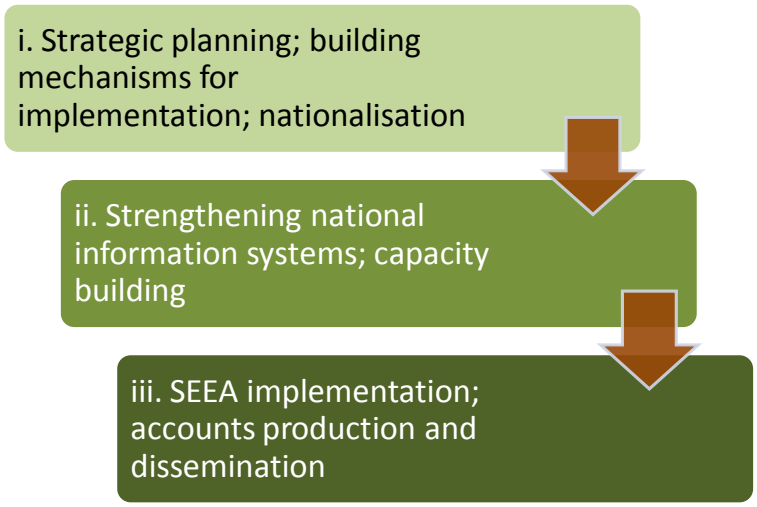
We can see that there is a much closer alignment of subject areas of environmental-economic accounting with environmental statistics programmes than with national accounts even though NSOs play a leading role in development of the accounts.

7. Stages and road map for the development of environmental-economic accounting

Developing and implementing the SEEA consists of multiple steps. Accounting cannot be launched and implemented in just one step, especially in a country that has little experience and that possibly lacks financial and human resources to produce accounts and update them on a regular basis.

Implementing the SEEA can be structured into several stages, as shown in Figure 7.1.

Figure 7.1. Stages in the implementation of the SEEA



7.1. Strategic planning and building a mechanism for the development

The SEEA implementation should start by following the policy interest and priorities and build over time. There are three key steps in the strategic planning laid out here. First, there is a need to **create a 'core group' of producers and stakeholders**; second, **an assessment report** needs to be completed; and third, a national **strategy for environmental accounting** needs to be developed. The European Strategy for Environmental Accounts (ESSC, 2014) is an example of staged implementation.

Coordination of all major stakeholders is required, but the leading steering group or working group should oversee the SEEA development and implementation. The core group on environmental-economic accounting should be established as soon as possible to develop a work plan according to recommendations in the present report. It will lead to the creation of a national report on the overall approach of the SEEA and in particular on priority modules. At the country level, an inter-departmental working group should be established within the SEIS national implementation team to oversee the implementation. The core group on environmental-economic accounting should include representatives from the NSOs and the ministries' of environment as a leading body in developing the SEEA, and possibly other stakeholders from various ministries (Economy and Finance, Agriculture and Forestry, Health, Land planning, etc.) and experts from academia and research.

The strategic planning process will link the public policy framework for the SEEA and financial resources framework. Their integration in the national policies and processes is the main precondition that is necessary to set up and develop nationalisation of environmental accounts. This way, the prioritisation and allocation of the financial resources will ensure the SEEA's integration into the governmental action plan and in institutional planning.

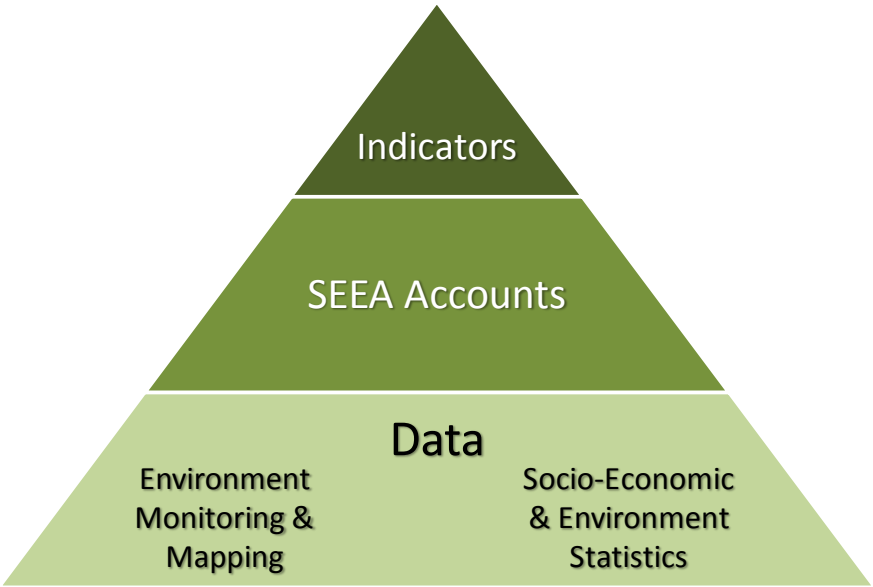
7.2. Strengthening national information systems

The SEEA requires the establishment of an institutional infrastructure based on the multidisciplinary approaches involved. Therefore, policy priorities should be reviewed in the light of building novel data infrastructure.

Collaboration, sharing of information and creation of data flows among different government bodies are necessary. This will require strengthening the capacity for establishing effective data flows and reporting results based on the SEEA concepts. An example of such an aspect is the need for strengthening geographic information system (GIS) expertise in relation to environmental accounting approaches involving land matters, such as ecosystem degradation accounting and ecosystem services assessment (Integrated system for Natural Capital and ecosystem services Accounting (INCA) Knowledge Innovation Programme (KIP) and Mapping and Assessment of Ecosystems and their Services (MAES), UN SEEA-EEA and related UN CBD SEEA-Ecosystem Natural Capital Accounts Quick Start Package (ENCA-QSP)). When the institutions involved in the SEEA implementation activities have insufficient GIS knowledge, appropriate training on GIS tools must be provided.

The development of the SEEA should be complemented by continuous improvements in environmental statistics[3] and environmental monitoring, according to the classical indicator information pyramid (Figure 7.2).

Figure 7.2. The classical indicator information pyramid



[3] UN FDES, 2013

7.3. Capacity building: training on environmental accounting, cycle no 1

The ENI SEIS East II partner countries have identified environmental accounting as highly relevant and requested capacity building in this domain during the first regional project steering committee meeting of November 2016.

The EEA therefore introduced a subcomponent on environmental accounting into the assessment component and developed activities to support it. The first cycle of training on environmental accounting was an introduction to environmental accounting, with a focus on land cover accounts, in order to start the implementation of activities from 2018.
The vocational training on environmental accounting cycle 1 lasted 5 days and addressed 19 experts from six eastern countries. It was built on CIRAD's capacity in this area, taking into consideration the accumulated expertise and its cooperation with the EEA, UN CBD, UNECE and UNEP, including its regional network of national policymakers and experts. The training covered the theoretical and practical aspects of environmental accounting and contextualised them in the overall public policy framework.

The training was based on the SEEA-CF and the SEEA-EEA and its development at the EEA in the context of INCA and MAES, as well as well as the ENCA-QSP practical guidelines developed by UN CBD.

The training focused on land cover accounts and relied in particular on the EEA's 10 years' practical experience in producing and disseminating these accounts (i.e. the land and ecosystem accounting (LEAC) framework, which is the reference used in the ENCA-QSP for land cover accounting). The purpose of the training was to raise awareness of land accounts as the first step in environmental accounting implementation following the EEA methodology. The training presented the latest methodologies, IT applications and hands-on experience that would enable the Eastern Partnership countries to meet their environmental reporting commitments.

Vocational training in Montpellier, France, August 2017

Participants understood the usefulness of and interest in land accounts in connection with statistics and indicators, as well as the "data revolution", development of information technologies and support to environmental policies. This is not a conventional statistics approach based on a traditional survey. It is a novel statistics approach based on GIS and spatial analysis. An introduction to remote sensing and land data was delivered. To demonstrate the process of land accounting with a compilation exercise, a tutorial developed to support the implementation of the UN CBD ENCA-QSP was used. Previously, this tutorial was used in several places, including in a training session that took place during CBD Convention of the Parties (COP) 12 (2014) and a summer school at UQàM (Montreal University) in 2016. This tutorial is based on geographical data and requires working with a GIS, following a step-by-step approach.

Participants were introduced to new methodologies with the objective of showing that land data are accessible, available and ready for use. To demonstrate the capacity of the tools participants were asked, using the GIS tools and data sets, to produce land cover matrices and land accounts. For 18 experts, it was the discovery of how to use the GIS and GIS data for statistical analysis. They were told where to find and how to use land cover data (similar to the Corine Land Cover (CLC) data) to implement the LEAC methodology (EEA experience). All six countries expressed a real interest and may request some additional training on the GIS tools and the CLC programme. This was a very positive experience and the majority of the experts benefited from the training.

CIRAD, Participants of the vocational training in Montpellier, France, August 2017

Training covered the Sustainable Development Goal (SDG) indicators in order to merge the reporting processes of three UN conventions (UN IPCC, UN CBD and UNCCD, and the SDGs; short-term perspectives and longer term expectations) and discussed with participants. The Secretariat of the UN CBD stated that ecosystem accounting is a tool for policy-making and, in the development of which, the UN CBD cooperates with the UNSD and has produced and published (with support from the EEA) methodological guidelines for quick start implementation in support of its own 2012 Aichi Target 2. UNSD recommend using this

guidance as one of the approaches to starting environmental accounting[4]. The conclusions are that the potential is high regarding ecosystem accounts in particular, but they are still under development. Low-hanging products are today material flow accounts (in particular greenhouse gas (GHG) accounts), environmental protection expenditure accounts and land cover accounts.

The conclusions of the training were summarised in a national road map and discussed by the countries (Annex 3).

Generally speaking, the training was evaluated with a good score with high interest in continuing:

- Armenia, Azerbaijan, Georgia, Moldova and Ukraine are interested in implementing environmental accounting and would like to start with land accounts. In order to facilitate the LEAC methodology implementation there was an explicit request for CLC data and CLC training for these countries.
- Belarus expressed an interest in the SEEA-CF implementation of water accounts and forest accounts.

The implementation proposal is to follow a tiered approach and share activities, which will allow the progressive implementation of environmental accounts with intermediate milestones and products of interest wrapped into the road map.

The ENI SEIS II East project and UNECE Statistics agreed that UNECE Statistics will cover activities for the development of the SEEA-CF and the EEA for the SEEA based on an integrated spatial approach, i.e. ecosystems.

In October 2017, UNECE and UNSD, with the support of Statistics Netherlands, will launch a training programme on the SEEA-CF. The training programme is based on a blended learning format consisting of the following three phases:

1. An online course to provide an overview of the SEEA-CF and to cover topics such as physical flow accounts, environmental asset accounts and environmental activity accounts.
2. On-site training for participants from countries that have demonstrated a strong commitment to implementation of the SEEA-CF, to further enhance their knowledge of the SEEA-CF.
3. Follow-up actions such as conducting a national training workshop on the SEEA-CF and creating a national strategy and work plan for the implementation of the SEEA-CF.

The ENI SEIS II East project together with the EEA will continue to extend the vocational training sessions similar to the first cycle. The second and third cycles of vocational training could cover carbon and water modules in 2018/2019. In 2019/2020 a fourth and fifth cycle of vocational training could cover biodiversity and integrated assessment modules. This is subject to finding the right institutional arrangement to allow the use of the EU's and the EEA's ETC/Eionet services in 2018-2020 under ENI cooperation.

[4] Page 160, SEEA Experimental Ecosystem Accounting, Technical Recommendations draft, March 2017, UNSD

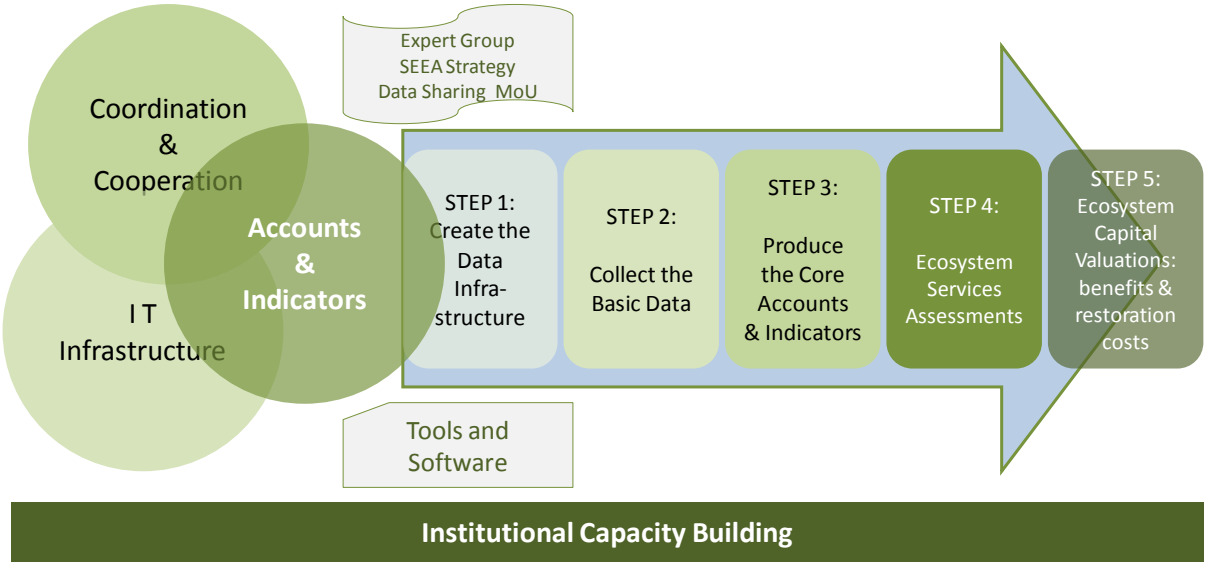
7.4. Producing and disseminating results

The SEEA should support national policies to improve the monitoring of consumption and preservation of natural capital in a country. Priority accounts and possible phases of their development are discussed in Chapters 4 and 7 of this report. Priorities can change with a changing policy environment.

The road map below depicts steps of a workflow that could be launched successively with the outlook of implementing the SEEA as requested by international policies. It includes the requirement of the UN CBD Strategy of Aichi to incorporate biodiversity values into national accounts by 2020, the UNCCD target of 'land degradation neutral development', the targets of the UNFCCC related to carbon sequestration and adaptation to global warming and more generally to the SDGs, from which these objectives have been taken, all together with several other targets on which environmental-economic accounts can have a useful impact. This will fulfil the targets of making biodiversity and ecosystems components of national accounting. The outlook is that of creating or reinforcing perennial information systems in order to support sustainable development policies with regard to the environment. After the accounts are compiled, key findings and indicators should be communicated not only within the government agencies, but also to the general public and the international community.

The simplified road map for the SEEA implementation describes workflow steps as shown in Figure 7.3 and with further details in Table 7.1.

Figure 7.3 A road map and workflow steps to implement the SEEA within the SEIS principles



Notes: MoU, memorandum of understanding.

The building and implementation of the SEEA should be based on a modular approach, starting with basic layers and pilot accounts, and continually building towards the relatively coherent structure of the SEEA, including the ecosystem accounting approach based on a spatial platform.

Table 7.1 Steps for the SEEA implementation for integrated assessment approach

Objective	***Data sets/accounts***	***Tasks to the accountant***
Step 1: Create the data infrastructure needed for accounting		
Collect reference geographical data sets and create the database needed for environmental accounting	Geographical features/zonings • Physical boundaries (coastline, river basins and sub-basin limits, climate zoning, elevation classes) • Administrative boundaries (municipalities, districts, regions) • Transport network • Hydrological network, rivers, aquifers • Sea/fisheries zoning(s) Regular grid(s) for accounting (1 ha and 1 km^2)	*Collect the basic geographical layers that will structure the physical accounts from relevant organisations. Check their consistency (geometry, projection). Produce a set of regular grids (based on official geographical standards). Create the database needed for environmental accounting: for terrestrial ecosystems, rivers, marine coastal units and other sea accounting units* *(NB: requires land cover map for the baseline year)*
Step 2: Collect the basic data sets		
Collect the basic data sets for environmental accounting: monitoring data and statistics	• Land cover change (including marine coastal areas) • Meteorological data • Hydrological data • Soil data • Data on forest stocks and growth • Population data • Regular agriculture, forestry and fishery statistics • Data/statistics on water use • Indicators on species and systems biodiversity • Energy balances • Environment protection expenditures statistics	*Produce a consistent multi-annual (10- to 20-year period) land cover map/database using satellite images and other sources available (forest maps, cadastre, buildings and roads, etc.).* *Collect and organise the various sets of data and statistics needed for accounting. Official data sources are given priority: official statistics, meteorological data, hydrological data, etc., where available, accounts produced for IPCC reporting, REDD+, SEEA-water, etc., are important inputs. Satellite data sometimes as second best.*
Step 3: Produce the core accounts		
Produce the core environmental accounts	• Land cover change account • Carbon account • Air emission accounts • Water account • Biodiversity account • Energy account • Environmental protection expenditures account • Accounts integration, assessment of ecosystem degradation	*Compile the accounts with basic data collected at step 2, additional data for specific items and physical data modelling. Geo-process data sets. Estimate of missing data. Integrate the accounts and assess ecosystem degradation and other sustainability issues.*
Step 4: Ecosystem services assessments		
Ecosystem services assessments in physical units	• Social demand for ecosystem services (by ecosystem units, municipalities, regions, etc.)	*Targeted, detailed mapping and analysis to be carried out with statistical offices, planning agencies, environment agencies, research sector, etc., of ecosystem services of particular importance and their social use.* *Assessment of ecosystem services sustainability.*
Step 5: Ecosystem capital valuations		
Ecosystem capital valuations: benefits and restoration costs in monetary units	• Valuation of selected ecosystem services • Assessment of unpaid ecosystem restoration costs • Accountability of economic sectors to capital degradation/enhancement • Degradation embedded in trade	*Economic analysis of ecosystem services in monetary value.* *Economic analysis of remediation costs (restoration works, alleviation, opportunity costs of reducing pressure on the environment, etc.).* *Assessment of ecosystem degradation embedded in international trade*

Source: Weber (2014).

Notes: REDD+, Reducing Emissions from Deforestation and Forest Degradation.

Table 7.1 gives an overview of objectives, accounts and tasks to prioritise during the development of the SEEA and the ecosystem accounting approach, in blocks focused on land and ecosystem accounting, carbon and forest ecosystem accounting, and ecosystem water accounting. These are complementary modules, which can also stimulate data organisation and flows. There is no need to fully develop all of these accounts, but without at least partial accounting for these components of natural wealth, the picture would be quite incomplete.

The SEEA development should follow a tiered approach that will allow the progressive implementation of environmental accounts with intermediate milestones and products of interest. Once the basic accounting infrastructure is in place, a streamlined development will be possible, considering the overall improvement of the first accounts and the development of priority modules well positioned in the accounting framework. Their operationalisation will require further development in terms of data improvement, capacity building and institutional cooperation necessary for future annual updates.

Conclusion

Although at an early stage, implementation of environmental-economic accounting has started in five of the six eastern countries, and all six have expressed interest in implementing it. It appears that the SEEA-CF is the responsibility of NSOs. This is probably the result of the SEEA-CF implementation plan decided by the UN Statistical Commission and the demand for regional commissions to advance the implementation in their respective countries. In Europe, outside the Eurostat area, this task is carried out by UNECE, with which a partnership has been set up for the ENI SEIS II East project, including appropriate financial support to actions decided in common.

Ecosystem natural capital accounts are of more interest for ministries of environment and agencies and could be implemented in cooperation with NSOs, which ENI could promote. One way forward is to repeat training sessions on advanced ecosystem accounting methodologies with participation of staff of both NSOs and ministries of environment of each country. This is subject to finding the right institutional arrangement to allow the use of the EU's and the EEA's ETC/Eionet services in 2018-2020 under ENI cooperation.

It is important to make a decision on the way forward as outlined in the assessment to advance the implementation of ENI SEIS II East project component 3 on environmental accounting.

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Annex 1. The assessment survey

The assessment was carried out via interviews with representatives from the ministries of environment and the NSOs of the six eastern countries.

The first interviews took place during the regional meeting of the NFPs of the ENI SIES 2 East project on 30 May 2017. The responding called A.

The second interviews took place during the regional training session on environmental accounting on 30 August 2017. The responding called B.

The assessment could be filled in on paper, electronically via email or online. See the questionnaire below.

Part 1

Self assessment tool of the System Environmental-Economic Accounting progress		
Please provide your contact information:		
Country:		
Name of institution:		
Contact person:		
Email:		
Tel:		
Questionnaire **On Assessment of progress in SEEA implementation in the ENI East countries**		
Dear participant,		
As you know, the objective of the Assessment of progress in SEEA implementation in the ENI East countries workshop is to discuss the different models applied across countries and region to implement SEEA and identify the success factors for incorporating SEEA into policy decision making processes. In order to facilitate experience sharing on progress to date, we propose you a set of structuring questions.		
We present them in 3 parts related to our 3 discussion topics regarding SEEA: to assess the progress in SEEA implementation in the six countries of the ENI East region and to build a road map of the project activities alongside. We propose you, on the one hand (part 1), to describe the current status of work in your country/organization; and, on the other hand, to propose identify obstacles and further recommendations that would be useful to strengthen SEEA in your country/ organization. On another hand (part 2), for those who plans to start activates in SEEA implementation, you will identify an account according the policy demand, avalibility of capacity and usability. And in Part 3 we propose you to describe the availabilty of political documents and strategies which will support the SEEA implemenation and progress.		
For any information, please contact Ms. Jana Tafi		
E-mail: jana.tafi@eea.europa.eu / skype: jana.tafi		
Thank you for your participation in selfassesssment of progress in SEEA impelemation in your country!		
Please indicate if:		
I give permission for my country's responses to be published	yes	no
or My country's responses must be kept confidential	yes	no

1	Does your Institution/Agency have a Programme on Environmental-Economic Accounting? In case of reply: "YES" answer the Question 2 through 17 In case" NO" go to the Question 16 through 23	Yes	No	Please, your reply introduce with "X"

2	Which modules of SEEA are compiled in your country, and by which ministry/institution/agency	Please introduce with "X"	Please introduce years	Which minsitry/institution/agency
	SEEA Central Framework			
	Natural resource accounts			
	2.1. Land cover accounts			
	2.1.1. Physical asset accounts for land (land cover and/or land use)			
	2.1.2. Monetary asset accounts for land (land cover and/or land use)			
	2.2. Forest accounts			
	2.2.1. Physical asset accounts for timber resources			
	2.2.2. Monetary asset accounts for timber resources			
	2.3. Water stock accounts			
	2.3.1. Physical asset accounts for water resources			
	2.4. Mineral and energy asset accounts			
	2.4.1. Physical asset accounts for mineral and energy resources*			
	2.4.2. Monetary asset accounts for mineral and energy resources*			
	2.5. Fisheries accounts			
	2.5.1. Physical asset accounts for aquatic resources			
	2.5.2. Monetary asset accounts for aquatic resources			
	2.6. Asset accounts for other biological resources			
	Physical and hybrid flow accounts			
	2.7. Air emission accounts			
	2.8. Water emission accounts			
	2.9. Water flow accounts			
	2.9.1. Physical supply and use tables for water			
	2.9.2. Monetary supply and use tables for water			
	2.10. Energy and material flow accounts			
	2.10.1. Physical supply and use tables for energy			
	2.10.2. Monetary supply and use tables for energy			
	2.10.3. Full set of supply and use tables for materials			
	2.10.4. Economy-wide material flow accounts (MFA)			
	2.11. Waste accounts			
	Environmental activity accounts			
	2.12. Environmental protection expenditure accounts (EPEA)			
	2.13. Resource use and management accounts (RUMEA)			
	2.14. Environmental subsidies account			
	2.15. Environmental taxes account			
	2.16. Environmental goods and services sector accounts (EGSS)			
	SEEA Experimental Ecosystem Accounts			
	2.17. Accounts for land			
	2.18. Accounts for carbon related stocks and flows			
	2.19. Accounts for biodiversity			
	2.20. Accounts for water related stocks and flows			
	2.21. Ecosystem extent accounts			
	2.22. Ecosystem condition accounts			
	2.23. Ecosystem services supply and use accounts (physical)			
	2.24. Ecosystem services supply and use accounts (monetary)			
	2.25. Ecosystem monetary asset accounts			
	2.26. Integrated accounts (i.e. integrating ecosystem accounting information with standard national accounts)			
	2.27. Others, please specify			

3	Total number of staff working in the compilation of these accounts (in full time equivalent)	Please introduce number
	3.1. In your institution	
	3.1.1. Number of professional staff	
	3.1.2. Number of support staff	
	3.2. In other institutions: specify	
	3.2.1. Number of professional staff	
	3.2.2. Number of support staff	

4	Where is the Environmental-Economic Accounting Programme located within your ministry/institution/agency? Please select one	In a separate unit	Not in separate unit	Please, your reply introduce with "X"
	4.1. Within national accounts			
	4.2. Within environment statistics			
	4.2. Within other			

5	Is the Environment Statistics Programme integrated with the Environmental-Economic Accounting Programme?	Yes	No	Please, your reply introduce with "X"
	5.1.			
6	Does your Institution/Agency cooperate with other Institutions/Agencies in the area of Environmental-Economic Accounts?	Yes	No	Please, your reply introduce with "X"
	6.1.			
	6.1.1. if yes, please explain			
7	If you answered yes to question 6, what is the leading agency in Environmental-Economic Accounting?	Yes	No	Please, your reply introduce with "X"
	7.1.			
8	In compiling Environmental-Economic Accounts, has your Institution/Agency made use of the following:	Yes	No	Please, your reply introduce with "X"
	8.1.Training material, methodological guidelines or country experiences?			
	8.1.1. please specify: SNA			
	8.1.2. please specify: SEEA-CF			
	8.1.3. please specify: SEEA EEA			
	8.1.4. please specify: EUROSTAT			
	8.1.4. please specify: others			
	8.2. Technical assistance from international organisations or countries?			
	8.2.1. please describe during which period			
	8.2.2. please describe during which nature of assistance			
	8.2.3. please mention donor(s) and which organisations or experts have delivered the assistance			
	8.3. External funding			
	8.3.1. please describe during which period			
	8.3.2. please describe from which sources			
	8.3.3. please mention donor(s) and which organisations or experts have delivered the assistance			

9	Which of the following accounts are regularly produced, also in upcoming years in your institution/agency/country?	Yes	No	Which minsitry/institution/agency	Please, your reply introduce with "X"
	SEEA Central Framework				
	Natural resource accounts				
	9.1. Land cover accounts				
	9.1.1. Physical asset accounts for land (land cover and/or land use)				
	9.1.2. Monetary asset accounts for land (land cover and/or land use)				
	9.2. Forest accounts				
	9.2.1. Physical asset accounts for timber resources				
	9.2.2. Monetary asset accounts for timber resources				
	9.3. Water stock accounts				
	9.3.1. Physical asset accounts for water resources				
	9.4. Mineral and energy asset accounts				
	9.4.1. Physical asset accounts for mineral and energy resources*				
	9.4.2. Monetary asset accounts for mineral and energy resources*				
	9.5. Fisheries accounts				
	9.5.1. Physical asset accounts for aquatic resources				
	9.5.2. Monetary asset accounts for aquatic resources				
	9.6. Asset accounts for other biological resources				
	Physical and hybrid flow accounts				
	9.7. Air emission accounts				
	9.8. Water emission accounts				
	9.9. Water flow accounts				
	9.9.1. Physical supply and use tables for water				
	9.9.2. Monetary supply and use tables for water				
	9.10. Energy and material flow accounts				
	9.10.1. Physical supply and use tables for energy				
	9.10.2. Monetary supply and use tables for energy				
	9.10.3. Full set of supply and use tables for materials				
	9.10.4. Economy-wide material flow accounts (MFA)				
	9.11. Waste accounts				
	Environmental activity accounts				
	9.12. Environmental protection expenditure accounts (EPEA)				
	9.13. Resource use and management accounts (RUMEA)				
	9.14. Environmental subsidies account				
	9.15. Environmental taxes account				
	9.16. Environmental goods and services sector accounts (EGSS)				
	SEEA Experimental Ecosystem Accounts				
	9.17. Accounts for land				
	9.18. Accounts for carbon related stocks and flows				
	9.19. Accounts for biodiversity				
	9.20. Accounts for water related stocks and flows				
	9.21. Ecosystem extent accounts				
	9.22. Ecosystem condition accounts				
	9.23. Ecosystem services supply and use accounts (physical)				
	9.24. Ecosystem services supply and use accounts (monetary)				
	9.25. Ecosystem monetary asset accounts				
	9.26. Integrated accounts (i.e. integrating ecosystem accounting information with standard national accounts)				
	9.27. Others, please specify				

10	Are there plans to expand the compilation of the Environmental-Economic Accounts at your Institution/Agency/Country?	Yes	No	Which minsitry/institution/agency	Please, your reply introduce with "X"
	SEEA Central Framework				
	Natural resource accounts				
	10.1. Land cover accounts				
	10.1.1. Physical asset accounts for land (land cover and/or land use)				
	10.1.2. Monetary asset accounts for land (land cover and/or land use)				
	10.2. Forest accounts				
	10.2.1. Physical asset accounts for timber resources				
	10.2.2. Monetary asset accounts for timber resources				
	10.3. Water stock accounts				
	10.3.1. Physical asset accounts for water resources				
	10.4. Mineral and energy asset accounts				
	10.4.1. Physical asset accounts for mineral and energy resources*				
	10.4.2. Monetary asset accounts for mineral and energy resources*				
	10.5. Fisheries accounts				
	10.5.1. Physical asset accounts for aquatic resources				
	10.5.2. Monetary asset accounts for aquatic resources				
	10.6. Asset accounts for other biological resources				
	Physical and hybrid flow accounts				
	10.7. Air emission accounts				
	10.8. Water emission accounts				
	10.9. Water flow accounts				
	10.9.1. Physical supply and use tables for water				
	10.9.2. Monetary supply and use tables for water				
	10.10. Energy and material flow accounts				
	10.10.1. Physical supply and use tables for energy				
	10.10.2. Monetary supply and use tables for energy				
	10.10.3. Full set of supply and use tables for materials				
	10.10.4. Economy-wide material flow accounts (MFA)				
	10.11. Waste accounts				
	Environmental activity accounts				
	10.12. Environmental protection expenditure accounts (EPEA)				
	10.13. Resource use and management accounts (RUMEA)				
	10.14. Environmental subsidies account				
	10.15. Environmental taxes account				
	10.16. Environmental goods and services sector accounts (EGSS)				
	SEEA Experimental Ecosystem Accounts				
	10.17. Accounts for land				
	10.18. Accounts for carbon related stocks and flows				
	10.19. Accounts for biodiversity				
	10.20. Accounts for water related stocks and flows				
	10.21. Ecosystem extent accounts				
	10.22. Ecosystem condition accounts				
	10.23. Ecosystem services supply and use accounts (physical)				
	10.24. Ecosystem services supply and use accounts (monetary)				
	10.25. Ecosystem monetary asset accounts				
	10.26. Integrated accounts (i.e. integrating ecosystem accounting information with standard national accounts)				
	10.27. Others, please specify				

11	What have been the major constraints in developing the Environmental-Economic Accounting Programme?			Please, your reply introduce with "X"
	11.1. Lack of institutional set-up/coordination			
	11.2. Lack of financial resources			
	11.3. Lack of human resources			
	11.4. Lack of interest by the users			
	11.5. Lack of access to training materials			
	11.6. Availability of data			
	11.7. Quality of data			
	11.8. Others			
12	What are the major constraints in compiling the Environmental-Economic Accounts?			Please, your reply introduce with "X"
	12.1. Lack of institutional set-up/coordination			
	12.2. Lack of financial resources			
	12.3. Lack of human resources			
	12.4. Lack of interest by the users			
	12.5. Lack of access to training materials			
	12.6. Availability of data			
	12.7. Quality of data			
	12.8. Others			
13	How are the Environmental-Economic Accounts disseminated?			Please, your reply introduce with "X"
	13.1. Statistical publications			
	13.2. Environmental publications			
	13.3. Internet			
	13.4. Others			
14	At what time lag are the Environmental-Economic Accounts figures disseminated as compared to National Accounts figures?			Please, your reply introduce with "number of days"
	14.1. Specify			
15	Are Environmental-Economic Accounts transmitted/reported to international/regional organisations?	Yes	No	Please, your reply introduce with "X"
	15.1. if yes, specify to which international/regional organisations...			
	15.1.1.			
	15.1.2.			

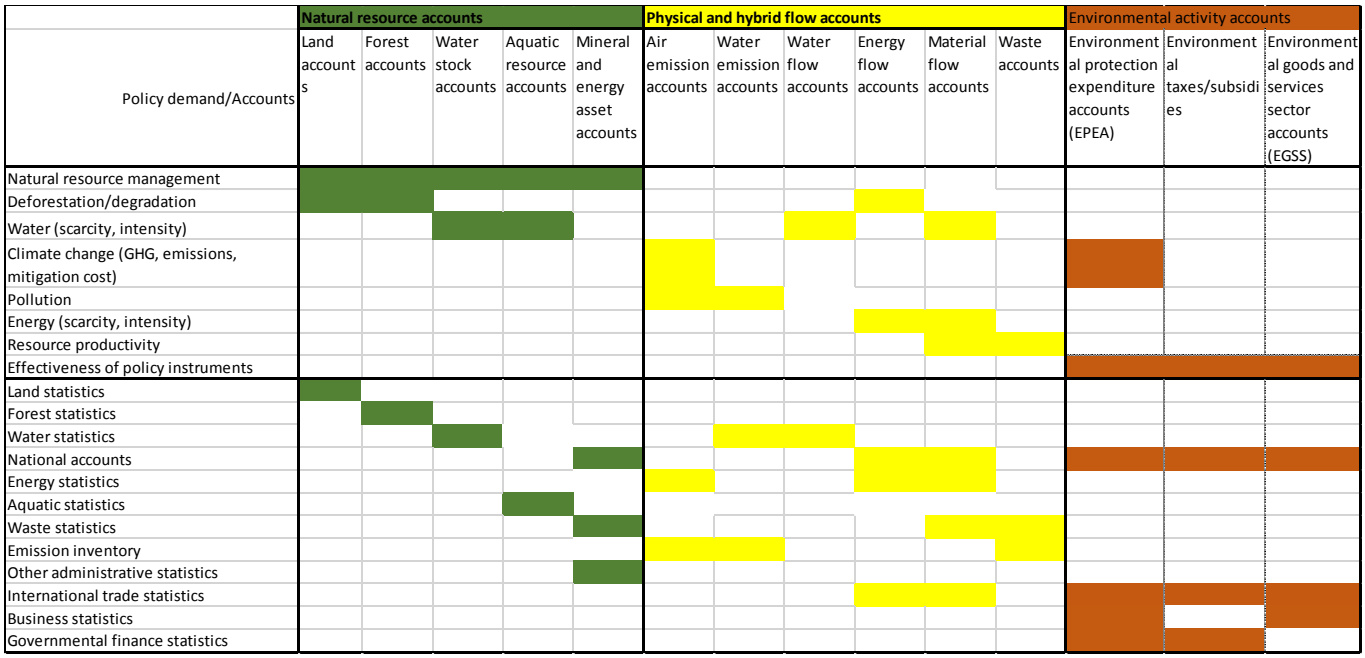
16	In your country, are the Environmental-Economic Accounts used for:	Yes	No	Please, your reply introduce with "X"
	16.1. Deriving indicators			
	16.2. Modelling, economic analysis			
	16.3. Environmental assessments			
	16.4. Other			
17	Do other institutions/agencies compile any part of the Environmental-Economic acccounts in your country?	Yes	No	Please, your reply introduce with "X"
	17. if yes, specify:			
	17.1. Name of institution			
	17.2. Type of accounts			
18	Are supply and use tables and/or input-output tables compiled in your country?	Yes	No	Please, your reply introduce with "X"
	18.1.			
19	Have any modules of the Environmental-Economic Accounts been compiled in the past in your country?	Yes	No	Please, your reply introduce with "X"
	19. if yes, specify:			
	19.1. Type of accounts			
	19.2. For which year			
	19.3. Agency responsible			
	19.4. Type of funding:			
	19.4.1. external funding			
	19.4.2. internal funding			
20	What were the reasons for not continuing with the compilation of Environmental-Economic Accounts?			Please, your reply introduce with "X"
	20.1. Lack of institutional set-up/coordination			
	20.2. Lack of financial resources			
	20.3. Lack of human resources			
	20.4. Lack of interest by the users			
	20.5. Lack of access to training materials			
	20.6. Availability of data			
	20.7. Quality of data			
	20.8. Others			

21	Are there plans to compile any modules of the Environmental-Economic Accounts in your country in the near future?	Yes	No	Please, your reply introduce with "X"
	SEEA Central Framework			
	Natural resource accounts			
	21.1. Land cover accounts			
	21.1.1. Physical asset accounts for land (land cover and/or land use)			
	21.1.2. Monetary asset accounts for land (land cover and/or land use)			
	21.2. Forest accounts			
	21.2.1. Physical asset accounts for timber resources			
	21.2.2. Monetary asset accounts for timber resources			
	21.3. Water stock accounts			
	21.3.1. Physical asset accounts for water resources			
	21.4. Mineral and energy asset accounts			
	21.4.1. Physical asset accounts for mineral and energy resources*			
	21.4.2. Monetary asset accounts for mineral and energy resources*			
	21.5. Fisheries accounts			
	21.5.1. Physical asset accounts for aquatic resources			
	21.5.2. Monetary asset accounts for aquatic resources			
	21.6. Asset accounts for other biological resources			
	Physical and hybrid flow accounts			
	21.7. Air emission accounts			
	21.8. Water emission accounts			
	21.9. Water flow accounts			
	21.9.1. Physical supply and use tables for water			
	21.9.2. Monetary supply and use tables for water			
	21.10. Energy and material flow accounts			
	21.10.1. Physical supply and use tables for energy			
	21.10.2. Monetary supply and use tables for energy			
	21.10.3. Full set of supply and use tables for materials			
	21.10.4. Economy-wide material flow accounts (MFA)			
	21.11. Waste accounts			
	Environmental activity accounts			
	21.12. Environmental protection expenditure accounts (EPEA)			
	21.13. Resource use and management accounts (RUMEA)			
	21.14. Environmental subsidies account			
	21.15. Environmental taxes account			
	21.16. Environmental goods and services sector accounts (EGSS)			
	SEEA Experimental Ecosystem Accounts			
	21.17. Accounts for land			
	21.18. Accounts for carbon related stocks and flows			
	21.19. Accounts for biodiversity			
	21.20. Accounts for water related stocks and flows			
	21.21. Ecosystem extent accounts			
	21.22. Ecosystem condition accounts			
	21.23. Ecosystem services supply and use accounts (physical)			
	21.24. Ecosystem services supply and use accounts (monetary)			
	21.25. Ecosystem monetary asset accounts			
	21.26. Integrated accounts (i.e. integrating ecosystem accounting information with standard national accounts)			
	21.27. Others, please specify			

22	As the Global strategy has targets for the year 2020, which of the following accounts will be part of regular statistical production?	By 2020	Later	Please, your reply introduce with "X"
	SEEA Central Framework			
	Natural resource accounts			
	22.1. Land cover accounts			
	22.1.1. Physical asset accounts for land (land cover and/or land use)			
	22.1.2. Monetary asset accounts for land (land cover and/or land use)			
	22.2. Forest accounts			
	22.2.1. Physical asset accounts for timber resources			
	22.2.2. Monetary asset accounts for timber resources			
	22.3. Water stock accounts			
	22.3.1. Physical asset accounts for water resources			
	22.4. Mineral and energy asset accounts			
	22.4.1. Physical asset accounts for mineral and energy resources*			
	22.4.2. Monetary asset accounts for mineral and energy resources*			
	22.5. Fisheries accounts			
	22.5.1. Physical asset accounts for aquatic resources			
	22.5.2. Monetary asset accounts for aquatic resources			
	22.6. Asset accounts for other biological resources			
	Physical and hybrid flow accounts			
	22.7. Air emission accounts			
	22.8. Water emission accounts			
	22.9. Water flow accounts			
	22.9.1. Physical supply and use tables for water			
	22.9.2. Monetary supply and use tables for water			
	22.10. Energy and material flow accounts			
	22.10.1. Physical supply and use tables for energy			
	22.10.2. Monetary supply and use tables for energy			
	22.10.3. Full set of supply and use tables for materials			
	22.10.4. Economy-wide material flow accounts (MFA)			
	22.11. Waste accounts			
	Environmental activity accounts			
	22.12. Environmental protection expenditure accounts (EPEA)			
	22.13. Resource use and management accounts (RUMEA)			
	22.14. Environmental subsidies account			
	22.15. Environmental taxes account			
	22.16. Environmental goods and services sector accounts (EGSS)			
	SEEA Experimental Ecosystem Accounts			
	22.17. Accounts for land			
	22.18. Accounts for carbon-related stocks and flows			
	22.19. Accounts for biodiversity			
	22.20. Accounts for water related stocks and flows			
	22.21. Ecosystem extent accounts			
	22.22. Ecosystem condition accounts			
	22.23. Ecosystem services supply and use accounts (physical)			
	22.24. Ecosystem services supply and use accounts (monetary)			
	22.25. Ecosystem monetary asset accounts			
	22.26. Integrated accounts (i.e. integrating ecosystem accounting information with standard national accounts)			
	22.27. Others, please specify			

23	What seem to be the major constraints in the compilation of Environmental-Economic Accounts in you country?			Please, your reply introduce with "X"
	23			
	23.1. Lack of institutional set-up/coordination			
	23.2. Lack of financial resources			
	23.3. Lack of human resources			
	23.4. Lack of interest by the users			
	23.5. Lack of access to training materials			
	23.6. Avialabilityt of data			
	23.7. Quality of data			
	23.8. Others			
24	Are you aware of any technical assistance programme from international organisations, NGOs or other institutions for the implementation of Environmental-Economic Accounts in your country?	Yes	No	Please, your reply introduce with "X"
	24			

Part 2



Key policy issues are shown which
form the main elements of these policy frameworks. For instance, assessments of the natural capital base (and its depletion) are important to sustainable development, while resource productivity is a key element of green growth. Other examples are policy issues such as pollution, climate change, water scarcity, etc.

A list of the various types of environmental accounts (i.e
modules) as described in SEEA-Central Framework and indicates through the connecting arrows which accounts can be used to address the various types of policy issues. Not shown in this figure are the overarching policy frameworks, which are usually connected to the objectives of environmental accounting, namely sustainable development and green economy /green growth. The measurement framework needed for these two general policy issues are often assessed through selected indicator sets, that can in part be derived from the SEEA-CF

Main data sources that are commonly required to compile
specific types of environmental accounts. There may be differences between countries in terms of the specific data sources used, but the diagram is meant to provide a general overview of basic data requirement.

Data quality assessments that can be done on these required
data sources. The data quality assessment framework (DQAF) covers five dimensions of quality (integrity, methodological soundness, accuracy and reliability, serviceability and accessibility) and a set of prerequisites for the assessment of data quality. The coverage of these dimensions recognizes that data quality encompasses characteristics related to the institution or system behind the production of the data as well as characteristics of the individual data product.

Part 3

1	Is there a sustainable development strategy in your country?	Yes	No
	1.1. 1.2. if yes, what is the ministry in charge?		

2	Is there a green economy or green growth strategy in your country?	Yes	No
	2.1. 2.2. if yes, what is the ministry in charge?		

3	Is there a national strategy on SEEA implementation in your country?	Yes	No
	3.1. 3.2. if yes, what is the ministry/institution/agency in charge?		

4	In your country, are there projects or research on the valuation of ecosystem services ?	Yes	No
	4.1. 4.2. if yes, what is the ministry/institution/agency in charge?		

5	Is your country participating in a project under the WAVES partnership set up by the World Bank for natural capital accounting and total wealth assessment?	Yes	No
	5.1. 5.2. if yes, what is the ministry/institution/agency in charge?		

Notes: WAVES, Wealth Accounting and the Valuation of Ecosystem Services.

Annex 2. SWOT analysis by country

Armenia

Strengths: Environmental reporting system Compiled water accounts and first steps taken to compiling air emission accounts Wide availability of administrative data and richness of the statistical database in line with main water accounts and water accounting requirements	**Weaknesses:** Methodological improvement needed Lack of institutional set up and coordination Lack of financial and human resources Lack of experience Need for assessment to understand what we have and where we are going
Opportunities: Promote the use of environmental accounting as a key element of environmental assessment and policy support Provide updates on a regular basis To produce reliable, consistent, timely, comparable and accessible data	**Threats**: Internal and external political changes

Azerbaijan

Strengths: Creation of working group Cooperation between institutions	**Weaknesses:** Not enough experience Incomplete methodology requires urgent attention
Opportunities: Availability of methodology	**Threats:**

Belarus

Strengths: Development strategy on information Inter-departmental cooperation on data availability	**Weaknesses:** Lack of human resources Lack of methodological knowledge
Opportunities: Data integration New topical/thematic indicators	**Threats:** Restructuring of state bodies Economic crisis

Georgia

Strengths: National policies and strategies Implementation and reporting to Rio Convention process	**Weaknesses:** Lack of experience Gaps in legislation

Nationalised SDGs Sectoral data and IT infrastructure Synergy of projects on the SEEA Institutional coordination Interest and willingness	Lack of full understanding of the systemic approach Lack of human resources Lack of available data Lack of financial resources
Opportunities: Integrating environmental aspects into national accounts Support for ecosystem services development Managing natural resources with its economic values Full compliance with international processes Sustainable management of natural resources Enhanced policy planning, implementation and monitoring of natural resource strategies Full understanding of natural capital value Support for sustainable development and green growth	**Threats:** Political changes Resource mobilisation and coordination

Moldova

Strengths: Existing legal and normative framework Signature of Association Agreement with the EU Existing strategy of development of National Statistics System 2016-2020 Inter-ministerial cooperation Bilateral and multilateral agreement between the statistical office and other institutions Available data and statistical products	**Weaknesses:** Unstable political situation Lack of financial resources Lack of experience Economic crisis Undocumented processes
Opportunities: External assistance — training and projects	**Threats:** Fluctuations in availability of human resources

Ukraine

Strengths: Scientific technical potential Good cooperation with neighbouring countries (Belarus–Moldova), CLC pilot	**Weaknesses:** Institutional responsibilities Lack of institutional coordination. Lack of human resources Legislation

Strong interest in studying environmental accounting and its development in the country	Weak institutional cooperation Lack of experience and knowledge
Opportunities: Environmental accounting provides a good opportunity for making environmental policies Possibility to connect accounts with policy and economic activities Creation of mutual regional systems	**Threats:** Differences in reporting requirements at national and international levels Difficulties in understanding the definition of environmental indicators Difficulties in providing national environmental indicators following international standards Difficulties in popularising and disseminating environmental accounting Military conflict

Annex 3. Road map of countries, September 2017

Country	Road map
Armenia	✓ Identify accounts according national policy demand ✓ Identify ways to move ahead ✓ Increase capacity and enhance institutional cooperation and partnership ✓ Mobilise and increase financial resources ✓ Various training sessions and technical assistance ✓ Methodological improvements ✓ Increase data availability and data quality
Azerbaijan	✓ Working group created ✓ Energy accounts established ✓ Availability of energy accounts on the website of State Statistics Committee: http://www.stat.gov.az/source/balance_fuel/ ○ Updating and preparation of energy account each year; ○ Creation of reports of accounts on environmental expenditures ○ Preparation of a national methodology
Belarus	✓ 2016: Work on building the SEEA Water has started ✓ 2017: First experimental PSUT Water has been compiled; the methodology for PSUT Water is going to be published in the end of the year ✓ 2018-2022: Forest accounts, water flow accounts, PSUTs for energy, environmental protection expenditure accounts ○ Work is undertaken in accordance with the SEEA-CF ○ Coordinator of the SEEA-CF implementation – Belstat ○ Strong inter-departmental cooperation
Georgia	✓ A mission from a group of Swedish experts on the SEEA soon ✓ Identifying priority accounts for policy-making ✓ Identifying national stakeholders based on the accounts identified by the working group ✓ Identifying data availability/data gaps ✓ Identifying needs for filling data gaps (additional surveys, proxies, etc.) ✓ Preparing SEEA EEAs together with international experts ○ Needs: Technical assistance for preparing detailed road map on establishment of the SEEA
Moldova	✓ Creation of an inter-ministerial working group for implementing the SEEA ✓ Discussion about the intention to create a national strategy for the SEEA implementation and development of an action plan for its implementation ✓ Building institutional capacities through assistance from experienced organisations/institutions ○ Work on experimental calculations (pilot) for the selected accounts ○ Development of the final account, approval by the government and publication of the details

	○ Includ in national statistical activities plan
Ukraine	The Ukrainian statistical system will benefit from the introduction of land cover accounts, which can become a strong information base to be used for: ○ meeting the growing demand for information ○ fulfilment of reporting obligations to the EU ○ environmental legislation ○ defining and monitoring SDG indicators using the international standard approach that ensures international data comparability. Land accounts is a tool for producers of official statistics. ○ An urgent task for Ukrainian Statistics at present is the implementation of all recommendations stipulated in the compendium. ○ Land accounts are the infrastructure of environmental accounting and a basis of environmental information system. ○ A possible task for study — assessment of land degradation — analysis of urban sprawl, agricultural extension and deforestation land uptake. Units responsible for land accounts: ○ Institute of Forestry and Landscape Management is the body responsible for data processing using the GIS system ○ The State Statistics Service of Ukraine participates in data analysis and dissemination ○ Other state bodies and organisations are also responsible for the land accounts The expected results of the project for Ukraine: ○ applying the GIS for creating land accounts that describe the stocks of land cover, the flow of land cover consumption and formation ○ this will probably lead to the replacement of the traditional reporting system with GIS in the future ○ implementing of land accounts plans for the sharing of responsibilities between different institutions — it will involve setting up an inter-agency working group ○ developing of strategy on land accounts — adopting legal acts. ○ reduction in the burden on respondents ○ reduction in costs for producers of statistical information ○ improvement in the quality of data without an increase in costs or respondent burden

Abbreviations

CIRAD French Agricultural Research Centre for International Development

CLC Corine Land Cover

COP Convention of the Parties

EEA European Environment Agency

ENCA Experimental Ecosystems/Natural Capital Accounts

ENI European neighbourhood instrument

GIS Geographic information systems

INCA Integrated system for Natural Capital and ecosystem services Accounting

IPCC Intergovernmental Panel on Climate Change

LEAC Land and ecosystem accounting

MAES Mapping and Assessment of Ecosystems and their Services

NFP National focal point

NSO National statistical office

PSUT Physical supply and use tables

SDG Sustainable Development Goal

SEEA System of Environmental-Economic Accounting

SEEA-EEA SEEA-Experimental Ecosystem Accounting

SEIS Shared Environmental Information System

SNA System of national accounts

TAIEX Technical Assistance and Information Exchange instrument of the European Commission

UN CBD United Nations Convention on Biological Diversity

UNCCD United Nations Convention to Combat Desertification

UNECE United Nations Economic Commission for Europe

UNECE United Nations Economic Commission for Europe

UNSD United Nation Statistical Division