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ENVIRONMENTAL ECONOMIC ACCOUNTING TO ADVANCE EU POLICIES AND PRIVATE CONTRIBUTION TO NATURE INVESTMENTS

In order to pursue a sustainable European future there is growing need for continued strengthening of environmental monitoring. In particular, European policies post-2020 need improved systems of environmental indicators, aligned with the Sustainable Development Goals (SDGs) under the auspices of the UN and the Intended Nationally Determined Contributions (INDCs) – related to the Paris Agreement. Environmental concerns are already integrated in European policies in the 2014 – 2020 period, however, to better articulate economic, social and environmental dimensions of sustainability, as emphasized in recent EU policy papers, will require improved systems of indicators that incorporate all these factors.

In this article it is proposed that the System of Environmental Economic Accounting (SEEA) developed by the UN Statistical Commission, built in harmony with the broadly used System of National Accounts (SNA), can provide suitable database for improving the indicator system for European policies post-2020, so that reliance on both environmental, as well as socio-economic statistics can be enhanced. Advancing the system of indicators for the Common Agricultural Policy is representative in this respect. In this article it is argued that the SEEA, along with ecosystem services accounting, currently in experimental phase, would not only provide extended scope to improving the system of European policy indicators, but could actually channel user feedback to the valuation methodologies of ecosystems, as well as serve as a means to pursue market-based contributions to sustainability and climate goals.

1. INTRODUCTION

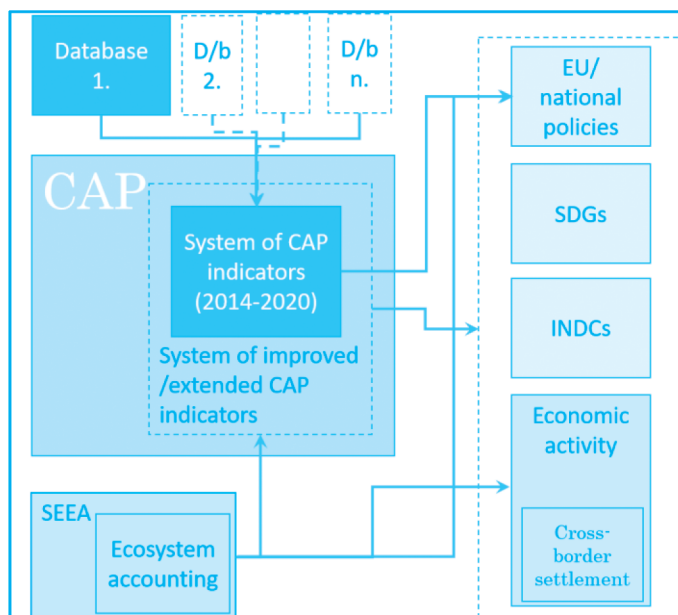
Sustainability has been in the mainstream of EUROPE 2020, Europe's strategy covering the 2014-2020 period. Also, Europe played key role in shaping the global 2030 Agenda, under the auspices of the United Nation; its 17 sustainable development goals (SDGs) and the associated 169 targets. SDGs are foreseen to be fully integrated in the European policy framework and sectoral policies in the next financial period (EC, COM(2016) 739 final, p. 3); in this respect, in particular, it is highlighted that 'simplification and modernization' of the Common Agricultural Policy is essential to contributing to the SDGs.

Agricultural activity has direct impact on the environment and, in fact, scholarly literature reports that improving ecosystems can directly contribute to a number of SDGs (Wood, at al., 2018). In this regard, contribution by the private sector is essential: while it is justified to assume that command-control regulatory systems and voluntary measures could be largely complemented

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by possible markets and market mechanisms creating links between the environment and economic activities. Defined ownership of environmental assets and appropriately designed mechanisms to settle transactions are prerequisites to operate such markets. In this paper it is suggested that the System of Environmental Economic Accounting (SEEA) including ecosystem accounts, while contributing to improving the CAP indicator system, can create the framework necessary to settle economic transactions with an impact on the environment.

Figure 1 shows the conceptual framework of generating and using CAP indicators during the period of the 2014-2020 financial framework, and potentially thereafter. In the current system CAP indicators are generated using datasets from European and various national sources and are used to serve primarily policy making. It is claimed, as shown in the figure, that the SEEA, potentially extended with ecosystem accounts, enables designing an improved system of CAP indicators in harmony with the SDG indicator system and/or aligned with the system of INDCs. Physical and monetary accounts in the SEEA system can directly serve policy making, as well as the settlement of economic transactions with environmental impact.



source: the author

Figure 1. Generation and potential use of CAP indicators

2. SUSTAINABILITY, CLIMATE CHANGE AND THE CAP

The UN Sustainable Development Goals were formally adopted by UN member states in 2015 as the 2030 Agenda for Sustainable Development. The Paris Agreement entered into force in 2016 aiming at limiting the rise of global temperature below 2°C. Every target attached to the 17 SDGs (altogether 128, plus 42 kind of horizontal targets) is defined together with an indicator; many targets are defined in numerical forms, others are expressed in softer terms. Implementation

of the Paris Agreement, closely linked to the SDGs, provides a roadmap for climate actions to reduce the emission of greenhouse gases (GHG) and build climate resilience. 188 countries submitted their Intended Nationally Determined Contributions (INDC), related to the Paris Agreement. The joint INDC declaration of the 28 EU member states, submitted by the Latvian Presidency of the European Union, included a commitment to a binding target of 40% domestic reduction of greenhouse gases by 2030, compared to 1990.

Like many other policies of the EU, CAP has direct relevance to both the SDGs, as well as the Paris Agreement. The LULUCF (land use, land-use change and forestry) legislation (European Parliament and the Council, Decision No 529/2013/EU), rooted in the IPCC Kyoto Protocol, for instance is directly referenced in the EU INDC (Latvia; EC, 2015).

The Common Agricultural Policy of the European Union (CAP) is a key European policy in this regard. As set by a 2017 Communication of the EC CAP, in the next financial period, CAP must continue, ‘...boosting employment, growth and investment...while bolstering environmental care and fighting and adapting to climate change.’ (EC, COM(2017) 713 final, p. 7)

In fact, sustainable development has already been one of the three priorities of the CAP during the period of 2014-2020, too. While CAP has primarily been built aligned with Europe 2020, the overall strategic framework of the EU, a recent communication of the European Commission (EC, COM(2017) 713 final) titled the Future of Food and Farming set natural environment and climate change (along with global lead position of EU farming) as main priorities for the EU’s farm sector. The document states that

„...the EU is strongly committed to action on the COP21 Paris Agreement and the UN Sustainable Development Goals...notably, the CAP underpins the policies spelled out in the 2030 Climate and Energy Framework, which calls upon the farming sector to contribute to the economy-wide emission reduction target of -40% by 2030 and the EU adaptation strategy. European farming also needs to step up its contribution towards the EU environmental objectives. These commitments cannot be met without farmers, foresters and other rural actors who manage over half of the EU’s land, are key users and custodians of the related natural resources and provide large carbon sinks as well as renewable resources for industry and energy. This is why a modernised CAP should enhance its EU added value by reflecting a higher level of environmental and climate ambition, and address citizens’ concerns regarding sustainable agricultural production.“ (EC, COM(2017) 713 final, p. 7)

The Cork 2.0 Declaration in 2016, titled “A Better Life in Rural Areas”, the outcome of the European Conference on Rural Development, specifies 3 strategic directions (out of 10), which explicitly target the subjects of sustainability and climate change:

- Preserving the rural environment;
- Managing natural resources;
- Encouraging climate action.

In particular, CORC 2.0 considers “the key of rural areas and communities in implementing the UN SDGs as well as the conclusions of COP21 and is confident that a result-oriented CAP

and Rural Development Policy is a key instrument to deliver priorities.” (EU, CORC 2.0 Declaration 2016)

It is implied by the above that, in order to support CAP in the next financial period, improvements are needed in the system of indicators.

3. CAP INDICATORS

Environmental concerns, integrated in the CAP during the 2014-2020 period, are monitored using a system of indicators developed to meet the growing needs of policy (that time), in particular the reforming of the CAP (EC, COM(2006) 508).

The system of indicators developed for the purpose of CAP is described in a Commission Staff Working Document (EC, SEC(2006) 1136) that reports on and presents the main findings of the IRENA operation, the project to develop the CAP indicator system, along with identifying key challenges and proposed future actions. IRENA was launched in 2002, backed by two Commission Communication documents (EC, COM(2000) 20 final), (EC, COM(2001) 144 final). Developing the indicators, underpinned by existing data sources, was coordinated by the European Environmental Agency.

The system and the specification of the 35 indicators developed by IRENA indicates clear focus on supporting policy-making (EC, COM(2006) 508). Also, the accompanying Commission Staff Working Document (EC, SEC(2006) 1136) addresses the deficiencies of the methodology used in IRENA for modelling the agricultural – policy framework, DPSIR: Driving force-Pressure-State-Impact-Response; noting, in particular that the model is a simplification of reality (EC, SEC(2006) 1136, p. 5).

Based on the above it can be concluded that it is more than timely to incorporate more socio-economic factors in a reframed system of indicators of the CAP. The need for a reframed indicator system for CAP, as well as policy and economic decision making in the agricultural sector with more focus on socio-economic factors in the next financial period is aligned with a recent EC Communication that calls for a renewed European financial system that shifts savings towards more sustainable investments:

„...improving the contribution of finance to sustainable and inclusive growth by funding society’s long-term needs...incorporating environmental, social and governance factors into investment decision making.” (EC, COM(2018) 97 final, p. 1)

A reframed CAP indicator system with pronounced socio-economic focus needs new base data that include both physical, as well as monetary metrics.

This paper argues that complementing existing databases with data from the system of environmental economic accounting, that incorporates accounts of ecosystem services, could provide the means to turn the system of CAP indicators from targeting solely policy into an integrated instrument to serve both policy and business purposes.

In the next section environmental aspects of the CAP is introduced along with the current policy centred system of agri-environmental indicators. It is followed by introducing the System of Environmental Economic Accounting being developed by the United Nations Statistical Commission, with foreseen implementation in the EU. Then, to make a link with the European

economy, the initial progress in turning the EU financial system green will be reviewed, Finally, the potential opportunities offered by SEEA that regards a renewed CAP indicator system will be discussed.

4. CAP AND THE ENVIRONMENT

The policy context of the system of agro-environmental indicators of the CAP is explained in the relevant EC Communication document (EC, COM(2006) 508). As early as 1998 the Cardiff European Council endorsed the principle that all EU policies shall integrate environmental dimensions. This principle was endorsed for the CAP by the Helsinki European Council in 1999. In 2001, the EU Sustainable Development Strategy (EC, COM(2001)264 final) required that economic, social and environmental effects shall be taken into account in all policies. In 2009, the Agriculture Council adopted the conclusion that environment and sustainable development shall be integrated in the CAP and invited the Commission to monitor and evaluate this integration, and further improve agri-environmental indicators, including defining statistical needs of the system of indicators. Then 35 indicators with analytic framework² and the statistical needs³ were defined for launching the IRENA operation in 2002.

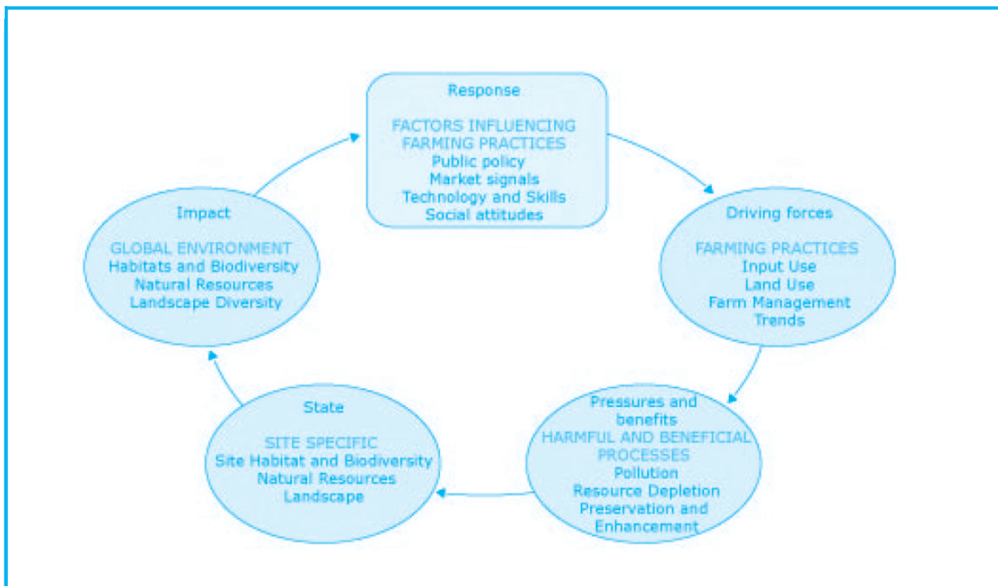


Figure 2. The DPSIR framework

Source: (EC, SEC(2006) 1136)

The 35 indicators, the outcome of IRENA, are organized in the DPSIR framework in 5 domains, then sub-domains, shown in Figure 2.

Figure 3 shows the Response sub-set of CAP indicators:

Domain	Sub-domain	Indicator
Response	Policy	Agri-environmental commitments
		Agricultural areas under Natura 2000
	Technology and skills	Farmers' training levels and use of environmental farm advisory services
	Market signals and attitudes	Area under organic farming

Figure 3. „Response” sub-set of agri-environmental CAP indicators

Source: (EC, SEC(2006) 1136)

According to the relevant Staff Working Document (EC, SEC(2006) 1136) IRENA achieved the objectives of developing indicators, collecting data and producing reports. In particular, data for generating indicators are from a wide range of sources: existing environmental and agricultural databases, etc., collected at different geographical and time scales.

The IRENA Indicator Report provides an evaluation of the developed indicators based on an evaluation framework with six criteria:

1. policy-relevance;
2. responsiveness;
3. analytical soundness;
4. data availability and measurability;
5. ease of interpretation;
6. cost effectiveness.

The six criteria, in particular Criteria 1. imply that the overall goal of the system of indicators is to serve primarily policy needs. i.e. to demonstrate the integration of environmental concerns in the CAP, aiming at monitoring European farming and its actors in meeting environment and sustainability considerations.

5. ENVIRONMENTAL ACCOUNTING

Establishing environmental accounting was called for in Agenda 21, adopted by the United Nations Conference on Environment and Development held in Rio de Janeiro, Brasil in 1992. In particular, it called for establishing a programme to develop national systems of integrated environmental and economic accounting in all UN countries, as ...integrated social, economic and environmental data and information are important to decision making processes. Built on initial UN published handbooks for national accounting the United Nations Statistical Commission adopted the *System of Environmental- Economic Accounting 2012—Central*

Framework (SEEA CF) (United Nations, CF 2014), as a first international statistical standard for environmental-economic accounting. The SEEA CF, released under the auspices of the United Nations, the European Commission, FAO, the OECD, the IMF and the World Bank Group, is a multipurpose conceptual framework focused on understanding the interaction between the economy and the environment, describing stocks and changes of stocks of environmental assets. In particular: „...SEEA CF is a statistical framework consisting of a comprehensive set of tables and accounts, which guides the compilation of consistent and comparable statistics and indicators for policymaking, analysis and research.” (United Nations, CF 2014).

SEEA CF is structured linked to the System of National Accounts (SNA), an internationally agreed standard set of recommendations on how to compile measures of economic activity, consisting of macroeconomic accounts. Going beyond SNA, however, SEEA CF provides guidance on the valuation of renewable and non-renewable natural resources. While recommendation regarding the valuation methodology, as such, is not provided, it implies the possibility of creating linkage between the environment and economic activities that have an impact on the environment, either by generating externalities, or using natural resources as inputs to economic activities.

With respect to this particular feature of the new accounting system, SEEA CF is complemented by two other publications: SEEA Experimental Ecosystem Accounting (United Nations, EEA 2014) and SEEA Application and Extensions. As explained in the Central Framework (United Nations, CF 2014) the SEEA Central Framework and Experimental Ecosystem Accounting jointly have the potential to comprehensively capture the relationship between the environment, as well as economic and other human activities.

As described in the Preface of the UN document (United Nations, EEA 2014), Ecosystem accounting integrates complex biophysical data and use of those data, ...to track changes and measure flows and services from ecosystems...with linkage to changes in economic and other human activity...serves as a platform for the development of ecosystem accounting at national and sub-national level.

Both SEEA Central Framework, SEEA Experimental Ecosystem Accounting are routed in and linked to the System of National Accounts (SNA).

„...the SNA, which is the international statistical standard for the compilation of national accounts, incorporates many of the most commonly considered economic measures, such as gross domestic product (GDP), household consumption and saving, investment (capital formation), profits (gross operating surplus), exports and imports, and measures relating to assets and liabilities. The first SNA, entitled A System of National Accounts and Supporting Tables, was finalized in 1953 (United Nations, 1953) and the most recent version (European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank, 2009) was adopted in 2008...”

The document explains that the primary reason for developing SEEA EEA was

„...that the SNA does not provide an explicit or comprehensive accounting for environmental stocks and flows that are relevant in the context of a more complete assessment of economic activity. In this context, SEEA Experimental Ecosystem Accounting represents one approach to extending the SNA...”

In particular, it is the role of valuation, i.e. creating value accounts for stocks and flows in the SEEA EEA that is aimed at providing the link, missing in the SNA, between the environment and economic activities.

The document continues:

„...the potential of ecosystem accounting as described in SEEA Experimental Ecosystem Accounting is not restricted by a requirement to value ecosystem assets and ecosystem services in monetary terms or by the desire to derive degradation-adjusted measures of national income... A general motivation for the development of ecosystem accounting is its capacity to provide information needed for tracking changes in ecosystems and linking those changes to economic and other human activity...”

This can be furthered by saying that the primary objective of SEEA EEA is to advance policy-making by providing better estimation of social benefits, in monetary terms. This paper proposes that this capacity of SEEA EEA can be broadened to serve as means of settlement for economic transactions, both for public, as well private actors, i.e. government and industry.

„...SEEA Experimental Ecosystem Accounting provides insights into how ecosystems can be conceptualized as a form of “capital”, which may then be considered in relation to other measures of capital, including economic, human, social and other environmental capital...”

The three critically important issues in ecosystem accounting are

1. how to value ecosystems;
2. how to value ecosystem services, and
3. how to link economic transactions with physical measures of ecosystems.

Ecosystem Services framework

The concept of ecosystem services is meant to express nature-benefits enjoyed by humans and the society. The concept was popularized by the Millenium Ecosystem Assessment (MEA), a report by a UN funded project in the early 2000s. As a main goal, the ecosystem framework is intended to support environmental policy and decision making – and potentially economic decision making – by combining ecological, economic and social perspectives. There are various systems to classify ecosystems; those most frequently referenced are the Common International Classification for the Ecosystem Services (CICES), developed by the European Environmental Agency, and the system developed by The Economics of Ecosystems and Biodiversty (TEEB), a global initiative linked to the European Commission and the UNEP. The various classifications are based on the conceptual model of ecosystem services cascade, shown in Figure 4.

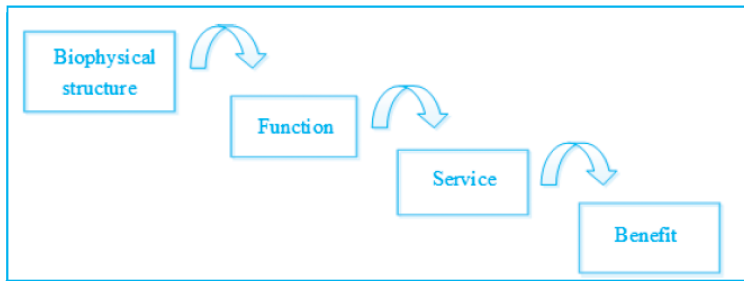


Figure 4. Simplified ecosystem services cascade model

Source: (La Notte, at al., 2017)

The cascade model represents that the ecological structures and processes created by living organisms, through their functioning to produce goods and services, benefitted by people and economic units.

The SEEA Experimental Ecosystem Accounting is a template and recommendation to designing the ecosystem accounting framework and combining it with standard national accounts (SNA). Creating this system is in a pilot phase in a few countries; at the end of 2017 the European Commission published a technical report, prepared by JRC, the policy support arm of the EC titled, Implementing an EU system of accounting for ecosystems and their services (La Notte, at al., 2017)

Ecosystem accounting, linked to the SEEA Central Framework, is composed of stock (ecosystems) and flow (ecosystem services), biophysical and monetary accounts respectively. There are various methodologies to measure and value ecosystem services reported by numerous academic literature (Marjainé Szerényi, at al., 2001); (Brown, at al., 2007). Also, it is major challenge to link physical measures with economic transactions, which is a case-by-case exercise and subject to negotiations between the transactional parties. Discussion on this, otherwise key subject, likewise the subject of ecosystem valuation, is not developed further in this paper.

6. SUSTAINABLE GROWTH FINANCING

As the EC document (EC, COM(2018) 97 final) explains, addressing climate and sustainability targets (SDGs and INDCs) requires the contribution of the private sector. The proposition in this paper that SEEA can actually enhance the contribution of the private sector to sustainability and climate goals via market based transactions is fully aligned with this EU policy.

In order to reorient private capital to more sustainable investments a comprehensive shift regarding how the financial system works is required. In particular, it is necessary to

1. reorient capital flows towards sustainable investment in order to achieve sustainable and inclusive growth;

„...Europe has to close about €180 billion annual investment gap so that climate and energy targets can be achieved by 2030...”

2. manage financial risks stemming from climate change, resource depletion, environmental degradation and social issues;

„...even a world temperature increase of 2 degrees Celsius could have destabilizing effects on Europe’s economy and financial system...”

3. foster transparency and long-termism in financial and economic activity.

„...Sustainability and long-termism go hand in hand. Long-termism describes the practice of making decisions that have long-term objectives or consequences. Investments into environmental and social objectives require a long-term orientation...”

For each three goals in the EC Communication document (EC, COM(2018) 97 final) individual actions are defined. Hereinafter, due to its direct relevance, actions to pursue **capital flow reorientation** is discussed in more details:

Action 1 – Establishing an EU classification system for sustainable activities

This action includes setting up EU taxonomy for climate change, environmental and socially sustainable activities, which, engaging an expert group, will be incorporated in EU legislation, standards, labels, etc.

Action 2 – Creating standards and labels for green financial products

The standard for green bond issuance will be actualized and EU ecolabel framework will be created for other financial instruments and products.

Action 3 – Fostering investment in sustainable projects

This Action will include reinforcing relevant advisory capacity for developing sustainable infrastructure projects and further measures to improve the efficiency and impact of sustainable investment support.

Action 4 and Action 5 focus on financial advisory and benchmarking activities. The conceptual framework of implementing the Action Plan is shown in Figure 5:

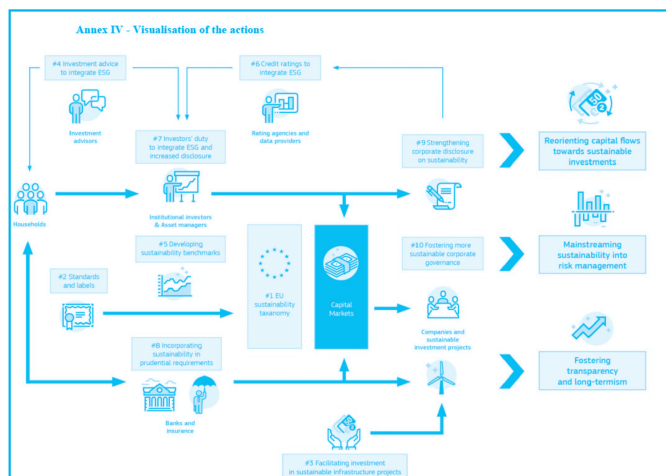


Figure 5. Implementation of the Action Plan for a sustainable financial system in the EU

Source: (EC, COM(2018) 97 final)

7. DISCUSSION

SEEA is positioned to make pivotal contribution to designing and monitoring the implementation of a revised CAP in the next financial period of the EU after 2020.

SEEA Central Framework is complemented by two additional publications: *SEEA Experimental Ecosystem Accounting* (United Nations, EEA 2014) and *SEEA Application and Extensions*. As explained in (United Nations, CF 2014), SEEA Central Framework and SEEA Experimental Ecosystem Accounting together have the potential to comprehensively capture the relationship between the environment and economic and other human activity. This directly reflects on the critical comment on the CAP indicator system in the report on the IRENA operation:

“...many of the interactions between agriculture and the environment are not sufficiently understood or are difficult to capture in a single framework. In addition, there are other, socio-economic, factors independent of the policy framework, which can determine changes in farming systems and rural areas and can also significantly affect the environment...” (EC, SEC(2006) 1136, p. 5)

SEEA is expected in the upcoming period to become an important instrument to serve various EU policies, including CAP. This is manifested by the JRC document, proposing the application of the SEEA in Europe. The potentials of the SEEA in pursuing the private sector to contribute to sustainability and climate goals, by shifting funding to investments with measurable impact on the environment and sustainability, however, needs more attention from policy and the academic communities, as well.

Each element of the conceptual framework to support commercial investments in nature requires further elaboration and country specific solutions. This would include identification and valuation of ecosystems and ecosystem services, creating accounting tables with proper linkages between physical and monetary accounts, At a higher abstraction level, however, research should be focused on how the SEEA and ecosystem accounts would be incorporated in the accounting principles and books of legal entities, for-profit, or not-for-profit, as well. How benefits from the environment and environmental risks, both with appropriate metrics for physical and monetary accounts, would influence accounting rules.

An issue of particular interest, research on the principles and methodologies of valuating ecosystems and their services could largely benefit from investigation on the feedbacks from business accounting that could substantiate addressing several issues of valuation problems discussed in the literature (Marjainé Szerényi, Zsuzsanna; at al., 2017).

Nevertheless, since the SEEA is based on the System of National Accounts, the UN recommendation and the associated European document by the JRC can provide the pathway to develop ecosystem accounts by each national statistical services, including the Hungarian Central Statistical Office. Pilots to build national SEEA has already been launched within the framework of a global project funded by the European Union: Natural Capital Accounting and Valuation of Ecosystem Services. Pilot countries are Brasil, China, India, Mexico and South Africa (United Nations, n.d.).

It is assumed that national systems for environmental economic accounting, designed based on the SEEA standard, would harmonize with each and one another. This would enable

accounting for cross-border transactions, as well, akin to the flexibility mechanisms of the Kyoto Protocol, e.g. the Clean Development Mechanism, CDM. The improvement of ecosystem/ecosystem services in Country A, using SEEA ecosystem accounts, could be purchased by Country B through innovative transactions. The nature-investment then could be financed via international financial institutions, or commercial banking instruments.

8. CONCLUSION

The key contribution of the SEEA and ecosystem accounting is that they offer solution to market failures related to the environment by enabling to assign ownership to environmental assets.

While the SEEA and the EU funded pilots are primarily pursuing policy supporting perspectives, the technical documents show direct relevance to the possible incorporation of market based transactions in financing nature improvement projects by public and private actors. The potential focus on the private sector is a very important feature of SEEA that would require further studies and pilot programs.

An accounting system built on physical, along with monetary accounts, by providing bases for the analysis of environmental scenarios in financial terms, can better support policymaking, as well as decisions by the private sector, including, in macroeconomic terms, pursuing shifting savings towards sustainable investments.

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