

29th Meeting of the London Group on Environmental Accounting
Session 2: Accounting for ecosystem services in physical and
monetary terms

**Comparison of crop provision and wood provision ecosystem
services**

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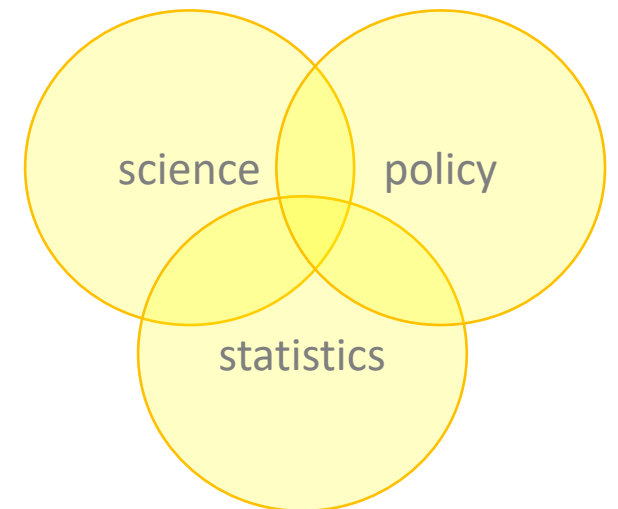
The analyses is based on the work done in the frame of Eurostat grants “Development of the land account and valuation of ecosystem services regarding grassland ecosystem” (831254-2018-EE-ECOSYSTEMS) and “Development of the ecosystem accounts” (881542-2019-ENVECO and 101022852-2020-EE-ENVACC).

Purpose for presenting the work to the London Group

Analyses addresses parallel methods for the assessment of the ecosystem service of crop provision (agricultural production) and timber provision ecosystem services.

We think that handling of these services has to be consistent to certain extent

In general, there is no clear framework to calculate the contribution of the ecosystem to the value of the services, we turn LG attention on the issue.



Scope of the work

Physical and monetary valuation: parallel methods for the assessment of the ecosystem service of crop provision (agricultural production) and timber provision ecosystem services.

Contribution of the ecosystem to the value of the service:

In general, there is no clear framework to calculate the contribution of the ecosystem to the value of the services, therefore similarities and differences when accounting for two large ecosystem provisioning services are discussed

Methods for the isolation of ecosystem contribution in physical and monetary terms are discussed. Similarities and differences are discussed and the communication issues regarding the results of the alternative approaches for given ecosystem services will be described.

CROP

- ecosystem contribution to plant growth as approximated by the amount of harvested crops for different uses

TIMBER

- ecosystem contribution to the growth of trees and other woody biomass approximated as increment

Forest ecosystem versus agricultural ecosystem

AGRICULTURAL ECOSYSTEM

is generally characterized by the crop provisioning ecosystem service

FOREST ECOSYSTEM

is characterized by the multitude of ecosystem services, it offers both provisioning, regulating and cultural services

- Services are competitive and exclusive

Valuation of ecosystem services in physical units

CROP

- ecosystem contribution to plant growth as approximated by the amount of harvested crops for different uses

TIMBER

- ecosystem contribution to the growth of trees and other woody biomass approximated as increment

VALUATION IN PHYSICAL UNITS:
service valuation and ecosystem contribution

SERVICE
VALUATION

CROP

Harvested biomass

TIMBER

Increment
Removals

ECOSYSTEM
CONTRIBUTION
OTHER
APPROACHES

Ecosystem contribution to
plant growth less inputs
Emergy approach
Organic agriculture

-

Valuation in physical units, difference in handling the service



Forest (timber)

Removals

Increment

Agriculture
(crop)

Crop provision

Economy

service in
accounts

STATISTICS
ESTONIA

Crop production ecosystem service is captured on the point of the entrance to economy while in case of timber provisioning the increment taking place sparsely in ecosystem. „Increment“ as a base of calculating ecosystem service does not consider that supplying wood provisioning services has a significant impact on the total value of ecosystem services of a particular forest

Observations: valuation in physical terms



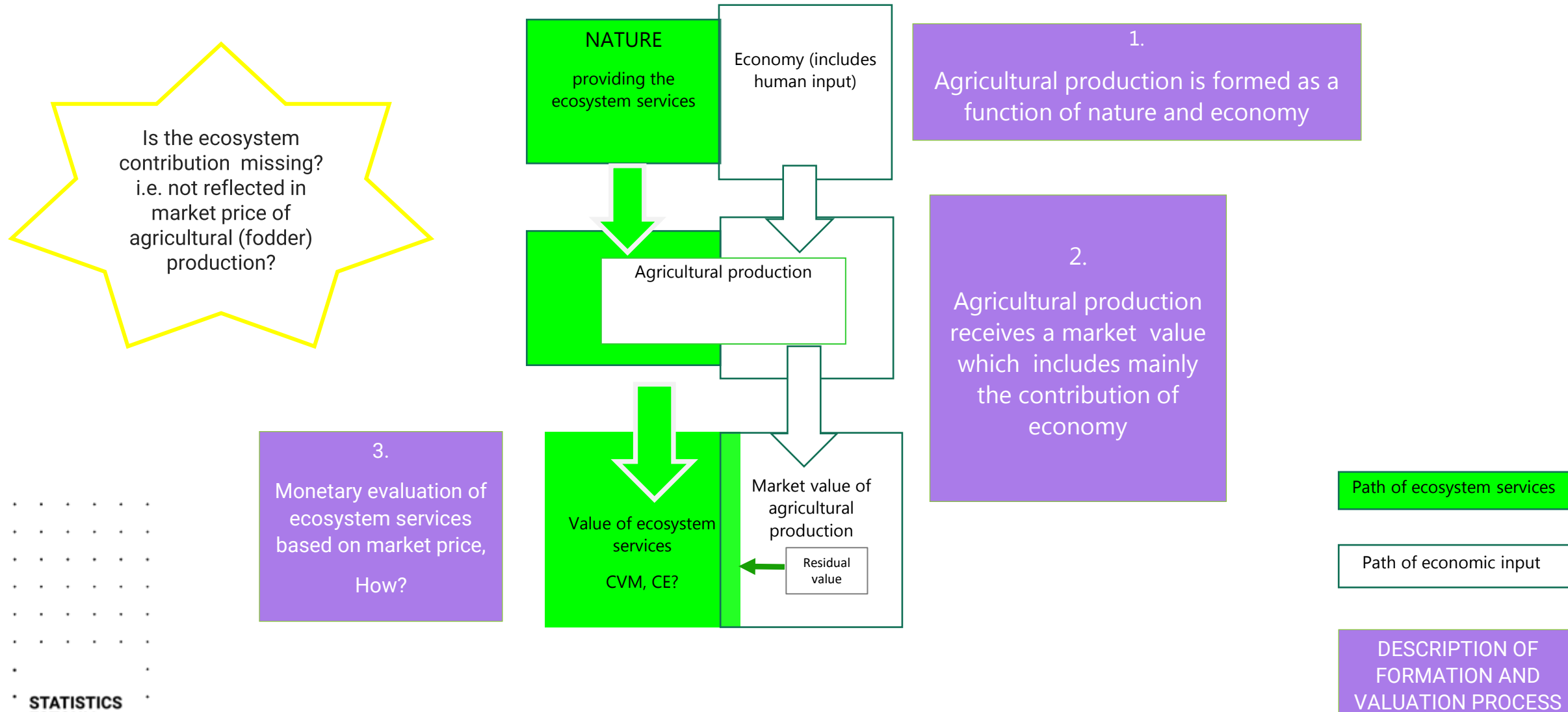
- Different logic for the accounting of crop and wood provisioning services
 - Crop production ecosystem service is captured on the point of the entrance to economy while in case of timber provisioning the increment taking place in ecosystem is currently considered.
- Use of increment as a base of calculating ecosystem service may give a false impression that the use of supply services does not have a significant impact on the total value of ecosystem services of a particular forest.
- An alternative and better option **for timber** ecosystem service definition which is analog to the methodology for the crop provisioning service and also more real economy-based approach, is to account for the removals (second proposed indicator for ecosystem accounting in relevant guidance note). Using removals would be more integrated to the other forest ecosystem services of the same ecosystem.
- In order to approximate the ecosystem contribution to the provisioning of the ecosystem services (especially regarding **crop** production ecosystem service) other alternatives considering the soil contribution etc are also under discussion already and should not be forgotten. These should possibly be considered in future.

Monetary valuation

Conceptual questions related to the supplied services of ecosystems:

- 1) what is the real contribution of the ecosystem to the output of the supplied service (production as a commodity with market value);
- 2) whether and if, to what extent, the contribution of the ecosystem is reflected in the price of production (as the output of the provisional service).

SCHEME: agricultural production and ecosystem service: does market price based evaluation method reflect ecosystem contribution of agricultural production sufficiently*



*London Group article 2020 "Two Languages or Two Narratives: Comparison of the Selected Market Price and Revealed Preferences Valuation Methods to the Stated Preferences Method", Statistics Estonia

How could the non-market values be measured and which methods to consider?

1. Identifying the gaps (currently it seems that there is no relevant accounting system for non-market component for ecosystem services).
2. Give a basis for developing accounting structure for non-SNA values.
3. Identifying the ecosystem component contributing to the economic production. Which methods?



Methods for the ecosystem service valuation in monetary units

CROP

Rent price
Resource rent
Market output

TIMBER

Net income
Average stumpage price
Output value

Link to the forest accounts

Monetary valuation, crop production

Values of crop supply ecosystem service and ecosystem contribution, million €, 2020 and their relative volume

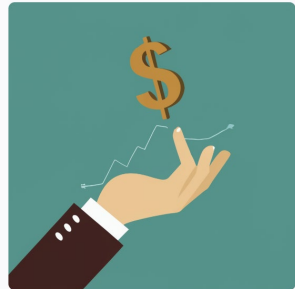
Valuation method	Value of the crop production service	Value of ecosystem contribution	% of the market price-output for agriculture	% of the rent price evaluation method
Rent price		71.7	15.7	100
Resource rent		17.7	3.9	24.7
Output of the agricultural activity less the output of other than crop production agricultural activities	456.8			

Monetary valuation, timber provision

Values of timber supply ecosystem service and ecosystem contribution, million €, 2020 and their relative volume

Valuation method	Value of the timber production service	Value of ecosystem contribution	% of the market price of forestry output
1. Net income (resource rent)	135.5 (removals)	142.2 (based on net increment)	20.7
2. Stumpage price method (forestry account: value of timber minus the costs of forest felling) –	304.7 (removals)	319.8 (net increment)	46.6
3. Output value of the forest activity less the output of the side activities.	685.8		

Observations: valuation in monetary units



- One aspect is clear: the contribution of ecosystem is a precondition that the service can be supplied
- What contribution is captured in economy so that it can be calculated based on market prices?
- For crop: the resource rent calculated gives just 4% of the value of output. It is possible that the contribution of ecosystem is not considered in the market price in case of agricultural production and hence this could not be separated. **Rent price** method was preferred as the one which reveals willingness to pay (in context of expenses) in order to use ecosystem service. Not ideal as well.
- For the timber provision ecosystem service: monetary valuation the use of the rent price method however is not realistic as the forest land as a mean of production is in principle usually not rented. If smth, stumpage prices based method is suggested. Stumpage prices method separates reasonably contribution of ecosystem and economy because it reflects better the value of timber as ecosystem provisioning services after the deduction of harvesting costs.
- In general, there is no agreed framework nationally to calculate the contribution of the ecosystem to the value of the services

Conclusion

Physical
valuation

CROP

Harvested biomass

Investigate further the
ecosystem contribution to plant
growth

TIMBER

Replace „*Increment*“ with
„*Removals*“

Monetary
valuation

Rent price, not ideal but
reflects the real payment for
the ecosystem potential
without economy
contribution

Stumapge prices approach,
not ideal but reflects
component of ecosystem in
the value of removals

Estimation of the value of a provisioning service and finding its monetary equivalent

If we want to estimate the value of a provisioning service and find its monetary equivalent, we need to define the nature of the service.

First of all, we have to answer the question, **what exactly do we want to find:**

a) either to find out **the component of the contribution of the ecosystem** in the price of production

or

b) to assume that the market price of the product reflects the service of the ecosystem only **partially** and large part of the value of the service **is not included** in the market price of the product.

When evaluating the provision service, is it acceptable that the value of the ecosystem service has a part that is included in the market price and a part that is not included in the market price of the product?

Read more:

[Chance for Better Policy: Can Ecosystem Account Provide a Missing Link between the Services Provided by Ecosystems and the Land Owners](#); UN London Group on Environmental Accounting, 2020;

[Two Languages or Two Narratives: Comparison of the Selected Market Price and Revealed Preferences Valuation Methods to the Stated Preferences Method](#); UN London Group on Environmental Accounting, 2020

Ecosystem Services partnership 3rd conference, T17 From assessment to accounting: how countries experience the development of NCA. Insights from applications. [Lessons learned on accounting for ecosystem services: bridging the values of services and measures taken](#). Juuni, 7-10, 2021

6th Joint OECD/UNECE Seminar on Implementation of SEEA. Session: [SEEA ecosystem accounts and its relevance in policy and decision making](#) March 9th 2021.

Dedicated website:

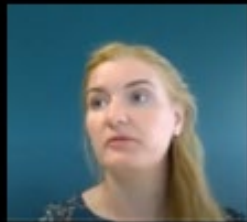
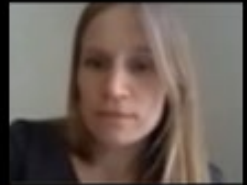
<https://www.stat.ee/en/find-statistics/statistics-theme/environment/biodiversity-protection-and-land-use>

Seminar „Development of ecosystem extent account and valuation of ecosystem services“ June 11, 2021, Zoom meeting, click [here](#)

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Thank you!



In general, there is no clear framework to calculate the contribution of the ecosystem to the value of the services,
therefore

similarities and differences when accounting nationally for these two large ecosystem provisioning services were discussed and London Group on environmental accounting is invited to give their opinions on conclusions and methods and to show their views on the need to develop the topics further.
