THE FOREST ACCOUNTS IN THE CREEA PROJECT

1 Introduction to CREEA

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The main goal of CREEA is to refine and elaborate economic and environmental accounting principles as discussed in the London Group and consolidated in the future SEEA 2012, to test them in practical data gathering, to troubleshoot and refine approaches, and show added value of having such harmonized data available via case studies.

This will be done in priority areas mentioned in the call, i.e. waste and resources, water, forest and climate change / Kyoto accounting. For more information contact the co-ordinator at: arnold.tukker@tno.nl

2 Work package on forest accounts

The Work Package 5 is devoted to forest accounts and its objectives are:

- Revising, refining and testing the methodology for forest accounts as suggested in the existing draft of the SEEA 2012
- Develop a procedure for incorporating UNECE/FAO data and national forest statistics into the SEEA 2012 integrated economic and environmental accounts system
- Investigate the usefulness of the SEEA 2012 forest related indicators for the development of forest policies at the EU and national level
- Providing a dataset of SEEA 2012 indicators for two test regions.
- In short, such a program fills in remaining gaps in SEEA 2012, gives guidance into the most effective ways of practical implementation (particularly data gathering), and can build a case showing the added value of practically implementing SEEA 2012.

2.1 Task 5.1

The main aim of the first task corresponding to the present deliverable is to revise the proposed SEEA 2012 forestry tables. This revision was focused on the following aspects:

- Review the proposed changes in the SEEA 2012, with regards to the previous version of the tables (SEEA 2003), and comment on the usefulness of these changes;

- Evaluate the completeness of the SEEA 2012 forestry tables, with regards to the stock and flow of all forest goods and services, including non-market goods and services, and propose options for improvements;
- Estimate the feasibility of the implementation of the SEEA 2012 in the EU Member States (MS). This aspect will be conducted in collaboration with EU Member States' statistical offices and/or other agencies responsible for the provision of national data on forests and forestry. The involvement of national agencies will be achieved through questionnaires and interviews (if needed for clarification of responses to questionnaires).

The general impression is that SEEA 2012, differently from SEEA 2003, stays to a longer extent in the realms of the theory and provides less practical indications on how to proceed with the accounts. Furthermore, some ideas that were presented in SEEA 2003 (e.g., including forest management account) were omitted from the SEEA 2012. On the other hand, some topics (e.g., ecosystem accounts or depletion of natural resources) that were very briefly mentioned in SEEA 2003, are provided much more attention in SEEA 2012. However, also in these cases, the presentation is rather limited to theoretical aspects.

2.1.1 Main differences between SEEA 2003 and SEEA 2012

The boundary between cultivated and non-cultivated timber resources in SEEA 2003 was based on the forest classes as defined by FAO. Hence, timber in primary forest was classified as natural or non-cultivated resources, while timber resources from other naturally regenerated areas and plantations were classified as cultivated. However, the rules by which different areas of forest land are differentiated may not align neatly with the production boundary of the SEEA or SNA. As an example, SEEA mentions some countries where large areas of planted forests that are not managed directly or where trees are left to grow until ready to harvest. These forests would be considered natural timber resources if following the SEEA production boundary; even though the term "planted forests" may immediately suggest a high level of economic activity. Furthermore, this approach cannot be used in the case of timber resources outside of forests, for example in orchards or in other wooded land (OWL).

SEEA 2012 recognizes that the treatment of timber resources as either cultivated or natural depends on the applied management practices. **The key consideration is that the processes involved in cultivation must constitute a process of economic production**. Thus, given the potential for forestry management practices to vary considerably across countries, SEEA recommends that countries determine the status of their timber resources as being either natural or cultivated, based on application of the production boundary considerations.

This change to a more flexible system allows accounting for timber coming from areas different from forests. Furthermore, it also gives countries the possibility to define a forest as cultivated/- non- cultivated, which better accounts for diverse management situation and reduces misinterpretations.
SEEA 2012 removes the classification of forest land in cultivated/non-cultivated and also the division into available/not available for wood supply, which were included in the SEEA 2003. This change is aimed to clearly distinguish the timber account from that regarding

land accounting. To clarify these aspects, SEEA 2012 includes some paragraphs to better explain the distinctions between these two accounts.

The reason for removing these categories is to make a clear distinction between forest land and timber resources, emphasizing that forest land is not only a source of timber (and hence shouldn't be classified only according to its availability for supplying timber). This way, the forest land accounts will keep track of changes such as deforestation/afforestation processes, whereas timber accounts would focus on the value of timber resources removed from areas of forest and OWL (but also allowing to account for timber resources outside these areas).

Hence, forest land in SEEA 2012 is classified according to different types of forest. The primary distinction is between naturally regenerated and planted forest. Two broad types of naturally regenerated forest are distinguished: Primary forest and Other naturally regenerated forest. Where possible, accounts should be compiled using this classification of forest and OWL types. In addition, countries could introduce accounts for different tree species.

Box 1. Timber resources in SEEA 2003 and in SEEA 2012

The changes between the two versions of SEEA regarding timber resources, are mainly related to the implementation of a more flexible definition not so strictly related to the FAO definitions.

In SEEA 2003, following strictly FAO classifications may turn out to be problematic in some situations:

1. There are large areas of planted forests that are not managed directly or frequently and the trees are left to grow until ready to harvest. These trees would be considered natural timber resources following the SEEA production boundary even though the term "planted forests" may immediately suggest a high level of economic activity.
2. This approach cannot be used in the case of timber resources found outside of forests for example in orchards or in other wooded land.

Differently, SEEA 2012 allows for:

1. Recording timber growing outside forests.
2. Each country can determine the status of their timber resources as being either natural or cultivated, based on application of the production boundary considerations. Cultivated resources are likely to include activities such as (a) control of regeneration, for example, seeding, planting of saplings, thinning of young stands; and (b) regular and frequent supervision of trees to remove weeds or parasites, or to attend to disease. The level of these types of activity should be significant relative to the value of the timber resources and should be directly connected with the growth of the timber resources in question.

Box 2. Comparison of forest land classification across SEEA 2003 and SEEA 2012

In contrast with the previous version of SEEA where forest land was classified according to its availability for wood supply, SEEA 2012 indirectly acknowledges that forest land should be regarded more broadly, and not only in terms of its availability for wood supply. Furthermore, this latest version of SEEA follows the indications of FRA 2010 where special attention is devoted to timber resources outside the forest. This recognition of timber in other areas provides with additional arguments for a separated accounting (although related to a greater extent) for timber and wooded land.

<table>
<tr><td colspan="6">Forest Land</td></tr>
<tr><td colspan="4">SEEA 2003</td><td colspan="2">SEEA 2012</td></tr>
<tr><td colspan="3">Forest Available for Wood Supply (FAWS)</td><td rowspan="2">Forest Not Available for Wood Supply (FNAWS)</td><td colspan="2">Naturally Regenerated</td><td rowspan="2">Planted forests</td></tr>
<tr><td>Natural</td><td>Semi natural</td><td>Planted</td><td>Primary</td><td>Other Naturally regenerated</td></tr>
</table>

Finally, identical imprecision remains for other wooded land across the two versions of SEEA.

2.1.2 Conclusions of the first task

SEEA 2012 is built on the classifications established in the FAO FRA2010 report. However, SEEA 2012 introduces some changes and slightly differs from SEEA 2003, which was using the FAO TBFRA 2000 definitions. For example, timber resources in SEEA 2012 are no longer so strictly attached to forest land. Rather, it accounts also resources outside of forest land. Still, these resources are divided to natural and cultivated, but this distinction in SEEA 2012 is country specific and better adapted to country's forest management particularities. Related to this shift in the timber classes, the forest land is no longer classified according to its availability for timber supply. These changes could be interpreted as a step forward to a more flexible classification where forests are considered in a broader sense and not only as sources of timber.

During the revision of SEEA 2012 some relevant issues were identified as lacking or to be improved. Developing methods for their inclusion in the accounting frameworks would surely improve the accuracy of the assessment on the contribution of the forest sector to the national economy. These are the following:

- Assessment of the recreational services provided by forests.

- Estimation of self consumption share for certain forest products. It would be relevant for disentangling the distribution of benefits from forests. In this sense, we are aware that the collection of information on the timber and non-timber forest products consumed by household would be rather challenging.
- Depletion of the resources in a broader sense, beyond the evaluation of sustainable yield. The way it is currently addressed is rather limited as it solely focuses on the concept of sustainable yield, which does not provide information about the quality of forest resources.
- Monetization of the resources. Physical accounts typically tend to be broader than monetary accounts, because of the difficulties attached to the estimation of the monetary value.

However, the underpinning objective of SEEA may not be to tackle all these issues, but rather providing general guidance and rising concern on the issues that may be relevant or challenging for future advances in accounting.

Nevertheless, some of the qualitative indicators proposed by SoEF may be appropriate for these purposes as they inform SFM from a nationwide perspective. To sum up, the overall goal would be informing depletion of forest resources more consistently, gauging the quality (and not only the quantity) of the forest resources by broadening the limited view of the sustainable yield concept.

2.2 Task 5.2

The aim of this study corresponds to the main objective of the second task in the Forest Accounts work package, which are:

- Exploring whether and how existing national data should be adapted to make them consistent with the proposed standards in SEEA forestry accounts.
- Proposing procedures that could be applied at the Member States or international level to make the existing data consistent with SEEA 2012 requirements.

For this purposes, a questionnaire was developed and submitted to statistical offices in particular in European countries, but also wider (e.g. Mexico, Canada). The intention of the questionnaire was to gather the statistical offices experiences with forestry accounts and the practitioners view on the SEEA 2012 methodology.

The questionnaire submitted to statistical offices consisted of two main parts and an explanatory document with detailed information about the issues addressed in the questionnaire (see Annex I). The first part of the questionnaire was aimed at compiling information about conducted forest accounting studies. . The second part compiled information on respondents' opinion about the feasibility of proposed improvements of SEEA 2012. In this part of the questionnaire we mainly used closed-ended-questions (e.g., yes/no responses, Likert scale). However, we also provided space where respondents could express their comments, ideas or suggestions.

The questionnaire was delivered by the end of January 2012 to statistical offices of a group of selected countries, most of them European.

In total, we collected responses from seven European (Austria, Finland, Germany, Netherlands, Norway, Spain[1], Sweden and United Kingdom) and four non-European countries (Canada, Guatemala, India and Mexico). Further, also Eurostat was asked to complete the questionnaire.
The first part of the questionnaire asked the countries to report on the different studies, if any, they may have conducted on forest accounts, in particular studies related to SEEA. This part also contained questions on user needs and purpose of the forest accounts.

The first deliverable of CREEA revised the upcoming SEEA 2012 and identified four main topics that we considered relevant for forest accounts that could be improved:

i. Forest land classification
ii. Forest related hazards and Forest management account
iii. Non-wood forest products
iv. Depletion and indicators to assess it

Therefore, the second part of the questionnaire intended to test how the proposed improvements were perceived by practitioners. For each of the proposed improvements it was asked whether they are considered as appropriate, important and feasible.

The questionnaire provided a brief description of each of the proposed improvements and a general statement where the experts had to express their agreement/disagreement level on a Likert scale. Additional space was provided so they could in addition provide comments, ideas or suggestions.

SEEA 2012 suggests that, because of increasing impact of hazards (e.g., storms, fires, diseases) on forests, the activities aimed to preserve and protect the environment from these events should be recorded. However, no additional guidance is provided in SEEA.

Thus, in CREEA we proposed a classification to report these activities, according to four hazard types: fire, storms, wind and snow, insects and diseases, and wildlife. Furthermore, the activities undertaken would be further classified according to the aspect they focused on: prevention, mitigation or restoration.

SEEA 2003 recommends establishing a Forest Resource Management Account where the expenditures in forest management would be recorded. This specific account would comprise among others, the following activities: forest management, pest control and regulation, afforestation including net acquisitions of land forest inventories, development of forests for recreational use, forest-related research, education, training and information activities.

The non wood forest products (NWFP) are a broad category of forest products (e.g., mushrooms, cork, berries) that are likely to represent a substantial source of income in many regions. However, there are important challenges in measuring the flow and the economic contribution of these goods. However, a common situation in many countries is that the share of this products collected for own consumption purposes account a high

[1] The information collected from Spain comes from the statistics department of the Ministry of Environment. The responsible didn't submit the questionnaire filled-in, but answered to key questions during the meeting held in Madrid with them to discuss about forest accounts in Spain. Furthermore, two Spanish researchers dealing with forest accounts were contacted and filled-in the questionnaire.

share (even higher than this traded in the markets). Our proposal in the questionnaire was to include a specific entry for NWFP within the SEEA to reflect their relevancy to the economy.

This last section of the questionnaire is devoted to the concept of depletion. SEEA 2012 assesses depletion of forest resources from the sustainable yield viewpoint. However, to properly assess depletion of resources, it is not only the quantity but the quality of these resources that matters. Hence, this section of the questionnaire gathers a list of indicators we proposed to enhance the assessment of depletion. The proposed list of indicators is based on State of Europe's Forest (SoEF) 2011 report.

2.2.1 Overall comparison of the answers with SEEA requirements

The SEEA 2012 forest and forestry standards set minimum criteria of what should be reflected in the forest accounts regarding mainly forest land and timber. The collected data from the questionnaire mainly intended to test whether respondents find the proposed improvements on SEEA 2012 feasible.

In this respect, the first question in Part II proposes an improvement on the SEEA forest land classification. This classification divides the forest land into naturally regenerated and planted forest. The proposed improvement would introduce a more detailed classification, which also differentiates between conifers, broadleaves, mixed and bamboo forests. Most European countries stated they would find it difficult to apply the proposed classification as they mainly apply IEEAF forest land classification. Thus, applying the proposed classification would impose an extra burden.

However, the proposed SEEA classification may prove to not be so difficult to apply. Firstly, most EU countries have only a very limited amount of primary forests, and would only have to report according to the categories "other naturally regenerated forests" and "planted forests". In this respect, most countries keep data about planted forest areas, (either in public forest or through permissions and afforestation projects on private land) the compilation of such data might not be so demanding.

On the other hand, some of the SEEA (either 2003 or 2012 version) proposals, (e.g., such as the establishment of an account on hazards, and account on forest management), seem to appeal more and gain the interest of the countries. However, reluctance is mainly triggered by the lack of specific data, double counting risks, high burden and resources needed to compile such data. Probably these are also the reasons why these accounts or initiatives are specified rather vaguely in the SEEA.

2.2.2 Conclusions of the second task

Six out of eleven surveyed countries reported that they had either ongoing studies or had done pilot studies. There is no international common forest policy or other legislation that would define the content of forest accounts. Thus, mainly the forest accounts related studies are conducted to provide the information for the Eurostat's IEEAF framework, which is done on a voluntary basis.

The surveyed countries also show reluctance to adopt and implement some of the proposed forest account classifications. Mostly this was because of lack of data. The

countries consider that the collection of adequate data would require a disproportional amount of resources, compared to the importance of the forestry sector.

This reluctance was also expressed when asked about willingness to adopt the proposed SEEA forest land classification. SEEA 2012 abandons the division of forests according to forest's availability for wood supply (Forest Available vs. Not Available for Wood Supply (FAWS/No FAWS).and Instead, it classifies forest land on hand of the regeneration process (naturally regenerated vs. planted). In contrast, Eurostat maintains the FAWS classification currently applied in the IEEAF accounting framework. European countries stick to it and hence, they don't seem to be willing to move to the new classification proposed by SEEA.

Nevertheless, some of the CREEA proposals, such as establishing an account on forest hazards, a forest management account or considering forest use were regarded as interesting. However, before implementing such improvements, adequate solutions would be needed to avoid double counting.

The forest sector and forest ecosystems heterogeneity within the EU is clearly reflected in countries responses related to non-wood forest products (NWFP) and other-wooded-land (OWL). Interest on establishing this type of accounts was mainly related to the importance of this topic in the addressed countries. For example, NWFP are considered relevant in Finland, where even estimates on self-consumption exist, while; UK considers NWFP as very marginal. Thus, we can conclude that the heterogeneity of forests and the forest sector is also reflected in their needs and preferences for a forest account framework. A possible solution could be to establish a common forest account framework that could embrace the multiplicity and account for the diversity of situations, i.e. it would be better to have some gaps in the accounts because some countries do not find it relevant to report on some aspects than having misreported situations.

Finally, to make a forest account framework more operational concise definitions for indicators are needed, to facilitate their adoption and implementation.

2.3 Task 5.3

The overall objective of this third and last deliverable is to test the data gathering process for building–up the SEEA tables. It implies:

- Testing the availability of data and accessibility to data information
- Drawing the general map of where the data comes from
- Evaluating the usefulness of the accounting framework proposed by SEEA to describe changes in the forests in the case studies
- Establishing a comparison across countries/regions in terms of availability of data, difficulty in data gathering or sources of information…

The aim of the deliverable was testing at least two case study regions/countries where the SEEA 2012 framework and the proposed improvements could be tested. The selected case studies are Catalonia (Spain) and Sweden.

Sweden is where the seat of Statistics Sweden, one of the partners working in the forest accounts work package. Furthermore, Sweden is a country where forests and the forestry

sector are highly relevant in terms of the forest area and the significance of their forest sector, respectively. Therefore, its relevancy well justifies its inclusion in this study.

Catalonia is one of the 17 autonomous communities of Spain. In Spain the forestry competencies belong to the communities and these are responsible for developing their own forest policy (under the umbrella of the National forest policy) and for collecting all the data on the forestry activities that take place in the region. Only the National Forest Inventory has a nation-wide scope and it is undertaken and funded by the Ministry of Environment. The inclusion of Catalonia, and not the whole country, is therefore justified as the regions are the primary source of data for forest related activities.

This deliverable is still "under construction". However, some of the main findings are:
The possibilities of establishing comparisons across our two case studies are difficult because of the lacking information to fill-in the tables but also due to the different assumptions that had to be made in setting the boundaries for the accounting classes. These assumptions differ between the two case studies; as SEEA states, countries have to set their own boundaries (for example between cultivated and natural) in accordance to their own situation. And because these differ importantly between Nordic and Mediterranean countries, no clear comparison can be established. This is partly also due to the problems encountered in dealing with the SEEA terminology and adapt the SEEA classes to the information that is available from the case studies. From the case studies' experiences it seems that the SEEA accounting framework, because it is focused on forest land and timber, seems very well suited to monitor the situation in countries where timber resources are highly relevant and maybe under risks or threats of deforestation/degradation. Linked to this, it seems also very suited to monitor these cases where the forest land is also under dramatic changes, i.e. land use changes towards agricultural and urban land. However, when dealing with forest areas where timber is not the main product obtained from the forests, as it is the case in Mediterranean forests, overlooking non-wood forest products produces an undervaluation of these forests, which is one of the aspects that environmental accounts try to overcome. Hence, for these countries/regions the environmental accounts might be not so appealing if the provision of non wood products is not considered.
The timber physical accounting table in SEEA 2012, differently form the previous version and also differently from the IEEAAF, records volumes of timber. This change can be interpreted as a willingness to consider forest land separately from timber, what might represent a first step in considering forest accounts further beyond timber. However, establishing an account on timber volumes proved to be a difficult task. Most of the times we can rely on NFI data on average m3/ha or similar, what would represent a plausible proxy to calculate these quantities. However, when dynamic changes such as forest fires or wind storms produce dramatic changes in the volume of standing timber, these can hardly be reflected into the accounts as records are kept of the areas affected but not of the standing volumes. However, if such a timber accounts is to be maintained, a more informative way of presenting it would be monitoring the age classes (or diameter classes) of the main species. As the Swedish case study shows, such an approach would allow to get a better picture of the situation the stands and their long term sustainability, e.g., the lack of mature old trees in Catalan forests due to the selective timber extraction in the old days.
One of the added values of the forest accounts would be expressing in monetary units the value of what is already there. When the resources are presented in monetary units that could be readily understandable for policy makers and can raise concern on the

values of these stands or how some policies may favour achieving more valuable forests, e.g. letting the mature trees to be more abundant in the stands . However, the translation of physical units into monetary ones is far from being straightforward. Finding stumpage timber prices is almost impossible due to the lack of reliability of these estimates, what shows that timber trade is many times lacking of transparency.

The SEEA Central Framework (SEEA CF) discusses the issue of cultivated vs natural[2]. There seems to be an underlying implication that it should be possible with existing data to differentiate between planted or naturally regenerated forests, and whether a forest is actively managed or not. However, to our best knowledge, the existing data does not allow to make these distinctions for Swedish forests. Thus, to accomplish the requirements of the SEEA 2012 framework, new forest characteristics parameters would have to be included into the national forest inventory. Given the problems encountered, it is not easy to see how such parameters could be developed. Similarly, in the Catalan case study, a proxy was adopted to split the standing timber in these two classes. However, having a management plan doesn't guarantee that the land is actively managed.
We see a need to discuss the demand for that division. What is the underlying information and the questions that the system is aiming to answer? Is it aiming to create a more full data set for economic policy by pin pointing that the natural resources can be used more fully? Is there an underlying assumption that economically productive forests should be more prominent in the country's economic policies? It does not seem to be designed to answer questions about the state of the forest itself. Furthermore, the terminology is confusing for forest-related people and it doesn't contribute to bridge the gap between foresters and accountants.

[2] Section 5.353-5.357