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**SEEA Agriculture, Forestry and Fisheries:  
Summary of revisions implemented after the Second Global Consultation**

Prepared by the Food and Agriculture Organization of the United Nations and the United Nations Statistics Division under the auspices of the UN Committee of Experts on Environmental-Economic Accounting

## **SEEA Agriculture, Forestry and Fisheries**

### **Summary of revisions implemented after the Second Global Consultation**

15 February, 2016

#### **Background**

This document provides a summary of feedback, received through the second global consultation process, and offers a guide to the changes implemented in the revised draft of the SEEA Agriculture, Forestry and Fisheries (henceforth: SEEA Agriculture). This final SEEA Agriculture draft will be submitted as background document to the UNSC for adoption.

Over 30 comments were posted to the UNSD SEEA website. (A list of countries and agencies is presented in Annex 1.) The coverage of countries was reasonably broad, with particularly solid numbers of comments from the Americas and Europe, a few from Africa and fewer from Asia/Oceania.

Overall, comments received shared a strong appreciation of the SEEA Agriculture draft, with well over half of the comments providing useful specific technical and editorial feedback on both structure and coverage. As a result, revision changes were largely implemented through improved clarification of concepts, rather than by re-working the fundamental direction of the accounting approach proposed.

The final SEEA Agriculture draft and this document also reflect comments and suggestions received from the SEEA Central Framework Technical Committee (TC), serving as the SEEA Agriculture Editorial Board.

The revisions implemented in the final SEEA Agriculture draft are described in this document under five main headings:

- Structure and coverage
- Context and role of SEEA Agriculture
- Conceptual accounting issues
- Implementation issues
- Editorial / typographical comments

This SEEA Agriculture draft is a complete product, in that it fully addresses in scope and substance all comments received during the final second global consultation and feedback from the TC. Additional issues of consistency and coherency, both internally and in reference to relevant existing standards especially SNA and SEEA Central Framework, may remain. They will be addressed in the final SEEA Agriculture document through a review by the Technical Committee on the SEEA Central Framework on behalf of the Committee of Experts on Environmental-Economic Accounting (UNCEEA).

## Key issues

### 1. Structure and coverage of the SEEA Agriculture

#### 1.1 General structure and balance of chapters

**Feedback:** One comment received highlighted that the current five-chapter structure was not well aligned to the structure of other SEEA documents. More specifically, according to this comment, the inclusion of a specific chapter on implementation (Previous Ch. 5<sup>1</sup>) was not usual; the material on applications and uses would not commonly be so extensive or included up front (Previous Ch. 2); and, on balance, Previous Ch. 4 was very much longer than the other chapters, and hence a break up of this chapter might be appropriate.

**Response:** The structure of the consultation draft had been based on the inclusion of material requested by various respondents through the development process. Based on this feedback the following broad structural changes were implemented in order to remain as aligned as possible to existing SEEA documents.

- Previous Chapter 5: Compilation and implementation was removed, but section 5.2 on tiered approaches to implementing accounts was retained and moved to Chapter 1: Introduction. Although alignment with other SEEA manuals is a driver for this change, it is also important to note that plans are underway for the development of a SEEA Agriculture Implementation Guide through 2016, and consequently the removal of material from Previous Chapter 5 should not be taken as implying a lack of concern for implementation (See additional comments on this point in section 4 below)
- Previous Chapters 1 and 2 were streamlined into a single chapter of about 20 pages, integrating material on the motivations and context for the work, the policy relevance and application and issues concerning implementation. Text concerning the scope and approach of the SEEA Agriculture was incorporated in the revised Chapter 2: Conceptual framework.
- Previous Chapter 4: Base accounts was divided into two chapters:
  - Chapter 3: Accounting for agricultural, forestry and fisheries production and associated biological resources, covering: (i) physical flows accounts for agricultural, forestry and fisheries products, (ii) asset accounts for biological resources and (iii) monetary flow accounts for agricultural, forestry and fisheries activities; and
  - Chapter 4: Accounting for environmental assets, primary natural inputs and residual flows covering (i) physical flow accounts for relevant natural inputs and residuals, and (ii) asset accounts for land, water and soil. Of itself this change does not imply any changes in the content of the previous sections in chapter 4.

The above changes are included in the new table of contents found in Annex 2 to this document. Annex 3 to this document provides a correspondence between the structure of the Global Consultation draft and the new draft to the UNSC.

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<sup>1</sup> Throughout this document, " Previous" indicates chapter numbers in the previous draft, i.e., the one that underwent the second global consultation, document "2GC\_Draft.pdf" dated 02/12/2015.

## 1.2 Incorporation of material on accounting in monetary terms

**Feedback:** A number of comments received indicated concern over the lack of material on accounting in monetary terms, thus underplaying the connections to the SEEA Central Framework and the SNA and also suggesting, at least implicitly, that accounting in physical terms may be appropriate and sufficient for the assessment of relative importance and the provision of policy advice.

**Response:** SEEA Agriculture is not intended to ignore or underplay the relevance of monetary information. Thus a number of additions to the text in various sections were implemented, as listed below.

Notwithstanding, it should be noted that the SEEA Agriculture is meant to complement the SNA and the SEEA Central Framework, rather than repeat. In particular, while there may be many issues in estimating the relevant prices and quantities of agricultural, forestry and fisheries products, the standard national accounting concepts concerning the monetary flows of these products, i.e. through supply and use tables, are well established.

Furthermore, accounting for the physical flows of these products within a national accounting setting is not as well established, thus the preferential focus of SEEA Agriculture on this area. Ultimately, it is the aim of the SEEA Agriculture to facilitate the integration of physical and monetary data for these activities, but without necessarily repeating existing guidance on compiling economic accounts for agriculture.

Based on the above clarifications, the following revisions were implemented:

- In Chapter 1 and Chapter 2, additional text was provided to explain the relative coverage of measurement in monetary terms, including in terms of the linkages to the SEEA Central Framework and the SNA 2008.
- In Chapter -2, additional text was incorporated into relevant sections (for example sections 2.3.3 and 2.4.8) to highlight the role that measurement and aggregation in monetary terms can play that is distinct from the role of measurement in physical terms.
- In the sections on asset accounts for biological resources (namely sections 3.4, 3.5, 3.7 and 3.9), additional text was introduced concerning monetary estimates with references to the SEEA Central Framework and the SNA 2008. Particular note will be made in relation to determining the valuation scope with respect to biological resources that are currently “non-economic” due to their location or costs of extraction.
- Text on the asset accounts for water, land and soil resources was introduced, to incorporate additional material on the valuation of these assets, linking to material in the SEEA Central Framework.
- In section 3.10: Base accounts for economic data, text was revised in order to better highlight the linkages between these data and the related data in physical terms.

**Additional feedback.** Some comments received on this topic included specific suggestions concerning the potential to include additional tables or additional rows /columns relating to monetary accounts within the current SEEA Agriculture tables.

**Response.** While conceptually the articulation of accounts corresponding to these suggested additional tables would be possible, two factors were considered against it. First, there are challenges in terms of aligning the activity perspective of the SEEA Agriculture with the ownership perspective inherent in the full sequence of accounts. Second, the articulation of these accounts is not fundamentally a task of integrated environmental-economic accounting, but rather a more detailed form of economic accounting. Consequently, such additional information would be more in scope for extended economic accounts for agriculture, rather than for the SEEA Agriculture. Thus no additional table was included.

Despite the above, it is recognized that some monetary flows in the sequence of accounts would be of relevance, for example, payments to extract natural resources (e.g. stumpage fees, fishing quotas), the purchase of rights to access water and the rent of land. Thus, revised text was incorporated in section 3.10 to highlight these flows and link to the relevant text concerning these flows in the SEEA Central Framework.

In addition, some additional rows/columns were incorporated in the SEEA Agriculture monetary tables, as follows:

Inclusions for **Table 3.10 (Monetary supply and use table for agricultural, forestry and fisheries products)** were:

- In the Supply table: inserted columns for taxes on products and trade & transport margins, and shifted column for subsidies on products to provide a clear bridge from total supply at basic prices to total supply at purchasers' prices.
- In the Use table: included a note in the text that a column for Government final consumption is not included, since the purchase of agricultural products by general government units will form part of their intermediate consumption as inputs to the production of government services.

Inclusions for **Table 3.11 (Extended production and income account for agricultural, forestry and fisheries activities)** were:

- New columns to show the intermediate consumption of water, energy, fertilizer and pesticides by agriculture, forestry and fisheries units in monetary terms (building on the suggestion in the text in paragraph. 3.188)
- New column to record Taxes less subsidies on production and imports
- New column to record gross fixed capital formation (GFCF) on cultivated biological resources as distinct from GFCF on other produced assets
- Two new columns to record changes in inventories with one column recording changes in inventories for cultivated biological resources.

The revised text furthermore notes that all of these additional items should be recorded in line with the treatments defined in the SNA.

In addition to these changes, an important area for revision was the representation of secondary production in these monetary tables, noting that such revision is covered below, under issue 3.2.

With reference to section 3.2 later in this document, we note that there are two broad types of secondary production that need to be considered to this end. The first is the production of agriculture, forestry and fisheries (AFF) products by non-AFF units, and the second is the production of non-AFF products by AFF units. The recording challenge arises in situations where a distinct local kind of activity units (LKAU) cannot be identified – and thus the following assumes that no distinct production/activity unit can be identified.

A central premise of the SEEA Agriculture approach is a focus on products – i.e. the aim is to link the production of AFF products to environmental stocks and flows. A starting principle, explained in 3.2 below, is to record physical flows of AFF products as exhaustively as possible.

This principle suggests that the scope of **Table 3.10 (Monetary supply and use table for agricultural, forestry and fisheries products)** should cover the supply and use of AFF products whether they are supplied by AFF units or supplied by non-AFF units. That is, the entire row of monetary supply and use tables should be included. To highlight this intended coverage, we therefore split the first column in Table 3.10 “Total output at basic prices” into two columns - output produced by agriculture, forestry and fisheries units; and output produced by other units.

In Table 3.11 on the other hand, the intention is to align to the total income earned by units whose primary activity is within the scope of agriculture, forestry and fisheries. The current structure of Table 3.11 reflects this already, although it may not be obvious. Thus the revised draft includes a clarification that the activities listed therein include support services and all other classes of ISIC Section A.

By contrast, no changes to Table 3.11 were made, in relation to recording secondary production. This is because, where the income of AFF units is earned from the production of non-AFF products, this will be included, inseparably, in the measures of income and value added included in Table 3.11. Where this income can be separated, then it implies that a distinct LKAU can be formed and thus that the income and production should be recorded in a different ISIC section.

### **1.3 Inclusion of material on environmental activity**

**Feedback:** A number of comments received suggested incorporation of additional tables concerning environmental protection (EP) and resource management (RM) activity for agriculture, forestry and fisheries. At present, the only text relating to these activities is in Section 2.1.3 on Potential extensions.

**Response:** No additional tables were included on these topics, for the same reasons outlined in Section 2.1.-3 above, i.e., that there is little additional framework design that the SEEA Agriculture can add that is not already captured in the SEEA Central Framework or the SNA.

### **1.4 Inclusion of information on energy supply**

**Feedback:** Comments received from countries suggested that it would be appropriate to incorporate information on the production of energy products and the contribution to energy supply by agricultural units, including for their own-use.

#### **Response**

A detailed discussion on the inclusion of energy supply, stimulated by this comment and with participation of the SEEA CF TC, supported the decision not to include an energy supply table in the SEEA Agriculture. The main issue concerned the approach to the recording of energy products in standard energy statistics and in the associated SEEA energy accounts. For these statistics, the contribution of agricultural and forestry products to the production of energy, i.e. via biomass, is not attributed to agricultural activity but rather is considered a direct input from the environment to the industries that produce the associated energy product, e.g. biofuel. This arises as there is no standard energy product in the classification that can embody the energy and hence be transformed.

Further, in measuring energy supply from the perspective of agricultural units, it is necessary to also consider cases where the units produce energy themselves as a secondary activity. For example, agricultural units may produce solar energy for own use or earn an income through allowing wind turbines to be located on farming land.

In light of these findings, the revised version, while not incorporating an additional table recording energy supply, includes additional text in order to:

- Recognise that the production of energy products (e.g. electricity) by agricultural units – either for own-use or for use by other units – is within the scope of energy statistics and the energy accounts of the SEEA Energy
- Recognise that the currently proposed physical flow accounts for crops and forest products already incorporate columns in the use tables to record the tonnes of output that are used in the generation of energy products. This information should give insight into the relative significance of the use of agricultural and forestry products

for energy supply. The information may be converted to joules as necessary for analysis.

- Incorporates additional columns in the energy use table to record information, as available, on whether the source of the energy was own-account production. To this end “of which sourced from own-account production” columns was introduced under the current totals for energy use by agriculture, forestry and fisheries. Care will be needed here in understanding the associated issues of defining LKAU and secondary production.

### **1.5 The scope of SEEA Agriculture with respect to the supply chain for products from agricultural activities**

**Feedback:** Some comments indicated an interest in extending the accounting of the SEEA Agriculture to explicitly incorporate the full supply chain that emerges from agricultural production, thus incorporating connections to manufacturing, transport, storage, wholesale and retail activities. Some suggested incorporating a full input-output table type presentation.

**Response:** It is not the intent of the SEEA Agriculture to incorporate accounting for all data that may be relevant for the assessment of agricultural, forestry and fisheries activities. The chosen focus is on integration of environmental information with information on the production of agricultural products, following the scope of the SEEA Central Framework.

At the same time, by using the SEEA as the basis for this integration, the potential for the extension of these data to economy-wide analysis is strong, since input-output and economy-wide accounts are also based on the concepts of the SNA. Thus no changes or extension to the SEEA Agriculture are proposed in relation to this issue.

Revised text was therefore introduced, to clarify that compilation of the type of information within scope of the SEEA Agriculture will enhance the measurement of environmental footprints along the agri-industry supply chains, including food, clothing, wood products, etc.

### **1.6 Extended ecosystem accounts**

**Feedback:** A number of comments asked for recognising more extensively the potential of ecosystem accounting, as described in the SEEA Experimental Ecosystem Accounting, to be connected to accounting for agricultural, forestry and fisheries activities.

**Response:** It is clear that there is growing interest in ecosystem accounting and the conceptual and policy links between ecosystems and agricultural activities are becoming increasingly understood. The TEEB for Agriculture and Food is a good example of advances in this direction. Given the conceptual development of ecosystem accounting, in principle it would be possible to incorporate the key elements of ecosystem accounting into the SEEA Agriculture framework.

However, given that ecosystem accounting is still a developing field of measurement and that the broader intent in the SEEA Agriculture is to encourage countries to integrate generally available environmental and economic data, it was considered appropriate to exclude ecosystem accounting from this revised SEEA Agriculture document.

At the same time, and given the strong interest and policy relevance, revised text was introduced to recognize, as a priority on the SEEA Agriculture research agenda, the need to build applications of ecosystem accounting to agricultural, forestry and fisheries.

### 1.7 Inclusion of more discussion on indicators

**Feedback:** Some comments requested additional discussion on indicators, especially in relation to the definition of indicators for the monitoring of the Sustainable Development Goals (SDGs).

**Response:** The current discussion on indicators was retained, in line with the extent of discussion on indicators in the SEEA Central Framework. At the same time, additional paragraphs were added for increased clarification, to better describe the potential of accounting frameworks, and the SEEA Agriculture in particular, to contribute to the development and measurement of SDG indicators.

It is anticipated that a longer discussion on indicators will be included in the planned SEEA Agriculture Implementation Guide. Since the development of this guide will take place following the adoption of the SDG indicators and of the SEEA Agriculture, it will be possible to appropriately direct discussion and measurement support.

### 1.8 Other issues of structure and coverage

A range of smaller issues were raised through the consultation process. These issues and the proposed response are listed below.

- (i) Inclusion of tables for other inputs, especially for livestock and aquaculture production – e.g. vets, fodder, medicines, etc.

Generally, these inputs are not environmental in nature and hence not the focus of the SEEA Agriculture. Information on fodder is recorded in the physical flow account for crops. No change was implemented.

- (ii) Inclusion of a land account change matrix.

The compilation of such a matrix is discussed in the SEEA Central Framework. Revised text makes a reference to this possibility.

- (iii) Inclusion of carbon accounts.

While there are very strong connections to stocks and flows of carbon through agricultural, forestry and fisheries activities, accounting for carbon is not a focus of the SEEA Agriculture. Carbon accounting is discussed in the SEEA Experimental Ecosystem Accounting and interested compilers should use this document as a starting point. Revised text was introduced to highlight where information compiled for the SEEA Agriculture will be relevant in developing carbon accounts, including in connection to GHG emissions from land use, land use change and forestry (LULUCF).

- (iv) Information on environmental impacts and residual flows.

The measurement of overall changes in the state or condition of environmental assets is not the focus of SEEA Agriculture. This is also the case for the SEEA Central Framework. There will be some assessment of state/condition that will be reflected in changes in relevant environmental assets (e.g. changes in forest areas, soil resources, etc.), but additional data on for example air and water quality have not been developed. This topic of directly assessing ecosystem state and condition is the focus of SEEA Experimental Ecosystem Accounting. At this stage, no additional text was



introduced on this topic, however appropriate links were identified in the discussion of ecosystem accounting.

Another means of understanding the connection between economic activity and the environment is to measure environmental pressures. This may be of particular interest in determining appropriate policy responses, since a reduction in environmental pressures will likely be connected with improvements in environmental state. Accounting for environmental pressures is a key aspect of the SEEA Agriculture and the SEEA Central Framework.

In the SEEA Agriculture, the environmental pressures included are GHG emissions, water abstraction, land use change and flows of nitrogen and phosphorous. Accounting for additional environmental pressures (e.g. flows of solid waste and ozone depleting substances) was not introduced, although new revised text notes that extended accounting for such flows can take place, following the general advice in the SEEA Central Framework and the SEEA Agriculture.

In general, it was felt that the various accounts of the SEEA Agriculture and the coverage of topics van already provide a broad information set in support of a broad analysis of environmental driving forces, pressures, states, impacts and responses.

(v) Information on the externalities of multiple/competing land uses.

One comment requested additional information for the assessment of externalities that arise when there are competing land uses, e.g. between agriculture and mining. Generally, the analysis of trade-offs between different land uses is hardly an application of accounts, since it requires the comparison of scenarios rather than a recording of actual stocks and flows. With respect to land use, the information in the land use account described in the SEEA Agriculture may provide a useful basis for understanding the overall significance of competing land use, but it is likely that more detailed, mapping based approaches would be required.

(vi) Inclusion of information on regional / sub-national reporting approaches

One comment suggested that it would be positive to include advice on standard approaches towards the organisation of sub-national data, for example using the NUTS classifications applied in Europe. At this stage, while the potential benefits of sub-national agricultural statistics are recognised, no standard approaches in this area have been incorporated. This topic may be considered further in the proposed SEEA Agriculture Implementation Guide, taking into account that sub-national data may be of more relevance for some data domains compared to others.

(vii) Inclusion of a glossary

This proposal was accepted for inclusion in the proposed SEEA Agriculture Implementation Guide.

## 2. Context and role of SEEA Agriculture

**Feedback:** There were a range of comments that can be broadly summarized as seeking clarification on the context and role of the SEEA Agriculture. In the following aggregated response section, the different comments/issues are noted, followed by specific responses.

### **Responses:**

- (i) The extent to which SEEA Agriculture can be considered a standard reporting framework:

The consultation draft made it clear that the tables presented in the SEEA Agriculture are conceptually based. They do not reflect agreed reporting tables for the standardised collection of data at international level. If there is agreement to collect standardised data from countries following the SEEA Agriculture, data reporting tables will be separately proposed and discussed with countries. The draft was reviewed to ensure this message is consistently presented.

- (ii) Links to other projects and groups, especially with respect to implementation

The Preface was revised to ensure appropriate mention of the links to other relevant projects and groups. Feedback received indicated that this should take into account the links to the Global Strategy to Improve Agricultural and Rural Statistics, links to the advancement of national statistical systems and the recognition of industry associations as both important users of information and data owners. These linkages will be explored further in the proposed SEEA Agriculture Implementation Guide.

- (iii) Role of combined presentations

In general, there seemed to be a good understanding of the role of combined presentations. At the same time, in view of specific comments received, the following revisions were made:

- Grouped the combined presentation currently in the Previous Chapter 5 with the other combined presentations in the Previous chapter 3 in revised Chapter 2 (2.5 SEEA Agriculture combined presentations)
- ensured a clearer connection is made between the structure of combined presentations and the application of the tiered approach to compilation
- explained expectations with respect to the compilation of accounts and combined presentations, including the potential for an initial focus on aggregate data and the progressive inclusion of more detailed information.

### 3. Conceptual accounting issues

This section describes proposed responses to a number of conceptual accounting issues. The issues listed here do not affect the fundamental logic of the SEEA Agriculture, but point to the need, in some areas, for additional clarification and the recognition of specific issues about recording agricultural, forestry and fisheries activity.

In addition, a number of comments highlighted parts of the text in which the language and terminology used was either inconsistent in different parts of the document, or inconsistent with discussion of the same issues in the SEEA Central Framework or the SNA. Such inconsistencies were not intended. As a general response, these inconsistencies were removed based on analysis of the comments received.

#### 3.1 The treatment of secondary production, own account production and intra-unit production

**Feedback:** It was highlighted through a number of comments that there was a lack of clarity on the treatment relating to the recording of specific types of production: secondary, own-account and intra-unit.

**Response:** Indeed, feedback received highlighted that there are important connections and overlaps between these different types of production. Overall, greater clarity and consistency was provided through appropriately revised text.

A useful starting assumption for the development of accounts is that each individual production unit, generally referred to as a LKAU, produces only one type of product, e.g. milk, and has a set of accounts that cover the output, intermediate consumption and other transactions related to that production. In practice, this assumption doesn't hold for many reasons and hence it is necessary to consider the appropriate recording and treatment. Sections 2.4.2 – 2.4.5 of the consultation draft discuss the relevant issues.

Improvements to those sections were implemented, recognising that it will be necessary to ensure, during final consistency checks prior to final publication, that these treatments are consistently reflected in the description and structure of the base accounts, including in the summary section of physical flow accounts in sect.2.3.2. Revisions included:

- Adopted a starting principle that the recording of physical flows should be exhaustive
- Recognised and explained the difference between this scope of recording for physical flows and for standard recording of monetary flows, especially with respect to the recording of intra-unit flows. This discussion explains the links to the scope of recording for own-account production compared to the SNA.
- In sections 2.4.2 and 2.4.3, introduced a discussion on the situation where agricultural products are used within an agricultural unit to produce non-agricultural products – e.g. milk is used to make cheese.
- Clarified in section 2.4.5 the scope, with respect to the inclusion of agricultural products produced by non-agricultural units - see also text under 1.2 above.
- Clarified in section 2.4.5 the scope with respect to the inclusion/exclusion of non-agricultural products (covering processed products and also distinct products activities such as energy production and tourism) produced by agricultural units.
- Ensured discussion of these issues in the context of forestry and fisheries in addition to agriculture
- Clarified the links to the recording of inputs (e.g. water, energy) with respect to the scope of products/activity included in the accounts. It seems likely that the estimates of total input use will relate to the entire production of the unit, not only the primary activity, although the potential to report on input use specifically relating to individual products should be retained.

### 3.2 The treatment of waste and losses including food waste

**Feedback:** A number of comments raised concerns about the discussion of waste and losses, including food waste, and pointed to inconsistencies or at least to a lack of clarity in the treatment for agriculture compared to forestry and fisheries.

**Response:** The comments on these issues were well articulated and related to a complex, and often confusing issue in accounting. Indeed, the treatment of losses remains an important issue for discussion in the context of the SEEA Central Framework. The following improvements were implemented:

- Clarified that the treatment of losses outlined in the SEEA Central Framework also applies in the SEEA Agriculture and explain this treatment. In particular, clarified that the definition of losses, including food waste, does not imply direct release to the environment but rather that the product is no longer required by the user or owner.
- Clarified that, in line with the scope of SEEA Agriculture being limited to agricultural products, there is no intention to track losses through the supply chain. In particular, clarified that the inclusion of food waste in the context of household consumption is an “of which” item, rather than representing the result of a supply chain accounting exercise.
- Recognised the need for further discussion and research to determine treatments of crop residues and other unused biomass from agricultural activities

### 3.3 The description and treatment of flows relating to forest products including the treatment of bark

**Feedback:** A number of comments indicated that the explanation of the flows of products in the physical flow account for timber products and the associated figure 3.5 needed greater clarity in both terminology and concept.

**Response:** The description of the flows relating to forest products is a challenging one, as there are multiple layers to the product descriptions which are adopted at different levels in different countries. The intention was to remain consistent with the generally agreed classifications underpinning forestry statistics, while at the same time integrating these data within a supply and use context. With these aims in mind, the following changes/clarifications were made with respect to Table 3.5 “Physical flow account for timber products, Figure 4.1 Forestry concepts and the associated text in Section 3.6.

- The term “growth in standing timber” was replaced with the term “Net annual increment”. This measure is in fact reflective of the net annual timber increment which differs from the volume of standing timber. (See SEEA Central Framework 5.352 for details).
- The product “net annual timber increment” was specified as the primary output of those units classified to ISIC 021. The use of the net annual timber increment was allocated to logging activities (ISIC 022). The main output of logging activity (ISIC 022) is the product “roundwood”.
- It was considered relevant to connect the production of roundwood to flows of gross fellings, felling residues and removals (where gross fellings less felling residues equals removals) and then whether the removals are measured over (i.e. including) or under (i.e. excluding) the volume of bark.
- Roundwood can be disaggregated in a number of ways. A distinction was made between industrial roundwood (or wood in the rough) and wood fuel, including wood for charcoal. Industrial roundwood may then be split into logs, pulpwood and other.

With these distinctions in mind, the following revisions were introduced:

- Recognising also that felling residues and bark may be used to generate other wood products (e.g. wood pellets), we re-oriented Table 3.5 in rows – as shown in the table below.
- Generally, production of these products is now recorded against logging activity (ISIC 022), although it is possible that these products are produced by other industries, for instance in situations of vertical integration or by units whose primary activity is agriculture.
- Use categories were aligned such that the supply recorded in each row in the new format has a corresponding use item. The exception being that there will be no use entries corresponding to the proposed rows for “Gross fellings” and “Felling residues (not removed)”. Note that felling residues that are removed will have a corresponding use entry if information is available.
- Furthermore, use columns were added to record situations where roundwood is used directly in land improvement and related work, thus representing gross fixed capital formation.
- New revised text was introduced to explain the flows through the supply and use table as we move through the chain of products.

Amendments made to the physical flow account for forest products

	Forestry (ISIC 021)	Logging (ISIC 022)
Net increment in growing stock	X	
Gross fellings		X
Felling residues (not removed)		X
Removals – Roundwood (over bark)		X
Bark		X
Removals – Roundwood (under bark)		X
Roundwood		X
of which Industrial roundwood (wood in the rough)		X
Wood fuel,		X

Note that the “of which” items may be included to the extent that information is available and are not intended to reflect a complete disaggregation of the corresponding total.

Flows of forest products are measured in cubic metres. On the treatment of non-forestry or logging activities, support services to forestry (ISIC 024) were considered out of scope of the physical flow table, since there are no natural physical indicators of this output, and, following the current text in section -3.6.3, the gathering of non-wood forest products (ISIC 023) was recorded in its own physical flow account (modelled on the physical flow accounts for crops or livestock), whenever the production of these products is considered significant or of policy interest. The production of both of these activities (ISIC 023 & 024) should be included in the scope of the monetary accounts of the SEEA Agriculture.

### 3.4 Clarification of measurement boundaries for GHG emissions with respect to SEEA and IPCC

**Feedback:** Some comments observed that the description of accounting for greenhouse gas (GHG) emissions seemed to reflect IPCC measurement approaches and were concerned about the alignment with the measurement boundaries required in a SEEA context.

**Response:** While it is the case that the detailed description of GHG emissions has emerged from work at the FAO on the estimation of GHG emissions from agriculture, itself based on the IPCC guidelines, it is also the case that the conceptual measurement boundaries for GHG emissions with respect to agriculture are highly aligned between IPCC and SEEA. Nonetheless, the specificity of the land sector in term of emissions accounting, requires a deviation from standard SEEA Central Framework air emission accounts, in a way that brings SEEA Agriculture closer to the IPCC guidelines. The following changes were introduced in order to better clarify such approach:

- Excluded “Emissions from electricity” from scope of emissions from agriculture recognising that, following the SEEA, these are attributable to the electricity industry
- In the description of manure left on pasture, we removed the distinction between direct and indirect emissions. The interpretation of “direct” and “indirect” in a SEEA context is different from the IPCC and in fact, all of the emissions described as being within scope of this category are conceptually within scope of the SEEA Agriculture
- Removed non-AFF industry detail from emissions table (i.e. combine into an “Other industries” column)
- Introduced text to explain the link between the LULUCF measurement boundary and the SEEA treatment, with reference to IPCC guidelines and SEEA Central Framework 3.240-3.243. Text describing differences between IPCC land use categories involved in GHG estimation and SEEA was added for clarification, highlighting specific differences from the SEEA Central Framework and their implementation in SEEA Agriculture.

### 3.5 Clarification of classes of land

**Feedback:** Some comments raised concerns about the classes used to classify land use in Table 4.17. These concerns related to classes including land used for maintenance and restoration, inland waters, forestry, use of built up areas and land not in use.

**Response:** The land use classes used in the SEEA Agriculture align to the classes defined in the SEEA Central Framework and this logic for these classes is explained in the SEEA Central Framework. However, it is accepted that both the general definition of land use and a reference to the SEEA Central Framework are not provided in the draft SEEA Agriculture. Consequently, additional text was included to ensure that a clear connection to the SEEA Central Framework is made.

In addition, recognizing that land use and land cover classifications of the SEEA Central Framework are interim in nature, and noting the strong links between agriculture statistics on land use, the FAO/FRA data collections and the estimation of IPCC based emissions, two labelling changes were introduced, to clarify better the intent in the land use classification by using the labels “Land used for agriculture” and “Land used for forestry” rather than only “Agriculture” and “Forestry” in the Land use account.

New revised text further notes that additional work on clarifying the precise links between the different approaches to land classification is needed, and that this research item will have a high priority on the SEEA Agriculture research agenda. Specific practical guidance will be included in the SEEA Agriculture Implementation Guide, including on bridging between the different classifications.

### 3.6 The treatment of stocks and flows associated with soil water

**Feedback:** There have been differing views concerning accounting for soil water. Some comments received indicate that the measurement challenges associated with soil water are too great for it to be considered within scope. Other comments were concerned that there is little policy relevance. A final group of comments, while recognising the measurement challenges, felt that the inclusion of soil water was needed to gain a more complete assessment of water use in agriculture.

**Response:** There is no doubt that there are significant challenges associated with measuring soil water. However, for those countries that are subject to regular drought and water stress, there is clear policy interest in linking information on soil water with information on water abstracted from other sources.

Given the policy relevance in a range of countries, and the inclusion of soil water in the scope of the SEEA Central Framework, it was considered relevant to include stocks and flows of soil water within the scope of SEEA Agriculture. The following clarifications were made in the revised text:

- The measurement of soil water should be based on a clear policy demand within a country, and estimates should be compiled consistent with the general SEEA implementation guidance of adopting flexible and modular approaches to the compilation of accounts.
- It should be recognised that estimates of stocks and flows of soil water will require some degree of modelling and assumption and close involvement of experts in this area. There are only a limited number of examples of statistical agencies compiling estimates of soil water but, more broadly, measurement techniques are available that may provide a starting point for accounting purposes.
- The accounting linkages between recording flows of soil water, the abstraction of water for irrigation and precipitation need to be clearly articulated to ensure there is no double counting of abstraction.
- Accounting for soil water should be included on the SEEA Agriculture research agenda, alongside research on accounting for soil resources.

### 3.7 The structure of the accounts for water resources

**Feedback:** A number of comments raised concerns about the structure of the physical supply and use tables for water resources, in particular highlighting differences from the structure of the related table in the SEEA Central Framework. A related concern was that the physical supply and use table seemed to have too detailed a coverage of non-agriculture, forestry and fisheries industries, and it was proposed that the structure of the tables should focus more heavily on agriculturally specific flows.

**Response:** In view of the clear feedback in this area, the structure of the physical supply and use table for water resources was reworked, in order to better align with the related table in the SEEA Central Framework and, at the same time, ensure clear focus on the organisation of information most relevant from an agriculture, forestry and fisheries perspective. The updated version of the table is presented in Annex 4 to this document.

The text in section 4.2 was updated to reflect these changes to the table and incorporate some more specific suggestions received through the second global consultation, including clarifying the treatment of household abstraction of water and the recording of wastewater.

### 3.8 Other conceptual issues

**Feedback:** There was a range of other comments on conceptual issues that may generally be considered less significant in an overall context, but which are important for the SEEA Agriculture to deal with. In the following, the different comments/issues are noted followed

by the proposed responses. Relevant changes were made to sections of the text to clarify these issues.

### **Responses:**

#### Treatment of harvest from the wild, including capture from hunting and recreation

There are a number of aspects concerning the recording of the harvest of natural biological resources (i.e. plants and animals whose growth is not managed by economic units). These aspects, listed below, were clarified in relevant places in the final version of the SEEA Agriculture, as follows:

- Where harvest of natural biological resources is undertaken as the primary or secondary activity of an economic unit (e.g. hunting, open sea fishing, logging of natural timber resources, gathering non-wood forest products (mushrooms, berries), the associated production should be included in the SEEA Agriculture. Note that, following ISIC, hunting and trapping activity is included as part of agriculture (ISIC Division 01), while the gathering of non-wood forest products is a distinct activity within Forestry and logging (ISIC Division 02).
- Consistency of treatment between products, including bush meat, honey, furs, skin, etc., which may all be obtained from natural biological resources.
- Where the harvest of natural biological resources is undertaken by households for their own consumption, this should be included in the relevant accounts (e.g. physical flow account for fish products).
- Where the harvest relates to animals captured and killed through sport and recreational activities, these are considered to be outside the scope of SEEA Agriculture since, in line with ISIC, these activities are not considered primary to agriculture, forestry and fisheries. At the same time, if the physical flows of these biological resources are considered significant, relevant estimates may be incorporated as addendum items in the relevant tables.

#### Treatment of illegal production

Following the SNA, illegal production (e.g. poaching of elephants for ivory) is considered inside the production boundary of the SEEA Agriculture. In these instances, the harvest of the product should be recorded in the relevant physical flow account and associated income included in the monetary supply and use table. Depending on the product, it may be necessary to incorporate additional rows to the supply and use tables to facilitate recording this production.

#### Treatment of medicinal products

The recording of harvest of cultivated and natural biological resources for use in medicinal products is within scope of the SEEA Agriculture. Taking into account the general comments above, concerning the harvest of natural biological resources, the scope of the SEEA Agriculture is not limited by the intended use of the products that are harvested. While the use of agriculture, forestry and fisheries products for food, fibre and fuel may represent the predominant uses, other uses may also be recorded. It is noted that additional rows may need to be incorporated into the relevant supply and use tables to highlight those products being harvested primarily for medicinal purposes.



## Lists of products

A number of comments received highlighted that in the structure of some tables, particularly relating to crops, the selection of products did not include some products of particular significance in specific countries. The current text explains that the selected list of products in the SEEA Agriculture tables is indicative only, and that countries should determine the list of products that is most appropriate in their circumstance. Where necessary additional clarifying text was inserted.

## **4. Issues concerning implementation**

### **Introduction**

Many countries indicated their concern on the availability of information and the resources available to collect the relevant data and to compile accounts. These are legitimate concerns that are relevant not only in the context of new statistical standards, such as the SEEA Agriculture, but also in the context of long-standing statistics such as the national accounts. As with the SEEA Central Framework, it is not expected that countries immediately commit substantial resources to the compilation of SEEA Agriculture accounts. Rather it is proposed that implementation be flexible and modular, responding to both policy priorities within a country and available resources.

Notwithstanding these general statements, it is important that in the development of SEEA Agriculture, appropriate attention is paid to the issue of implementation. In line with other accounting standards, such as the SNA and the SEEA Central Framework, the coverage of the standard itself is limited to describing the relevant measurement scope, definitions, accounts and treatments. Guidance on data collection, accounting methods and implementation strategies are contained in other documents.

With this strategy in mind, the intention is to develop a SEEA Agriculture Implementation Guide, with drafting to progress through 2016. The intended coverage and key topics for this guide are listed below. It is anticipated that the preparation of this document will represent a positive and encouraging response to the various concerns around implementation raised by countries through the consultation process.

In addition, FAO as the lead agency for the SEEA Agriculture will be seeking opportunities to advance the testing and implementation of SEEA Agriculture in interested countries and also aim to work with other international agencies, for example UNSD and World Bank as part of their broader SEEA implementation efforts. This would include introducing modules on the SEEA Agriculture as part of country or regional SEEA training programmes.

## **Proposed contents of the SEEA Agriculture Implementation Guide**

### Approaches to implementation

Description of the tiered approach (building on current section 1.1.4)

Possible sources of resources and implementation support

Institutional arrangements and options

### Sources and methods

Sources and methods for different data domains -

Linkages to other relevant international processes

Global datasets

National datasets

Features of national accounting approaches (using current section 2.2)

Special issues in data collection

Identification of key products

Measuring illegal and non-observed activity

Measuring own-account production

The use of modelling (especially at product level)

Others

Applications and analysis (building on current text in chapter 1 and linking to SEEA Applications and Extensions)

### Supporting material

Description of SEEA Agriculture pilot country exercises

Description of current FAO and EU agriculture, forestry and fisheries collections (consider the development of bridge tables)

Discussion of data quality

Introduce examples and exercises linking to numbers in SEEA Agriculture accounts

## **5. Editorial / typographical matters and issues concerning tables**

Feedback from countries included a range of constructive editorial suggestions. The document will include these final editing issues after adoption, with a focus on the following:

- Introduction and application of SNA and SEEA Central Framework codes to be implemented in the SEEA Agriculture Implementation Guide
- Clarified/checked measurement units
- Application of darker/shaded cells in tables representing cells of less significance
- Inclusion of diagrams to improve the explanation of supply and use flows
- Improved explanation of data domains
- Improved approach to referencing supporting texts and documents
- Consistency in the labelling and description of combined presentations

**Annex 1: List of countries and agencies responding to the global consultation process**

<b>Country</b>	<b>Comment received</b>
Armenia	14-Jan-16
Austria	11-Jan-16
Bolivia	18-Jan-16
Brazil	11-Jan-16
Burundi	18-Dec-15
Canada	11-Jan-16
Chile	20-Jan-16
Colombia	08-Jan-16
Czech Republic	15-Jan-16
Egypt	28-Dec-15
Finland	02-Feb-16
FAO	18-Jan-16
Hungary	12-Jan-16
Indonesia	18-Jan-16
Iran	03-Feb-16
Italy	11-Jan-16
Jordan	18-Jan-16
Kuwait	12-Jan-16
Latvia	11-Jan-16
Lithuania	10-Jan-16
Mexico	08-Jan-16
Moldova	11-Jan-16
Netherlands	04-Jan-16
New Zealand	11-Jan-16
Peru	19-Jan-16
Poland	11-Jan-16
Portugal	12-Jan-16
Slovakia	11-Jan-16
Slovenia	11-Jan-16
South Africa	14-Dec-15
Sweden	12-Jan-16
Switzerland	08-Jan-16
UNSD	20-Jan-16
USA	18-Jan-16
Yemen	6-Feb-16

## **Annex 2: Revised Table of contents**

### **Contents**

#### **Preface**

Including

Development process

Links with other accounting frameworks

Related statistical documents and initiatives

#### **Acknowledgements**

#### **Acronyms used in the document**

#### **Chapter 1: Introduction**

1.1 SEEA Agriculture: The System of Environmental-Economic Accounting for Agriculture, Forestry and Fisheries

1.1.1 Overview of SEEA Agriculture

1.1.3 Motivation for the development of SEEA Agriculture

1.1.3 Potential beneficiaries of SEEA Agriculture

1.1.4 Expectations concerning implementation

1.2 Summary of uses and applications of the SEEA Agriculture framework

1.2.1 Primary uses of SEEA Agriculture data

1.2.2 Primary policy themes

1.2.3 Other relevant policy connections

1.2.4 Applications at the sub-national level

1.3 Structure of this document

#### **Chapter 2: Conceptual framework**

2.1 Introduction

2.1.1 Introduction

2.1.2 Main areas of focus and key features

2.1.3 Potential areas of extension

2.2 Basic national accounting principles

2.2.1 Introduction

2.2.2 Types of accounts

2.2.3 Main accounting rules and principles

2.3 SEEA Agriculture base accounts

2.3.1 Data domains

2.3.2 SEEA Agriculture physical flow accounts

2.3.3 SEEA Agriculture asset accounts

2.3.4 SEEA Agriculture other economic data

2.4 Accounting issues

2.4.1 Introduction

2.4.2 Scoping of products

2.4.3 Recording of intra-unit flows

2.4.4 Treatment of own-account production and use

2.4.5 Treatment of joint products

2.4.6 Treatment of secondary production

2.4.7 Treatment of natural and cultivated biological resources

2.4.8 Treatment of changes in inventories, losses and waste

2.4.-9 Issues concerning measurement units and aggregation

2.5 SEEA Agriculture combined presentations

2.5.1 Introduction

2.5.2 SEEA Agriculture combined presentations

2.6 Aggregates and agri-environmental indicators

2.6.1 Types of indicators

2.6.2 Role of SEEA Agriculture in supporting development and monitoring of indicators frameworks

### **Chapter 3: Accounting for agricultural, forestry and fisheries production and the associated biological resources**

3.1 Introduction

3.2 Physical flow account for crops

3.2.1 Measurement purpose and scope

3.2.2 Accounting entries

3.2.3 Measurement issues and possible extensions

3.3 Asset account for plantations

3.3.1 Measurement purpose and scope

3.3.2 Accounting entries

3.3.3 Measurement issues and possible extensions

3.4 Physical flow account for livestock products

3.4.1 Measurement purpose and scope

3.4.2 Accounting entries

3.4.3 Measurement issues and possible extensions

3.5 Asset account for livestock

3.5.1 Measurement purpose and scope

3.5.2 Accounting entries

3.5.3 Measurement issues and possible extensions

3.6 Physical flow account for forestry products

3.6.1 Measurement purpose and scope

3.6.2 Accounting entries

3.6.3 Measurement issues and possible extensions

3.7 Asset accounts for forests and timber resources

3.7.1 Measurement purpose and scope

3.7.2 Accounting entries

3.7.3 Measurement issues and possible extensions

3.8 Physical flow account for fish and other aquatic products

3.8.1 Measurement purpose and scope

3.8.2 Accounting entries

3.8.3 Measurement issues and possible extensions

3.9 Asset account for fish and other aquatic resources

3.9.1 Measurement purpose and scope

3.9.2 Accounting entries

3.9.3 Measurement issues and possible extensions

3.10 Base accounts for economic data for SEEA Agriculture

3.10.1 Measurement purpose and scope

3.10.2 Measurement issues and possible extensions

#### **Chapter 4: Accounting for environmental assets, primary natural inputs and residual flows**

4.1 Introduction

4.2 Physical flow and asset accounts for water resources

4.2.1 Measurement purpose and scope

4.2.2 Accounting entries – physical flow accounts

4.2.3 Accounting entries – asset accounts

- 4.2.4 Measurement issues and possible extensions
- 4.3 Physical flow account for energy use
  - 4.3.1 Measurement purpose and scope
  - 4.3.2 Accounting entries
  - 4.3.3 Measurement issues and possible extensions
- 4.4 Physical flow account for greenhouse gas emissions
  - 4.4.1 Measurement purpose and scope
  - 4.4.2 Accounting entries
  - 4.4.3 Measurement issues and possible extensions
- 4.5 Physical flow accounts for fertilizers, nutrient flows and pesticides
  - 4.5.1 Measurement purpose and scope: fertilizers and pesticides
  - 4.5.2 Measurement purpose and scope: nutrient flows
  - 4.5.3 Accounting entries for fertilizers
  - 4.5.4 Accounting entries for pesticides
  - 4.5.5 Measurement issues and possible extensions
- 4.6 Asset accounts for land
  - 4.6.1 Measurement purpose and scope
  - 4.6.2 Accounting entries
  - 4.6.3 Measurement issues and possible extensions
- 4.7 Accounting for soil resources

## **Annex: Research agenda**

## **References**

**Annex 3:** Correspondence between Global Consultation and UNSC draft structures for SEEA Agriculture

<b>Global Consultation structure</b>	<b>UNSC structure</b>
1.1.1	1.1.1
1.1.2	1.1.4
1.1.3	1.1.2
1.1.4	Preface
1.2.1	2.1.2
1.2.2	2.1.3
1.3.1	Preface / Annex
1.3.2	Preface / Annex
1.4	1.1.4
1.5	1.3
2.1.1	1.1.2
2.1.2	1.1.3
2.1.3	Preface
2.2.1 / 2.2.2 / 2.2.3	1.2.1 / 2.6.1 / Annex
2.3.1	1.2.2
2.3.2	1.2.3
2.3.3	1.2.4
3.1	2.1.1
3.2	2.2
3.3	2.3
3.4	2.4
3.5	2.5
3.6	2.6.1 / 2.6.2
4.1	3.1
4.2	3.2
4.3	3.4
4.4	3.5
4.5	3.3
4.6	3.6
4.7	3.7
4.8	3.8
4.9	3.9
4.10	4.2
4.11	4.3
4.12	4.4
4.13	4.5
4.14	4.6
4.15	4.7
4.16	3.10
5.1	1.1.4 / Annex
5.2	1.1.4 / Annex
5.3	Implementation guide
5.4	Implementation guide



## Annex 4: Proposed SEEA Agriculture: Physical flow account for water resources

### Physical supply table for water

	Abstraction of water; Production of water; Generation of return flows								Flows from the rest of the world Imports	Flows from the environment	Total supply	
	Agriculture		Forestry	Fisheries	Total agriculture, aquaculture	Water collection, treatment and supply	Sewerage	Other industries				Households
	Crops*	Livestock										
<b>(I) Sources of abstracted water</b>												
Inland water resources												
Surface water												
Groundwater												
Soil water												
Total												
Other water sources												
Total supply abstracted water												
<b>(II) Abstracted water</b>												
For distribution												
For own-use												
<b>(III) Wastewater and reused water</b>												
Wastewater												
Wastewater to treatment												
Own treatment												
Reused water produced												
For distribution												
For own use												
<b>(IV) Return flows of water</b>												
To inland water resources												
Surface water												
Groundwater												
Soil water												
Total												
To other sources												
Total Return flows												
of which: Losses in distribution												
<b>(V) Evaporation of abstracted water, transpiration and water incorporated into products</b>												
Evaporation of abstracted water												
Transpiration												
Water incorporated into products												
<b>Total supply</b>												

**Physical use table for water**

	Abstraction of water; Intermediate consumption; Return flows							Final consumption Households	Accumulation	Flows to the rest of the Exports	Flows to the environment	Total use	
	Agriculture		Forestry	Fisheries	Total agriculture, forestry and aquaculture	Water collection, treatment and supply	Sewerage						Other industries
	Crops*	Livestock											
<b>(I) Sources of abstracted water</b>													
Inland water resources													
Surface water													
Groundwater													
Soil water													
Total													
Other water sources													
Total use abstracted water													
<b>(II) Abstracted water</b>													
Distributed water													
Own use													
<b>(III) Wastewater and reused water</b>													
Wastewater													
Wastewater received from other units													
Own treatment													
Reused water													
Distributed reuse													
Own use													
Total													
<b>(IV) Return flows of water</b>													
Returns of water to the environment													
To inland water resources													
To other sources													
Total return flows													
<b>(V) Evaporation of abstracted water, transpiration and water incorporated into products</b>													
Evaporation of abstracted water													
Transpiration													
Water incorporated into products													
<b>Total use</b>													

Note: Crops\* - this column can be disaggregated into key product groups as required.