DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

SEEA Revision Chapters 1-6

Comment Form

Global Consultation Comment Form

Revised SEEA Chapter 1 - 6

Deadline for responses: 7 December 2011
Send responses to: seea@un.org

Your name:	Art Ridgeway
Your country/organization:	Canada / Statistics Canada
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To submit responses please save this document and send it as an attachment to the following e-mail address: seea@un.org.

The comment form has been designed to facilitate the analysis of comments. In Part I general comments on the general style, content and coverage of the chapter are sought. In Part II any technical and other comments should be included.

Relevant documents

Before submitting responses you are encouraged to read the accompanying papers available on the website.

Revision of the SEEA: Draft Version for Second Round of Global Consultation, October 2011 – Chapters 1 – 6

Reading guide for the SEEA Revision Second Round of Global Consultation

Supporting material for selected classifications and lists in the revised SEEA

Part I: General comments

This is the first global consultation based on the complete set of chapters for the SEEA Central Framework. In this section please provide general comments on the drafts chapters. You may like to consider providing comments on the style and tone, the content and coverage, and the general accessibility of the material.

Chapter 1

Overall the style and tone are appropriate.

The link between underlying data, the SEEA framework, and indicators derived from the SEEA that could be policy relevant should be made more explicit / prominent. There is a reasonable effort to do this in section 1.2 Policy relevance and usefulness of the SEEA [e.g., and "...the summary information in the SEEA (provided in the form of indicators of progress towards policy objectives)..."] [paragraph 1.12] and in section 6.4 SEEA indicators, but the importance of high-quality and internationally comparable data as the foundation for the SEEA should be highlighted up front in Chapter 1.

Overall, there is reference to indicators and state of environment reporting as things that SEEA contributes to but no reference to national programs of environmental indicators, sustainable development indicators, state of environment reporting, or other national integrated environmental information programs. This is rectified somewhat in section 6.4.6. SEEA and international indicator initiatives but it should be mentioned up front in Chapter 1.

Some of the major strengths of SEEA are also important objectives of other national integrated environmental information programs (e.g., "positively benefit the creation and setting of policy and the process of decision making." [paragraph 1.12] and "the linkages and connections developed in the SEEA … provide an additional and broader perspective and hence add value to the detailed information already available" [paragraph 1.9]). There should be some discussion included on what the relationship between SEEA and other national integrated environmental information programs should be.

There is some redundancy in the document, especially between chapter 1 and the following chapters (e.g. same graphic on p.7 and p.30), which can sometimes make the reading repetitive. The document could benefit from being shorter.

The writing style and content is somewhat academic which makes it difficult to apply directly to policy work. The document could benefit from a more concise and pragmatic style, including more examples.

Chapters 2-3
Overall style, tone, content and accessibility are good. There are no general suggestions for these chapters.

Chapter 4

As a general comment on implementation, it would be useful to know from SEEA what problems to expect when trying to build a system of accounts. What difficulties should be expected in getting the data? How are they transformed into something useful? What difficulties should be expected in doing so? What are the weaknesses in the system? There could be more guidance in this regard.

Chapter 5

The subject matter coverage of chapter 5 is well balanced with an appropriate overall scope. As follow-on to the May draft, the additions and changes ultimately presented in the refined chapter brought a definite improvement to the document and addressed most of our previous comments.

Chapter 6

Overall the style and tone are appropriate. The chapter is very useful and really helps understand the whole document better. However the presentation of the accounting tables in Chapter 6, while useful for the accountant, do little to inspire the non-accountant to use them. An analytical example would be very useful.

In particular, the integration of physical and monetary accounts looks promising. The use of these in the SEEA is potentially more useful to Canada than the approach proposed in the OECD's "State of Material Resources and Resource Productivity" report in the mining sector. The different approaches will have to be evaluated carefully to ensure the selected approach works for Canada.

Finally, policy departments have expressed an interest in developing a better understanding of the SEEA, both from the standpoint of the implementation and interpretation of the accounts, and from the perspective of contributing to future discussions on approaches and methodology. From this it is clear that the implementation plan and follow-up promotion of this document will be an important task.

Part II: Technical and other comments

In the box below please supply any additional comments including those of a more technical nature. As this is the first consultation where the complete 6 chapters have been released, comments on the consistency of the technical content across the chapters would be appreciated.

Please reference your responses with the relevant paragraph number or section number.

1.1 (and other references to SEEA as a "conceptual framework"): Our definition of a "conceptual framework" is one that helps identify gaps and linkages. Granted, SEEA contains many concepts but even the SNA is a measurement framework, depending on a body of economic theory to identify what should be measured. We would prefer to have SEEA referred to as a measurement framework. Para 1.61 refers to SEEA as a "complete system" when it is more a set of somewhat interrelated accounts. In addition, it is not clear that it is "multi-purpose" when the two fundamental purposes are listed (and when one of them is open for some debate – i.e. the role of SEEA in describing the state of the environment).

1.2 The global consultation will put this point to the test, but there should be some sense that the SEEA has not been tested in all countries and that there may be modifications required in specific circumstances.

1.3 "may pertain" should perhaps read "could be extended to"

1.5 "general sets of statistics" should perhaps be changed to "ad hoc statistics" – many

general sets of statistics adhere to a core set of concepts and definitions. This para could be probably be removed, since 1.6 covers the basic idea.

1.7 mentions a multi-disciplinary approach to integration of information. The integrated data may cover several subject matter areas, but the term multi-disciplinary suggests something else.

1.11 “Responsible use” seems more like an ethical question, and thus the introductory sentence does not really reflect the actual policy issues that follow it.

1.13 Sustainable development is increasingly understood as the intersection of environmental, human and economic sustainability. Since SEEA does not measure the human and economic aspects, this should better be referred to as “environmental sustainability”.

1.16 This could be mentioned up in para 1.5, although it is not clear that the classifications have been internationally agreed upon.

Chapter 1 includes references to the usefulness of the SEEA for considering the impact of taxes. It may be worth pointing out that the *impact* and the *incidence* of taxes are different things. For example, in a competitive market, a tax will tend to be pushed forward to consumers in the form of higher prices. Different market structures and demand elasticities will lead to different patterns of burden sharing. It should not be assumed that the burden of any tax is actually paid by the firm it was levied on. Thus, while the SEEA will be useful for estimating tax impacts, subsequent economic analysis will be required to determine the incidence of any tax or fee.

1.31 Does the net present value (NPV) method take into account increasing value with increasing scarcity of non-renewable assets and/or decreasing value due to technological change? This factor should be discussed.

1.32 The point is often made that non-market prices are not observable and therefore subject to debate about their accuracy. A related point is rarely made: i.e. that market prices are not necessarily accurate either as they often do not take into account negative production externalities associated with the good or service. The fact that market prices are readily observable does not mean they accurately capture broader environmental, health or social costs. In this sense, market prices can be inaccurate too.

1.46. This is assuming a SEEA Volume 2 will be completed and, to some degree, what the contents will be. (also Para 1.103)

1.48. Regarding “changes in stock”—this should also take into account natural processes (growth, fire, succession, etc.).

It is recommended to include a graphical figure showing the relationship between underlying data, the SEEA framework, and indicators derived from the SEEA framework that could be policy relevant be included (*i.e.*, a pyramid diagram with data on the bottom, the SEEA framework in the middle, and indicators at the top). The most likely spots for this figure to be included are sections *1.3 The SEEA as a system* or *1.2 Policy relevance and usefulness of the SEEA*.

1.60 refers to “...a spirit of collaboration and respect between environmental accountants and statisticians...” It is suggested that this also include economists as well as ecologists, and perhaps others.

1.66. There is some concern that the international dimension is not sufficiently robust to claim that it is well placed to address issues that are multi-national or global in nature.
1.85 SEEA Volume 2 is sometimes referred to in the present and sometimes in the future.

2.21 Could expand the explanation on the SEEA Experimental Ecosystem Accounts. What is the status, and plan for the those Accounts and will they eventually be integrated with the Central Framework?

2.39 This is confusing for non-accountants. The description of government activity and the nature of what is included on the industry side should be expanded to make it clear that all inputs and outputs that are a result of government activities are in fact captured elsewhere in the tables.

2.40 Household collection of water and fuelwood is mentioned. Will activities such as gardens for food be included? And how are community activities recorded?

2.56 Could provide explanation of how and why the Accumulation and Environmental columns are reworked into an asset account framework.

3.56: The use of a conditional statement in the first sentence (i.e. "...would require...") leads the reader to assume that flows of nutrients and other substances from the environment to cultivated biological resources within the economy are not accounted for in the current PSUT framework. If this is the case, the text should be explicit about it. If this is not the case, then it should explain clearly how these flows from the environment to the economy are treated within the PSUT. There does not seem to be a balance of flows of natural substances. E.g Carbon flows from the atmosphere to cultivated biological resources hence into the economy but there does not seem to be an accounting of carbon that may flow back into the environment as a 'residual' in the form of sequestered carbon as soil carbon.

3.185 second last sentence: should it not have seas and oceans included along with the inland water system?

3.190 remove after the ":" since the extra clause doesn't add anything to the previous one.

3.193 the definition of abstraction suggests "removed" is a key criterion, but hydro turbines don't necessarily remove the water from their course. Should something be added to account for this?

3.196 it is clear that water flows in uncultivated forests are out of scope from a physical supply and use table perspective. However, there is a considerable amount of water required to produce timber resources and an analysis of this flow could be important for some applications (e.g. estimates of virtual water in wood products etc.). This aspect should be mentioned.
In addition, there seems to be a mismatch between the definition of what soil water abstraction is (i.e. uptake of water by plants that is either embodied in the harvested products or is transpired as the crop grows) and the corresponding identity (i.e. abstraction of soil water is equal to the amount of transpiration by the crop). Is the soil water embodied in the biomass missing in the accounting identity and not accounted for or is it considered as a "residual" of the form (1 - x)? The amount of transpiration will not account for the, albeit small, amount of water that is embodied in the harvested product. Also it is calculated taking into account location effects but does it account for variability of yield and transpiration resulting from year to year climate or weather variability?

3.200 missing "or" between "own use" and "for distribution"

3.207 It is not clear what “recycling” of water is. Does it refer to recirculation? The term is also used in 3.208.

3.213 first sentence is unclear. Should simply say “urban runoff is a significant flow of water.”

3.215 It is not clear that water in beverages and food products are lost – they return to the inland water system soon after consumption – only exported food products would leave the domestic water cycle and even then not permanently.

3.216 the phrase “distributed surface water used for crop irrigation or soil” should be removed (it doesn’t add anything and makes the para confusing).

3.220 “hydrological water consumption” it is not clear what hydrological could mean in this context.

3.221 It is difficult to compare water to energy in this context since all of the water remains in the system and is not lost as is the case with energy (i.e. it will eventually return via precipitation somewhere).

3.230 It is unclear whether or not the estimation of organic input flows resulting from natural processes such as nitrogen fixation takes into account factors such as crop types, tillage regimes and post-harvest residues.

3.231 In the case of a positive nutrient balance, are residuals remaining in the soil as surplus in time period t considered a stock or are they considered a flow to be used by future crops at t + 1 for example?

3.242 There does not seem to be a recognition of sequestered carbon as a residual. The only things discussed as residuals are those materials that are essentially a by product of production that are discarded, discharged or emitted (terminology that implies waste material) to the environment, or transformed. The explanation of why this capture of carbon is not covered should be made clear here.

3.260 Last sentence is not clear – does solid state refer to sludges? Should there be some specified percentage water content to distinguish solid wastes from wastewater?

3.261 seems to mix water emissions and discharges of wastewater together.

3.262 should the “during infiltration” read instead “that infiltrate”?

Chapter 4 general: There is some interest in determining how beneficial management practices in agriculture would fit into this framework. It is not immediately clear from the text, nor is it clear if existing data collection on these practices would meet the needs of the accounts.

4.29 It seems like the primary purpose is not applied here. The following change is suggested: “In general, countries should therefore include the production of renewable energy and energy saving activity under their primary purpose, but in some cases there may be an analytical interest (OR a reporting requirement?) in putting all such expenditures under resource management, regardless of the primary purpose, to facilitate international comparisons.”

4.31 These definitions are clear, but they can be very difficult to apply in practice. This

measurement challenge could be highlighted in 4.30, especially with regard to integrated technologies (4.32).

4.31 (iii) Presently, Canada does not include revenue of sales of "adapted" goods in its measurement of environmental goods and services. The current survey vehicle used for these measurements has limited its scope to those products whose use is more definitively linked to environmental well-being and whose impact on the environment is less likely to vary. (i.e., products that are not a moving target in terms of efficiency and benefit to the environment.)" Some flexibility is recommended here.

5.8 There may be a need to establish some careful linkages between the Central Framework and the SEEA Experimental Ecosystem Accounts. It is suggested in the text that the consideration of interactions between assets as ecosystem components would be included in the SEEA Experimental Ecosystem Accounts. This seems to imply that the system of accounts would not be sensitive to the negative impacts of harvesting / extraction pressures on the capacity of ecosystems to provide ecosystem goods and services. Even within the Central Framework one can consider that depletion of soil resources would have implications for timber, aquatic resources or other biological resources.

5.18 For clarity the following sentence could be as follows: "Natural resources include all natural biological resources (including timber and aquatic resources) and natural non-biological resources (mineral and energy resources…)."

5.38 (last sentence, typo) Non-financial assets …

Section 5.2.2. As was noted previously, aligning the concept of environmental assets from the perspective of ecosystems and also from the perspective of individual components is problematic. While the two perspectives have been essentially separated in volumes 1 and 2, there may still be scope for some form of integration of the two as development of concepts and methods for ecosystem accounting progresses over time.

5.14 We are in agreement with the distinction being made the conceptual scope of assets in physical terms vs. monetary terms. Conceptual alignment with the SNA asset boundary, for example "only land considered to have economic value is within scope" is the most practical approach in regards to valuation of assets. I.e. as natural resource asset values will be integrated within the national wealth accounts and balance sheet accounts of the SNA. It makes sense to include all of the resources that "currently or could" provide benefits to humanity as the outer limit of the conceptual scope of physical asset accounts, for reasons noted later, in 5.186.

Section 5.2.3
This section fulfils its purpose of explaining the distinction between physical and monetary estimates and differences in the measurement scope of the SEEA and the SNA. Figure 5.2.1 could include some examples in parenthesis for "natural resources with no economic value".

Section 5.4.2
Generally, we felt the new depletion text provides a clear description of the concepts and terms needed (including sustainable yield) to understand depletion of non-renewable and renewable natural resources.

5.76. We agree that the definition could benefit from refinement. The following may serve as a possible alternative: "depletion in physical terms is extraction beyond the rate of replenishment."

5.84 The text on sustainable yield has been kept basic and is free of ambiguities, which we

agree is wise. Having said that, we would suggest 5.84 could make some reference to the importance of harvesting units within the appropriate age class; i.e., without delving too deeply into the science of it, perhaps a note on the need for appropriate management practices / regulation could be added to the sustainable yield perspective.

5.88 – 5.93. This sub-section is understandably difficult to write. The overall message becomes clearer once the final paragraph, 5.93, is reached. It may not be a bad idea to put this notion – that the measurement of degradation is not pursued in the central framework – up front in the sub-section, as a means of setting the direction of the sub-section. The inclusion of examples was helpful; if possible, more of these could be added.

5.115--last sentence should be as follows "Economic theory suggests that over the long term resource rents should be positive." (Currently the word "not negative" is used; not negative includes zero, and the long-term resource rents should be greater than zero).

Table 5.4.1--the following table would be clearer

Output (sales of extracted environmental assets)
Less Operating costs Cost of labour + Cost of other inputs (raw materials, fuel & electricity etc.)
Equals Gross Operating Surplus
Less user costs of produced assets Consumption of produced assets (depreciation) + Return to net produced assets
Equals resource rent Depletion + Return to environmental assets

5.136--Second sentence could be simplified: "Estimates of the asset life must be…*In a very simple case the asset life can be calculated by dividing the closing stock (opening stock + addition- extraction) by the amount extracted over the period.* However…"

5.144 Replace "government" by "society"

5.150—Like the NPV formula, include a formula for resource rent "RR"

$$RR = TR - OC - (r_k K + \delta)$$

where RR = Resource rent, TR= total revenue
OC= operating cost—notably labour, raw material and fuel costs
K = net produced capital stock, r_k= rate of return to net produced capital
δ = depreciation of produced capital

5.199 We were pleased to see the inclusion of this paragraph in this section, as it articulates quite well a point we made while commenting on the first draft: the notion that uncertainty in regards to expected extraction profiles and incomes hinders one's ability to value resources in all of the "known" resources categories. Taking account of the likelihood and timing of extraction can only be done with certainty for the Class A resources, as noted.

5.205 The last sentence should be as follows: "In the absence of other information on future resource prices, a proxy of unit resource rents (regression based estimates, moving average) should be used…"

5.260 For land cover, it is proposed to employ FAO's Land Cover Classification System. This classification may not mesh well with existing country-specific classifications. There is a similar issue with the land use classification and Table 5.6.1. Greater flexibility may be required here.

5.264 refers to Annex A5.4 which is titled *land use classification.* It would seem to us that this may be a typo and should be titled *land cover type* instead; as the paragraph is referring to land cover types and points to this table as denoting rules for land cover type. So there is some confusion as to whether it is land use or land cover being discussed.

Table 5.6.6. There is no place to record transfers of land between types of forest as a result of changes in management. For example, conversion of primary forest to planted forest following harvesting could be recorded as a gain in planted forest area but not a loss of primary forest - because it is not really deforestation as defined in para 5.287 or natural regression as defined in para 5.288. There are also needs to be "reclassification" accounting on both the additions and reductions side of the ledger.

5.284 is not consistent with the use of the term afforestation by UN's Framework Convention on Climate Change (UNFCCC). The text suggests that transition from other wooded land to forest is afforestation, while the reverse transition is not deforestation. It also seems that deforestation only occurs in the event of land use change, while afforestation can occur any time there is silvicultural planting or seeding (with or without land use change). Symmetrical accounting for afforestation and deforestation is useful because then afforestation minus deforestation equals net forest area change. This symmetry does not exist in the present definitions. In addition, UNFCCC only considers transitions in and out of "forest" to be afforestation and deforestation - and only those transitions that are "direct human induced." Natural restoration is not included (as it is in the SEEA definition of afforestation). This difference with UNFCCC is important and should be noted to avoid confusion over the different estimates.

5.323 Use of simulation models to produce quantitative measures of yield, runoff and soil erosion is likely the only practical means of making these measures but some indication or estimation of uncertainty is also required in this approach. Models will be adjusted to local conditions so inter regional or international comparison will be difficult without the associated measure of uncertainty. Also models will vary with time as additional science and better input data are incorporated. The accounting will need to adjust or recognize the variation in model methodologies over time and values adjusted to compensate.

5.325 It should be clarified why the scope of accounting for soil resources is restricted to agriculture and forestry. Soils outside of these uses still act as biological systems providing valuable environmental services. For instance arctic and non-agricultural organic soils play a large role in the global carbon cycle.

5.341 The distinction between timber resources used for wood supply vs those not used is often difficult to make. Similar issues will probably be found in other jurisdictions as well.

5.344 The definition of timber does not fit neatly with the classifications currently used in Canada -- it lumps in many different wood/fibre qualities into one (live, dead standing, chronic wasting disease (CWD)). This may be problematic because it is neither merchantable nor total volume which are currently recorded. To make it easier to apply to reality, it would benefit from a distinction between these various stock types and no guidance on this is given in the document.

5.351 The cultivated vs natural distinction will also be challenging, but considerable flexibility is provided to allow for differences in national circumstances.

5.359 seems inconsistent with 5.344. One considers mortalities to be losses and the other considers both living and dead to be part of the stock. Some clarification is required here. In addition, the distinction between natural loss and catastrophic loss can be problematic (it tied negotiations for UNFCCC Land Use, Land-Use and Forestry (LULUCF) in knots for several sessions).

Section 5.8.5 will require consistency between national greenhouse gas (GHG) inventory accounting for LULUCF (UNFCCC) and SEEA. There is far more to forest carbon than simply timber (even when as broadly defined as here, in para 5.344). At least, it is acknowledged as "experimental." Eventually, as the thinking around this matures, SEEA could take its carbon stock directly out of LULUCF and simply add the monetary part of the accounting to that. This would require consistency between UNFCCC and physical asset accounting - which we don't yet have because the carbon model and the asset accounts are based on different data sources and methods.

Table 5.9.2 Environmental variables, in particular climate, can be critical determinants of changes in fish stock sizes, either on their own or in combination with other factors. For example, fish productivity will often track temperature regime shifts on a variety of time scales. It is not clear either in section 5.9 or in earlier definitions of terms (e.g., paragraph 5.50) whether such changes should be classified as "normal reductions in stock" or "catastrophic losses." We suggest that this would likely depend on the context. For example, relatively small fluctuations with gradual climatic trends would be “normal” while more significant population changes due to shorter-term phenomena such as El Nino would be “catastrophic losses.” In any case, how such changes are to be addressed and categorized should be explained in the text.

5.410 The scope of the physical asset account for aquatic resources (all species subject to harvesting activity or cultivated within the national boundary) in the Canadian context would potentially include commercial sea and freshwater, recreational and subsistence fisheries as well as aquaculture production. It would be ideal to clarify the scope for international comparisons.

5.414 Aquaculture escapes are considered to be a reclassification from 'cultivated' to 'natural' resources. However, this will depend on the specific case and context. E.g., Atlantic salmon escaping from a Pacific-Ocean operation will not become part of the natural resource stock in that area. How such escapes should be dealt with is an open question, as there is also the possibility of transmitting diseases, displacing native fish populations, etc. However, they should not be counted as simple additions to natural stocks.

5.419 Regarding measurement of the size of a stock, the importance of measuring the sexually mature portion is noted. However, it is not clear what consideration should be given to the sexually immature portion. Presumably this cannot be simply ignored as it is a part of the population and will later contribute to the sexually mature portion. This issue should be further clarified, e.g., by saying that mature and immature portions should be accounted for separately.

5.423 CPUE can indeed be a helpful indicator of population changes, but it is quite susceptible to a variety of biases and weaknesses. Some of these are alluded to in the assumptions noted in this paragraph, but there are other situations where CPUE might not give an accurate indication of population changes (e.g., when ITQs are introduced in a fishery less efficient harvesters will sometimes leave the industry resulting in an increase in overall CPUE; and when new technologies are introduced harvesters often become more efficient). A more complete list of the challenges and risks associated with using CPUE as a population indicator should be provided here.

5.424 It is not clear what is being proposed here. Is the suggestion to count all species as being part of one aggregate stock? This should be clarified.

5.427-5.428 We agree that gross removal would be an ideal indicator and that this is not viable. However, gross catch may not be much more viable, as data on discards are typically sparse.

5.433-5.434 As with data for discards, data on illegal fishing, while they should be included, are typically very difficult to obtain. This should be acknowledged.

5.436 Notes that 'reappraisals' are likely to occur, i.e., revisions of stock estimate due to updates in model parameters. This is true, and should be reflected in the discussions around table 5.3.1 regarding upward and downward reappraisals in the natural fish resources column. For example, in some cases, significant reappraisals may occur depending on the stock (e.g. Pacific salmon due to climate change), so a generalization one way or another (it is significant or not) should be more nuanced.

5.443 In the discussion of quotas, it should be made clear upfront that the quotas under discussion are portions (whether specified as percentages or absolute amounts) of the overall allowable catch. The term "quota" is sometimes used to refer to the overall catch, which could lead to confusion here.

5.444 These quotas are often assigned to persons, but also to firms, communities or other groups or entities.

5.447 We suggest revising the definitions of ITQ and ITSQ. Most quota programs operate on a share basis (what are called ITSQs here), but these are typically called ITQs. We suggest that the simplest approach would be to follow the terminology of the OECD in their Glossary of Statistical Terms (http://stats.oecd.org/glossary/index.htm): the term ITQ could be used to refer to both share-based and absolute quotas, with the distinction simply noted in the text. The distinction between ITQ and ITSQ (as currently defined in 5.447) is not retained in later parts of text so there would be no ambiguity introduced by using this approach.

5.454 Government subsidies to fisheries are pointed out here without any discussion of their implications for the accounts, or how they should be dealt with in the accounts. E.g., should they be deducted from resource rent, or from some other value(s)? This should be addressed. We suggest that reference be made to extensive OECD work on categorizing and analysing the impacts of fisheries subsidies; a helpful reference will be “Financial Support to Fisheries: Implications for Sustainable Development”, OECD, 2006.

5.455 A discussion of asset life raises some difficulties, as a finite asset life is rarely if ever a management objective – rather, the aim is typically sustainable yield and thus sustainable benefits. It would be much better to work with the principle of expected levels/trajectories of exploitation as noted in section 5.4. Furthermore, the suggested extrapolation of population trends or CPUE trends to estimate asset life would raise numerous problems and should not be recommended here. For example, declines in CPUE are normal in the early stages of exploitation of a fishery as the stock is initially depleted from its carrying capacity, but management will normally aim to stop this decline in order to maintain population size at a level that produces a substantial sustainable yield (in the sense of Figure 5.4.1).

5.467 It is not clear what river run-off is: does it refer to streamflow?

Figure 5.11.1 The lower right box shows subsurface water and suggests it can evaporate,

which is not the case.

5.468 The first clause is not necessary. Also, instream is not defined: is it streamflow? If you have streamflow data it is not clear what seasonality would bring to the table since the flow data will have seasonal effects in it. Also, this is insufficient to judge the longer term sustainability as suggested since information of ecosystem requirements and longer term water renewal would also be required.

5.469 Soil water is not measured by volume, more as a percentage (and is referred to as soil moisture). It is not clear how this could fit in the table.

5.475 It is not clear what the difference is between regulation and control. Note also that lakes are not standing water, they are slow moving. Also a glacier is an accumulation of snow, not ice: it becomes ice later.

5.476 “equivalent” should specify that it refers to equal accounting treatment since these are not equivalent flows in a physical sense (they are the opposite in fact).

5.478 Again, here we would prefer soil moisture. Also, for the forest land water should this be only cultivated forest land?

Table 5.11.2 We recommend removing “actual” from “actual evaporotranspiration” since potential evapotranspiration is just a benchmark value that would not be used in this context. In addition, evapotranspiration is the sum of evaporation and transpiration, so it is unclear what evaporation refers to in the row heading since this should be covered under evapotranspiration.

5.482-3 repeats info from 5.476-5.478.

5.483 Should change the term “negligible”: soil moisture may be small, but it is a crucial part of the cycle and not negligible from that perspective. Also, it could be argued that the opposite is true from what is stated at the end of the paragraph. i.e. soil moisture is very easy to measure directly, but quite difficult to estimate with other data.

5.484 ii) it is not clear how “wet” adds anything here. It is also not clear what “especially in cases of flooding” could be referring to. Should say the precipitation falls “onto” surface water as opposed to “into” it. Seepage from surface water to aquifers should still go through the soil.

5.485 i) turbined water is not necessarily removed, we suggest this be clarified.
ii) As in the comment to table 5.11.2, it is unclear what evaporation adds to evapotranspiration in the section heading. The “potential/actual” distinction is not correct. One is a model, the other is reality. Actual is the one that depends on conditions – potential is a maximum. In the final sentence, actual is less rough an estimate that potential in this case.

6.26 Depletion of some assets is included but it seems this does not necessarily account for the change in quality of the assets since monetary depletion is defined as the decline in value related to extraction only (i.e. if there is no extraction there can be no depletion, but quality and therefore value could decline due to other factors). Is there scope for a discussion that reflects loss of quality here?

6.29-6.30. The concepts presented here may be too abstract for non-experts. It would benefit from some examples.

Section 6.4 the assumption is that “many indicators can be sourced from the SEEA” (paragraph 6.88) and it is recommended “that the SEEA framework be used as the basis for compiling indicators wherever appropriate.”(paragraph 6.108) This presumes that the SEEA is built and populated. It should be noted that the SEEA and other national integrated environmental information programs are both dependent on the same “individual sets of environmental statistics” (paragraph 1.56) and that information flow could go the other way (i.e., from national integrated environmental information programs to the SEEA.)

Section 6.4.6 The SEEA and international indicator initiatives are important ones. It should be noted that, while “it is recommended that in the development of sets of indicators that focus on environment and sustainable development issues that the SEEA framework be used as the basis for compiling indicators wherever appropriate” (paragraph 6.108), using the SEEA framework does not guarantee the appropriateness, usefulness, internationally comparability, or policy relevance of international indicator activities.

6.113. This statement is repeated frequently in slightly different forms (e.g., para 6.109).

6.140. Could this not also show the indirect household consumption and the other categories of final demand (e.g., exports, inventory)?

6.141. Without time-series data on EPE and emissions, the link between the two would not be evident. For example, an industry may make an effort to clean up due to new regulations in one year and the reduction in emissions appear two years later.