DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

SEEA Revision
Issue 14
Outcome Paper

Outcome Paper for Global Consultation

Issue #14: Recording of depletion for renewable resources[1]

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[1] This outcome paper has been prepared by the SEEA Editor. It is based on papers presented to the London Group of Experts on Environmental Accounting and discussions among those experts. Investigation and research for this outcome paper was led by David Bain, Peter Comisari and Andrew Cadogan-Cowper of the Australian Bureau of Statistics.

A. Introduction

1. The System of National Accounts (SNA) is of the view that if an asset used in production is infinitely abundant (or infinitely renewable) then any amount of use would not affect its value. Consequently, there is no decline in its current value during the accounting period as a result of its use in production and the entire value of the earnings generated from using such an asset in production is income to the owner of the resource. This condition cannot apply to produced assets but is implicit in the SNA treatment of some non-produced assets. The implication of assuming no decline in the value of natural resources used in production must be that natural growth always keeps pace with harvest of the resource or that there is such an abundance of the resource that it is free and there is no cost to using up this natural resource.

2. This view does not always reflect reality. When natural resources are used unsustainably or their abundance is reduced, the income generated from their use includes revenue from selling part of the natural resource. That part of the resource will not be available for use in future production. When a natural resource is depleted through its extraction and use in economic production, the value of such depletion should be recorded as a cost of production both by the units using the resource and by the economy.

3. The recommendations concerning the depletion of non-renewable natural resources are presented in the outcome paper for Issue #13: Recording of depletion for non-renewable resources. There are close parallels between these recommendations and the discussion contained in this outcome paper on the depletion of renewable natural resources. Readers are encouraged to read this outcome paper in conjunction with the outcome paper for Issue #13.

4. The clear distinction between the two issues is that renewable resources are by definition, capable of increasing in quantity through natural growth without any economic production process occurring. This capability creates quite a different accounting challenge.

5. This paper presents the relevant accounting issues and makes a recommendation on the preferred treatment of renewable resources for the revised SEEA. An annex to the paper presents a set of accounts incorporating the proposed treatment to help readers understand the implications.

B. The scope of renewable natural resources

6. The scope of renewable natural resources considered under this issue is those natural resources which are harvested or extracted and which can regenerate over time. The most common examples are forests and fish stocks. It is possible that these natural resources might be extracted to extinction but even in these situations this will occur over a period of time and the stock of the natural resources will continually rise and fall through cycles of natural growth and extraction. Thus the situation is quite different from that of non-renewable resources such as mineral and energy resources.

7. The coverage of renewable natural resources under this issue does not extend to renewable energy resources such as wind, solar, wave and hydropower as the underlying natural resource in those cases is not considered to be a resource that grows over time and the level of the natural resource is invariant to the extent of capture.

8. Finally on the issue of scope, when renewable natural resources are considered cultivated – for example plantation forests –the resources are considered to be produced assets and hence natural growth and additions are considered to be the output of a production process. If these cultivated natural resources are considered to be grown for harvest then, while they are growing they are treated as work in progress (i.e part of inventories) and no consumption of fixed capital is recorded. On the other hand if the cultivated natural resources are considered to be themselves producing an output, eg dairy cattle producing milk, then they are treated as fixed assets and consumption of fixed capital is recorded. The treatment of cultivated natural resources is not considered further in this paper as the accounting treatment is well articulated in the 2008 SNA (2008 SNA paragraphs 10.88 – 10.96 & 10.140).

C. Recording flows of extractions and natural growth

9. In the 2008 SNA all natural growth and additions to non-cultivated renewable natural resources are treated as other changes in volume (2008 SNA paragraph 12.19 – 12.20). The value of sales from extracting the resource are considered market output of the extracting firm and any costs of using up the resource are treated as an economic disappearance of a natural resource in the other changes in volume of assets account (2008 SNA paragraph 12.27). It is noted in paragraph 12.20 that while in principle the natural growth should be recorded on a gross basis – i.e. before the deduction of any depletion – it is more likely in practice that a net entry of natural growth less depletion is the basis of recording.

10. A major aim of SEEA is to explicitly reflect the cost of using natural resources within the production and income accounts of the traditional national accounts. In order to achieve this it is necessary to change the boundaries of these traditional accounts to reflect the depletion of natural resources. This "extension" is relatively easy to see in the case of non-renewable natural resources such as mineral and energy resources and is understood as adding a new entry to the production and income accounts, depletion, reflecting the cost of using up these natural resources. In effect the economy is seen to be purchasing services provided by natural resources.

11. Usually, this extension is not seen as increasing the production boundary of the SNA since the flow being incorporated does not increase incomes but "simply" reflects an additional cost not previously recognised.

12. In the case of non-renewable natural resource however, the ongoing process of re-generation of the resources means that only reflecting the cost of using up the natural resources in the production and income accounts may not be a realistic portrayal of the relevant flows. Consequently, in order to best reflect the changing future income stream from renewable natural resources a flow that offsets the decline in value of the resource due to extraction needs to be incorporated into the production and income accounts. Thus, a flow equal to the value of natural growth needs to be recorded.

13. Reflecting the natural growth of renewable resources in the production and income accounts necessarily raises the question of whether this implies an extension of the production boundary of the SNA. There may be concern that the addition of natural growth as a positive flow to the existing measure of output – i.e. the marketed sales of natural resources – leads to a type of double count of output since the growth would seem to be valued twice. Further, in accounting terms, the renewable natural resources in question are, in SNA terms, non-produced assets, and it seems inconsistent to record the growth in these natural resources as part of the production account even though the asset being increased is non-produced.

14. Discussion in the London Group determined that despite these specific accounting concerns there were strong benefits supporting the accounting for renewable natural resources through the explicit inclusion of both the cost of using up the natural resources and the natural growth of the resources in the SEEA's production and income accounts. It would allow the development of meaningful depletion adjusted measures of value added, operating surplus and saving, measures that are all consistent with the broader aims of the SEEA. If the SNA recording of natural growth in the other changes in volume of assets accounts was continued, the meaningfulness of these measures would be compromised.

Recommendation: That the revised SEEA record both the natural growth and costs of using up renewable natural resources in extended production and generation of income accounts.

D. Valuing natural resources and depletion

15. Before considering the proposed treatment of the flows associated with renewable natural resources it is necessary to introduce some general principles of valuation of natural resources. Ultimately, the flows and the asset values must be accounted for in a consistent manner.

16. The general principle in the SNA for valuing an asset on a balance sheet is that it should be valued as if it were being acquired on the date to which the balance sheet relates. Such valuation relies on prices for these items being available on the balance sheet date, and ideally, these prices should be observable market prices for the item in question. Applying this valuation method is not usually possible for natural resources as market price information is often not available.

17. The next-best option in the SNA is to approximate market prices by the discounted value of the income stream that assets will yield over their effective life. This is the Net Present Value (NPV) method. While issues of measurement, appropriate discount rates, and returns to produced assets can be significant, there is a general consensus that appropriate values can be assigned, in the absence of market transactions, by calculating the NPV of the stream of future resource rents a resource will yield until it is exhausted. In theory, this is equivalent to the market price of the natural resource.

18. The NPV formula can be represented as in equation 1.

$$V_t = \sum_{s=1}^{N} \frac{RR_{t+s}}{(1+r_t)^s} \qquad \text{(Equation 1)}$$

where: V = net present value, RR = resource rent, r = discount rate, N = asset life. Note that the time period "t" refers to the accounting period in respect of RR and r but for V it refers to the balance sheet date at the end of the accounting period – i.e. this formulation gives an estimate of the value at the end of period t.

E. Resource rent

19. Natural resources, like produced assets, provide an income stream as they are used which is remunerated as part of the gross operating surpluses generated by the units that use them. The gross operating surplus of a unit using a combination of produced assets and natural resources can be partitioned to show how much is attributable to produced assets and how much to natural resources. The part due to natural resources is known as 'resource rent'. The other part represents the value of the capital services of produced assets. It is equivalent to the costs of using the produced assets in the production process. These costs are comprised of the depreciation of the produced asset and a normal return on the produced asset – i.e. the opportunity cost of investing in the asset. In the same way the resource rent can in turn be decomposed into a measure of depletion of the natural resource and a return to the user of the resource (return to natural resources).

20. Estimates of resource rent are normally derived residually. The starting point is Gross Operating Surplus (GOS) which is equal to Output less Intermediate Consumption (IC) less Compensation of Employees (COE). GOS is the return to the producer before accounting for any costs of produced assets or natural resources. Following the logic of the previous paragraph we can see that resource rent is a component of GOS and thus we define

GOS = Resource Rent + Capital services of produced assets (Equation 2)

Resource Rent = GOS – Capital services of produced assets (Equation 3)

21. As noted, resource rent has two components as presented in the following equation.

Resource rent = Depletion + Return to natural resources (Equation 4)

22. This second formulation of resource rent can also be derived from the net present value formula above (Equation 1) by recognising that the concept of depletion, as for the concept of depreciation, is equivalent to the change in the value of a natural resource due to the physical removal of the resource. Using the NPV formula we can derive the difference between V_t calculated at the beginning and end of a period and this will equal depletion. Thus we have

$$d_t = V_{t-1} - V_t = RR_t - rV_{t-1} \qquad \text{(Equation 5)}$$

where: d = depletion

Equivalently,

$$RR_t = d_t + rV_{t-1} \qquad \text{(Equation 6)}$$

23. We can see by comparing equations 4 and 6 that under an NPV approach the Return to natural resources will equal rV_{t-1} and in this sense r should be interpreted as the rate of return.

24. It is important to note that the resource rent earned is obtained from the process of extraction of the natural resources and must be based on observed, marketed output. It is the extraction and sale of the natural resource that generates the operating surplus and hence the resource rent.

25. However, in the case of renewable resources, the treatment of natural growth is less clear. This growth is not directly sold on the market and hence cannot be added to the value of the resource rent. At the same time, for a complete accounting of the extracting firm it makes sense to record all the flows associated with normal extraction – the value of the resource rent from marketed output, the cost of using up the natural resource and the natural growth. A complete accounting for all of these components would enable derivation of a depletion adjusted operating surplus for renewable resources within the accounting structure.

F. Net or gross recording

26. Two alternative approaches have been suggested to provide this complete accounting. The first takes an approach that introduces into the accounts of the extracting firm a net amount reflecting the difference between the cost of using up the value of the natural resources (the value of extractions) and the value of natural growth – net recording. The second approach records the value of extractions separately from the value of natural growth – gross recording.

27. To consider these approaches note first the underlying physical nature of these flows. From an assumed quantity of resource at the beginning of the period there will be a quantity of extractions and a quantity of natural growth and from these pieces of information a quantity of resources at the end of the period can be determined.

28. Assuming a given set of prices, the value of the natural resource at the end of the period will be lower than at the beginning if the quantity of extractions is higher than natural growth, the value will be higher if extractions are less than natural growth, and unchanged if extractions equal natural growth. Thus we would regard depletion to have occurred if extractions were higher than natural growth and no depletion to have occurred if the quantities were the same and some form of negative depletion if natural growth was higher than extractions.

29. Therefore, in the case of renewable resources we have

$$\text{Depletion} = \text{Extractions} - \text{Natural Growth} \qquad \text{(Equation 7)}$$

Rearranging equation 4

$$\text{Return to natural resources (RNR)} = \text{Resource rent} - \text{Depletion} \qquad \text{(Equation 8)}$$

And then substituting in equation 7 we have the following definition

$$\text{RNR} = \text{Resource rent} - (\text{Extractions} - \text{Natural Growth})$$

= Resource rent – Extractions + Natural Growth (Equation 9)

30.. In accounting terms equation 9 is of particular interest. The return on natural resources can be seen to be composed of

- Returns/additions to income earned through extracting and selling marketed output (net operating surplus in SNA terms)
- additions to income due to natural growth; and
- deductions from income due to extractions.

31. By considering the accounting options for these three flows as either additions or subtractions the treatment of the depletion of renewable resources can be determined.

32. At this point it is worth considering a few scenarios to understand the potential accounting implications.

Scenario 1: If natural growth equals zero. This is the limiting case that arises for non-renewable resources. In this scenario depletion equals the value of extractions and we would show accounting entries for additions (equal to resource rent) and deductions from income (equal to extractions).

Scenario 2: If extractions are equal to natural growth. In this scenario depletion equals zero and the return on natural resources equals resource rent.

Scenario 3: If extractions are greater than natural growth. This is the general case of unsustainable extraction but is also a likely outcome in a practical sense even when extractions and natural growth are at similar levels since the likelihood of extractions exactly equalling natural growth in any given accounting period is low. In this scenario depletion will be a positive number and hence on a net basis of recording this could be regarded as a single deduction from income while resource rent remains the single addition. On the other hand using a gross basis of recording it would be possible to show extractions as a deduction from income and show both resource rent and natural growth as additions. The same result for return on natural resources is derived but the presentation is different.

Scenario 4: If extractions are less than natural growth. As for scenario 3 this is most likely to be a practical outcome when extractions and natural growth are at similar levels but still must be accounted for. In this scenario estimated depletion will be negative. Two accounting alternatives must be considered:

(i) Under a net basis of recording it would be necessary to record a single negative deduction from income, an entry that may be difficult to interpret. One way around this outcome would be to set the deduction from income to be zero by convention and then find an alternative recording for the "excess" natural growth – either as an addition to income or as an other change in volume. If recorded as an addition to income it is observed that this entry would only occur when natural growth was greater than extractions and only the "excess" natural growth would be included. If recorded as an other change in volume it is noted that the resulting return on natural resources would be different from that derived under any other approach.

(ii) Under a gross basis of recording the flows are recorded in the same way as under scenario 3 and hence there are no such presentational issues. Importantly, the value of the return to natural resources is estimated consistently between the different scenarios under a gross basis of recording.

Recommendation: That a gross basis of recording incorporating a value of extractions and a value of natural growth be used to account for the depletion of renewable natural resources.

G. Terminology

33. Under a gross basis of recording there is no single entry representing the overall cost to production from using up natural resources that is the usual understanding of terms such as depletion and depreciation. Rather two terms need to be found to refer to entries on different sides of the accounts. The choice of term to represent the value of extractions is "Consumption of Natural Capital". This value represents the extent to which the value of the resource has declined due solely to the physical removal of the resource during the accounting period. Of course where there has been natural growth this will not be equal to the actual decline in the value of the resource and hence a partitioning of the value change is needed to estimate consumption of natural capital. In this regard it is explicitly noted that there is no entry in the accounts call "depletion" and further, consumption of natural capital does not equal depletion and should not be interpreted in this way for renewable resources.

34. The choice with regard to natural growth is to refer to this flow as "Other non-market output" of the extracting firm. This flow is also reflected as an entry in the capital account as an increase in non-produced non-financial assets thus helping to account for the change in balance sheet positions. There may be some concern that the use of this term does not align with the general scope defined in the 2008 SNA for the entry "Non-market output" (see 2008 SNA paragraph 6.128).

Recommendation: That under a gross basis of recording the value of extractions should be labelled "Consumption of Natural Capital" and that the value of natural growth should be labelled "Other non-market output".

H. Other accounting and measurement issues

The scope of natural growth

35. The term natural growth in this paper has been used to relate to a purely positive flow. In reality, estimates of natural growth must take into account normal losses of resource due to natural mortality and hence the term net natural growth may be more appropriate.

Appearance and disappearance of assets

36. As for all assets there are many ways in which natural resources may appear and disappear from consideration within the SEEA. While for the purposes of understanding extractions and its associated costs the flows of extraction and natural growth are the relevant flows, there are other flows that need to be taken into account in a full accounting of change between the beginning and the end of the period. These include

- Changes in the condition of exploitable mineral and energy reserves (e.g. reductions in the level of proven reserves that reflect changes in technology and relative prices);
- Changes in the quality of economic use from a lower to a higher value (e.g. from grazing land to cultivated land);
- Degradation due to economic activity (e.g. erosion and other damage to land from deforestation or improper agricultural practices, harmful effects on fish stocks from acid rain or excess nutrients from agricultural run-off).
- Catastrophic losses, which may be caused by major earthquakes, tsunami, exceptionally severe cyclones, drought, wild fires and other natural disasters; acts of war, riots and other political events; and technological accidents such as major toxic spills.

37. Such appearances and disappearances need to be accounted for separately and considered in the assessment of the change in the value of the resource over a period such that the

appropriate amount of depletion is estimated. For example, catastrophic losses of forests due to cyclone should not be included in the measure of depletion although clearly they will reduce the value of the resource.

38. A special note is made of changes in the value of assets due to degradation. Degradation may be either an anticipated or an unanticipated consequence of economic activity. Where degradation is anticipated, it should be included as part of consumption of natural capital, again equivalent to the treatment of physical deterioration, normal obsolescence or normal accidental damage in consumption of fixed capital. Where degradation is unanticipated, it should remain as an 'other change' in the volume of the asset. In many cases it will not be possible to identify and partition elements of degradation as either anticipated or unanticipated consequences of production. A practical solution is to record all degradation in the Other changes in volume of assets account, reflecting its character as a negative consequence of production rather than an intended using up of an asset in production.

Valuation of flows

39. While the physical quantities of extraction and natural growth can be relatively easily conceptualised, their values need to be carefully considered. These two flows should not be valued using market prices for output – thus the value of extractions does not equal the value of sales of extracted resource and equally the quantity of natural growth does not add to the resource at the market price. Rather the values of these flows must be considered jointly since their sum must equal the change in the value of the resource – i.e. depletion.

The treatment when extraction is zero

40. The interest in estimating depletion for natural resources, both renewable and non-renewable, is driven from a desire to more comprehensively reflect the full costs of extraction within the traditional production and income accounts of the extraction industries. An implicit assumption in this analysis is that where depletion is recorded there is extraction being undertaken and hence there is income being earned against which any costs of extraction should be recorded. In the case of non-renewable resources this matter has been considered as a special case within the measurement of depletion and the application of net present value approaches. Readers are referred to the outcome paper on Issue #13: Recording of depletion for non-renewable resources for more detail. In summary, the recommendation is that where there is no extraction then no income or depletion should be recorded.

41. For renewable resources the situation may well arise that extraction is suspended or ceased for any variety of reasons. However, unlike the situation for non-renewable resources, natural growth is likely to continue. Under the recommended approach to recording depletion it thus may be the case that amounts of natural growth and hence depletion adjusted operating surplus are recorded in the accounts even though there is no market output or consumption of natural capital recorded during the period. Consistent with the recommendation for non-renewables, it is therefore suggested that if extraction of a renewable resource is zero during an accounting period then any natural growth should be recorded as an other change in volume rather than as other non-market output. This recommendation should be applied taking into account normal patterns of harvesting that will vary by type of natural resource.

References

Integrated Environmental and Economic Accounting, SEEA-2003, http://unstats.un.org/unsd/envaccounting/seea.asp

System of National Accounts, 2008, http://unstats.un.org/unsd/nationalaccount/sna2008.asp

APPENDIX 1:

SNA treatment - Depletion of a renewable natural resource

Information:
Example represents a closed economy with 3 institutional sectors, general government (GG), households (HH), and non-financial corporations (NFC)
Market output by NFC (120) is from sale of wild-caught fish in territorial waters controlled by national general government.
Natural growth of fish (economic appearance) is 15, and harvest (depletion of natural asset) is 40, both recorded in the Other changes to volume of assets account.
Ownership of the natural resource asset is assigned to GG.

1. Production account (2005) $m

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Intermediate consumption	258	23	180	55	Output	434	54	260	120
Gross domestic product	*176*	*31*	*80*	*65*	Market output	234	54	60	120
Consumption of fixed capital	28	6	10	12	Other non-market output	200		200	0
Net domestic product	*148*	*25*	*70*	*53*					

2. Generation of Income account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Compensation of employees	85		60	25	*Net domestic product*	*148*	*25*	*70*	*53*
Net operating surplus	*63*	*25*	*10*	*28*					

3. Allocation of primary income account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Property income	0	0	0	0	*Net operating surplus*	*63*	*25*	*10*	*28*
Interest	0	0	0	0	Compensation of employees	85	85		
National income	*148*	*110*	*10*	*28*					

4. Secondary distribution of income account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Current taxes on income, wealth, etc	25	20		5	*National income*	*148*	*110*	*10*	*28*
Taxes on income	25	20		5	Current taxes on income, wealth, etc	25		25	
					Taxes on income	25		25	
Disposable income	*148*	*90*	*35*	*23*					

5. Use of income disposable account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Final consumption expenditure	81	54	27		*Disposable income*	*148*	*90*	*35*	*23*
Saving	*67*	*36*	*8*	*23*					

6. Capital account (2005)

Changes in assets	Total	HH	GG	NFC	Changes in liabilities and net worth	Total	HH	GG	NFC
Gross fixed capital formation	54	20	14	20	*Saving*	*67*	*36*	*8*	*23*
Acquisition less disposal of fixed assets	54	20	14	20					
Additions to the value of non-produced non-financial assets	0								
Consumption of fixed capital	-28	-6	-10	-12					
Changes in inventories	2			2					
Net lending (+)/Net borrowing (-)	39	*22*	*4*	*13*	*Changes in net worth due to savings and capital transfers*	*67*	*36*	*8*	*23*

7. Financial account (2005)

Changes in assets	Total	HH	GG	NFC	Changes in liabilities and net worth	Total	HH	GG	NFC
Net acquisition of financial assets	39	22	4	13	Net incurrence of liabilities	0	0	0	0

Currency and deposits	39	22	4	13	Accounts payable	0			0
Currency	39	22	4	13	Trade credits and advances	0			0
					Net lending (+)/Net borrowing (-)	*39*	*22*	*4*	*13*

8. Other changes in volume of assets account (2005)

Changes in assets	Total	HH	GG	NFC	Changes in liabilities and net worth	Total	HH	GG	NFC
Non-financial assets	-25	0	-25	0	Liabilities	0	0	0	0
Produced assets									
Non-produced assets	-25	0	-25	0					
Economic appearance	15		15						
Natural growth of non-cultivated biological resources	15		15	0					
Economic disappearance of non-produced assets	-40		-40	0					
Depletion of natural assets	-40		-40	0					
Other economic disappearance									
Catastrophic losses									
Other volume changes									
					Changes in net worth due to other changes in volume of assets	-25	0	-25	0

9. Balance sheets: Opening balance sheet 1 January 2005

Assets	Total	HH	GG	NFC	Liabilities and net worth	Total	HH	GG	NFC
Non-financial assets	304	45	184	75	Liabilities	116	23	17	76
Produced assets	188	45	68	75	Loans	61	23	17	21
Fixed assets	185	45	68	72	Shares and other equity	48			48
Inventories	3			3	Other accounts payable	7			7
Non-produced assets	116	0	116	0					

Financial assets	121	64	37	20					
Currency and deposits	121	64	37	20					
					Net worth	*309*	*86*	*204*	*19*

10. Balance sheets: Changes in balance sheet 2005

Assets	Total	HH	GG	NFC	Liabilities and net worth	Total	HH	GG	NFC
Total changes in assets	42	36	-17	23	Total changes in liabilities	0	0	0	0
Non-financial assets	3	14	-21	10	Liabilities				0
Produced assets	28	14	4	10	Loans				
Fixed assets	26	14	4	8	Shares and other equity				
Inventories	2	0	0	2	Other accounts payable				0
Non-produced assets	-25	0	-25	0					
Financial assets	39	22	4	13					
Currency and deposits	39	22	4	13					
					Changes in net worth, due to:	*42*	*36*	*-17*	*23*
					Saving and capital transfers	*67*	*36*	*8*	*23*
					Other changes in volume of assets	*-25*	0	-25	0

11. Balance sheets: Closing balance sheet 31 December 2005

Assets	Total	HH	GG	NFC	Liabilities and net worth	Total	HH	GG	NFC
Non-financial assets	307	59	163	85	Liabilities	116	23	17	76
Produced assets	216	59	72	85	Loans	61	23	17	21
Fixed assets	211	59	72	80	Shares and other equity	48	0	0	48
Inventories	5	0	0	5	Other accounts payable	7	0	0	7
Non-produced assets	91	0	91	0					
Financial assets	160	86	41	33					
Currency and deposits	160	86	41	33					

					Net worth	*351*	*122*	*187*	*42*

APPENDIX 2:

SEEA treatment - Depletion of a renewable natural resource

Information:

Example represents a closed economy with 3 institutional sectors, general government (GG), households (HH), and non-financial corporations (NFC)

Market output by NFC (120) is from sale of wild-caught fish in territorial waters controlled by national general government.

Natural growth of fish (other non-market output), 15, and harvest (consumption of natural capital), 40 are assigned to the NFC as the producer unit.

Legal ownership of the natural resource asset is with GG, but as NFC is the beneficial owner the asset is assigned to the NFC.

Numbers in red show changes compared with SNA treatment.

1. Production account (2005) $m

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Intermediate consumption	258	23	180	55	Output	449	54	260	135
Gross domestic product	*191*	*31*	*80*	*80*	Market output	234	54	60	120
Consumption of fixed capital	28	6	10	12	Other non-market output	215		200	15
Consumption of natural capital	40			40					
Net domestic product	*123*	*25*	*70*	*28*					

2. Generation of Income account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Compensation of employees	85		60	25	*Net domestic product*	*123*	*25*	*70*	*28*
Net operating surplus	*38*	*25*	*10*	*3*					

3. Allocation of primary income account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC

Property income	0	0	0	0	*Net operating surplus*	*38*	*25*	*10*	*3*
Interest	0	0	0	0	Compensation of employees	85	85		
National income	*123*	*110*	*10*	*3*					

4. Secondary distribution of income account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Current taxes on income, wealth, etc	25	20		5	*National income*	*123*	*110*	*10*	*3*
Taxes on income	25	20		5	Current taxes on income, wealth, etc	25		25	
					Taxes on income	25		25	
Disposable income	*123*	*90*	*35*	*-2*					

5. Use of income disposable account (2005)

Uses	Total	HH	GG	NFC	Resources	Total	HH	GG	NFC
Final consumption expenditure	81	54	27		*Disposable income*	*123*	*90*	*35*	*-2*
Saving	*42*	*36*	*8*	*-2*					

6. Capital account (2005)

Changes in assets	Total	HH	GG	NFC	Changes in liabilities and net worth	Total	HH	GG	NFC
Gross fixed capital formation	69	20	14	35	*Saving*	*42*	*36*	*8*	*-2*
Acquisition less disposal of fixed assets	54	20	14	20					
Additions to the value of non-produced non-financial assets	15			15					
Consumption of fixed capital	-28	-6	-10	-12					
Consumption of natural capital	-40			-40					
Changes in inventories	2			2					

Net lending (+)/Net borrowing (-)	39	*22*	*4*	*13*	*Changes in net worth due to savings and capital transfers*	*42*	*36*	*8*	*-2*

7. Financial account (2005)

Changes in assets	Total	HH	GG	NFC	Changes in liabilities and net worth	Total	HH	GG	NFC
Net acquisition of financial assets	39	22	4	13	Net incurrence of liabilities	0	0	0	0
Currency and deposits	39	22	4	13	Accounts payable	0			0
Currency	39	22	4	13	Trade credits and advances	0			0
					Net lending (+)/Net borrowing (-)	*39*	*22*	*4*	*13*

8. Other changes in volume of assets account (2005)

Changes in assets	Total	HH	GG	NFC	Changes in liabilities and net worth	Total	HH	GG	NFC
Non-financial assets	0	0	0	0	Liabilities	0	0	0	0
Produced assets									
Non-produced assets	0	0	0	0					
Economic appearance									
Natural growth of non-cultivated biological resources	0	0	0	0					
Economic disappearance of non-produced assets	0	0	0	0					
Depletion of natural assets	0	0	0	0					
Other economic disappearance									
Catastrophic losses									
Other volume changes									
					Changes in net worth due to other changes in volume of assets	*0*	0	0	0

9. Balance sheets: Opening balance sheet 1 January 2005

Assets	Total	HH	GG	NFC	Liabilities and net worth	Total	HH	GG	NFC

Non-financial assets	304	45	68	191	Liabilities	116	23	17	76
Produced assets	188	45	68	75	Loans	61	23	17	21
Fixed assets	185	45	68	72	Shares and other equity	48			48
Inventories	3	0	0	3	Other accounts payable	7			7
Non-produced assets	116	0	0	116					
Financial assets	121	64	37	20					
Currency and deposits	121	64	37	20					
					Net worth	*309*	*86*	*88*	*135*

10. Balance sheets: Changes in balance sheet 2005

Assets	Total	HH	GG	NFC	Liabilities and net worth	Total	HH	GG	NFC
Total changes in assets	42	36	8	-2	Total changes in liabilities				0
Non-financial assets	3	14	4	-15	Liabilities				0
Produced assets	28	14	4	10	Loans				
Fixed assets	26	14	4	8	Shares and other equity				
Inventories	2	0	0	2	Other accounts payable				0
Non-produced assets	-25	0	0	-25					
Financial assets	39	22	4	13					
Currency and deposits	39	22	4	13					
					Changes in net worth, due to:	*42*	*36*	*8*	*-2*
					Saving and capital transfers	*42*	*36*	*8*	*-2*
					Other changes in volume of assets	*0*	0	0	0

11. Balance sheets: Closing balance sheet 31 December 2005

Assets	Total	HH	GG	NFC	Liabilities and net worth	Total	HH	GG	NFC
Non-financial assets	307	59	72	176	Liabilities	116	23	17	76
Produced assets	216	59	72	85	Loans	61	23	17	21

Fixed assets	211	59	72	80	Shares and other equity	48	0	0	48
Inventories	5	0	0	5	Other accounts payable	7	0	0	7
Non-produced assets	91	0	0	91					
Financial assets	160	86	41	33					
Currency and deposits	160	86	41	33					
					Net worth	351	*122*	*96*	*133*