

Remote Meeting  
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**WS.6 Accounting for the Economic Ownership and Depletion of Natural  
Resources**



## Wellbeing and Sustainability Task Team

### WS.6 Accounting for the Economic Ownership and Depletion of Natural Resources<sup>1</sup>

#### Summary of testing

- A questionnaire was drafted to determine the feasibility of obtaining information on **(i) splits of the economic ownership of natural resource assets between the government and non-government sectors and (ii) recording appearances and changes in asset ownership** [Annex 2]. The recommendation to record depletion as a cost of production was not covered during this exercise as this represents only a change in the recording (from other changes in assets to production) of an existing flow (presently K21).
- **Testing was conducted using two small groups:** Group 1 comprised three countries that currently compile natural resource stock estimates and which were directly involved (Australia, Canada, and Norway), while Group 2 comprised five developing countries (Guyana, Liberia, Mauritania, Nigeria, and Senegal) for which the IMF compiled estimates using available country data.
- **Estimates for Group 1 countries were made on the basis of data held by and/or known to the NSOs.** Contrastingly, **estimates for Group 2 countries were made mainly using detailed fiscal and public Field Development Plan data and projections** generated during IMF technical assistance to non-NSO government ministries on fiscal regime design and revenue forecasting<sup>2</sup>, though NSOs should have access to such data and be able to create similar projections using appropriate forward assumptions.
- **Overall, estimates of resource rents, sector splits and changes in ownership were found to be possible in both groups.** Importantly, the likely existence of detailed time series data in low- and lower-middle-income countries implies such estimates are feasible even in less sophisticated/comprehensive statistical frameworks.
- **For all countries, time series estimates of resource rent splits could be derived using the SEEA resource rent formula.**<sup>3</sup> The draft questionnaire defined splits solely between government (S.13) and Private Non-Financial Corporations (S.11), which did not reflect additional ownership rights held by the household sectors (aboriginal/first nations) in Australia and Canada. However, in both cases these further splits could be derived and presented for in a modified reporting framework.

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<sup>1</sup> Available at:

[https://unstats.un.org/unsd/nationalaccount/aeg/2020/M14\\_6\\_2\\_Accounting\\_Economic\\_Ownership\\_Depletion\\_Natural\\_Resources.pdf](https://unstats.un.org/unsd/nationalaccount/aeg/2020/M14_6_2_Accounting_Economic_Ownership_Depletion_Natural_Resources.pdf)

<sup>2</sup> Using the IMF's [Fiscal Analysis of Resource Industries \(FARI\)](#) modelling framework.

<sup>3</sup> SEEA-CF, Table 5.5.

- **Group 1 respondents all agreed estimates of resource rent splits were feasible, and overall, the results were thought to be meaningful, or in some instances could become meaningful** subject to additional data collection and analysis by commodity. All agreed that assumptions could be used to make forward estimates of resources not yet subject to extraction and the distribution of future resource rent streams to generate the net present value estimates required to determine splits in economic ownership of natural resource assets.

**Table 1: Estimates of natural resource rent splits by country**

Sector splits %	Group A <sup>1</sup>			Group B <sup>2</sup>				
	Australia	Canada	Norway	Guyana	Liberia	Mauritania <sup>3</sup>	Nigeria	Senegal <sup>3</sup>
S.13	31.0	42.6	82.4	43.9	37.0	70.1	19.7	44.7
S.11	69.0	57.4	17.6	56.1	63.0	29.9	80.3	-144.7

Notes:

1 Based on country-specific timespans as reported for testing purposes rather than full potential time series.

2 Based on expected total project timespans as compiled in the IMF FARI framework, comprising historical values for exploration and evaluation and projections to project termination, including terminal costs.

3 Results are based on a joint extraction area but with different fiscal regimes and future assumptions by national authorities. This results in estimates showing it as a loss-making project for the extractor in Senegal in all periods but only loss-making in some periods in Mauritania.

- **The Group in general preferred to record changes in the effective ownership of a natural resource as ‘an other change in volume’.** Australia and Canada preferred to record both initial appearances and subsequent changes in effective ownership as other changes in volumes, while Norway preferred to record a capital transfer from S.13 to S.11 at the start of extraction and then record any subsequent changes in ownership as other changes in volumes. There was debate on whether an asset’s economic appearance is only at the point when economic viability and hence financial arrangements and ownership rights are established, which would support splitting assets from the outset.
- **The impact on the sequence of accounts of a change in asset ownership recorded as other changes in the volume of assets would result in no changes in net/lending/borrowing by sector and overall.** Annex 1 reuses WS.6 Example D - with depletion recorded as a cost of production - to show combined T-tables for S.11 and S.13 where the change in asset ownership is (1) recorded as capital transfers (as already shown separate T-tables in WS.6); and (2) recorded as other changes in the volume of assets.

### **Issues identified during testing**

- Data on the resource income flowing to government can be incomplete and the actual arrangements made between governments (in the various jurisdictions) and the mining industry may not always be well understood (particularly Group 2).
- Careful consideration is needed to account for all revenues flowing from extractors to government, including possible sur-taxes on corporate profits and dividends paid out by public corporations, in line with the guidance provided in GN WS.14.
- Price fluctuations were observed to create major instability in resource rent shares over time, something that should be countered following the guidance provided in GN WS.10.

- GFS data may not allow us to differentiate the royalties receivable by government by commodity (mining output) which complicates estimating the ownership split at the (mineral) resource level.
- Compiling full-fledged natural resource accounts may require some estimation, particularly when recording the pro-rated extraction element in the asset account of government which does not act as extractor.

### **Recommendations**

- Based on the results of the testing exercise, it is recommended that:
  - 1) Economies record natural resource assets both to the government as the legal owner and to the extractor as the economic owner based (in principle) on the resource rent methodology proposed by the SEEA – that is, apply a split asset approach, where economic ownership is apportioned in line with the actual distribution of resource rents and sharing of operational risks.
  - 2) Information on the corresponding balance sheets of governments and non-financial corporations (and any other sectors) should be incorporated to give a more accurate reflection of sector net worth.
  - 3) Initial appearances of natural resource assets should be recorded as other changes in the volume of assets rather than as capital transfer.
  - 4) While respecting any related final guidance set out in already endorsed GNs (specifically, WS.6, WS.8, WS.10 and WS.11), further consultations with the wider GFS and SEEA communities should take place in advance of the next AEG meeting to help reach final conclusions.

### **Questions for the AEG**

- Does the AEG share the tentative conclusions of the Group on the feasibility of splitting natural resource ownership?
- Does the AEG agree with the use of average resource rent shares to split the asset values?
- Does the AEG support the view that the economic appearance of an asset is concurrent with financial arrangements and ownership rights being established, or does it consider that these events may be distinct?
- Does the AEG agree with the recording of a natural resource ownership change amongst sectors as an other change in the volume of assets or would it prefer the recording of a capital transfer?
- Does the AEG support recording changes in royalty regimes as an other change in the volume of assets or would it prefer the recording of a capital transfer?

## Annex 1: Impacts of recording a change in asset ownership as (1) capital transfers or (2) other changes in the volume of assets

### (1) Change in asset ownership recorded as capital transfers

Production and generation of income account							
	Total	S.11	S.13		Total	S.11	S.13
Compensation of Employees	35	35	0	Output	100	100	0
Consumption of fixed capital	20	20	0				
Depletion/degradation of nat. res	45	45	0				
Net operating surplus	0	0	0				

  

Distribution of income account							
	Total	S.11	S.13		Total	S.11	S.13
				Net operating surplus	0	0	0
Rent	30	30		Rent	30		30
Depletion/degradation borne by govt.	-30	-30		Depletion/degradation borne by govt.	-30		-30
Net saving	0	0	0				

  

Capital account							
	Total	S.11	S.13		Total	S.11	S.13
Acquisition of assets	0	250	-250	Net saving	0	0	0
Consumption of fixed capital	-20	-20	0	Net capital transfers received	0	250	-250
Depletion/degradation of nat. res	-45	-15	-30				
Net lending/borrowing	65	35	30	Changes in NW due to saving and CT	0	250	-250

  

Financial account							
	Total	S.11	S.13		Total	S.11	S.13
Cash	65	35	30	Net lending/borrowing	65	35	30

  

Other changes in the volume of assets account							
	Total	S.11	S.13		Total	S.11	S.13
Depletion/degradation of nat. res	0	0	0	(Dis)appearance, or other ch. n.e.c.	0	0	0
Changes in NW due to OCVA	0	0	0				

  

Balance sheet													
	Total		S.11		S.13			Total		S.11		S.13	
	Opening	Closing	Opening	Closing	Opening	Closing		Opening	Closing	Opening	Closing	Opening	Closing
Cash	0	65	0	35	0	30	Net worth	950	950	200	450	750	500
Fixed assets	200	180	200	180	0	0							
Natural resources (or permits)	750	705	0	235	750	470							
Total	950	950	200	450	750	500	Total	950	950	200	450	750	500

(2) Change in asset ownership recorded as other changes in the volume of assets

Production and generation of income account													
	Total	S.11	S.13		Total	S.11	S.13						
Compensation of Employees	35	35	0	Output	100	100	0						
Consumption of fixed capital	20	20	0										
Depletion/degradation of nat. res	45	45	0										
Net operating surplus	0	0	0										
Distribution of income account													
	Total	S.11	S.13		Total	S.11	S.13						
				Net operating surplus	0	0	0						
Rent	30	30		Rent	30		30						
Depletion/degradation borne by govt.	-30	-30		Depletion/degradation borne by govt.	-30		-30						
Net saving	0	0	0										
Capital account													
	Total	S.11	S.13		Total	S.11	S.13						
Acquisition of assets	0	0	0	Net saving	0	0	0						
Consumption of fixed capital	-20	-20	0	Net capital transfers received	0	0	0						
Depletion/degradation of nat. res	-45	-15	-30										
Net lending/borrowing	65	35	30	Changes in NW due to saving and CT	0	0	0						
Financial account													
	S.1	S.11	S.13		S.1	S.11	S.13						
Cash	65	35	30	Net lending/borrowing	65	35	30						
Other changes in the volume of assets account													
	Total	S.11	S.13		Total	S.11	S.13						
Depletion/degradation of nat. res	0	0	0	(Dis)appearance, or other ch. n.e.c.	0	250	-250						
Changes in NW due to OCVA	0	250	-250										
Balance sheet													
	Total		S.11		S.13			Total		S.11		S.13	
	Opening	Closing	Opening	Closing	Opening	Closing		Opening	Closing	Opening	Closing	Opening	Closing
Cash	0	65	0	35	0	30	Net worth	950	950	200	450	750	500
Fixed assets	200	180	200	180	0	0							
Natural resources (or permits)	750	705	0	235	750	470							
Total	950	950	200	450	750	500	Total	950	950	200	450	750	500

## Annex 2: Testing exercise questionnaire

January 2023  
version 0.6

# Split of Natural Resource Ownership - testing exercise questionnaire - Supplementing GN WS.6

## INTRODUCTION

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The results of the global consultation of GN WS.6 on 'Accounting for the Economic Ownership and Depletion of Natural Resources' were presented at the AEG of October 2021. The consultation showed that both proposals: (1) recording of depletion as a cost of production (similar to CFC) and (2) the split of economic ownership between the government and the extractor, were supported by the majority of the respondents.

As a follow up, the AEG asked the Well-being and Sustainability Task Team (Environmental Accounting Sub-Task Team) to test the split asset approach to determine whether the recommendation can be implemented in practice and how to best record the flows of the asset from government to the extractor. This questionnaire is designed to assist participating countries to collect the necessary data, split the natural resource asset between government and extractor and record the transactions.

The goal of the analysis is not to test the compilation of natural resource stock values, as this is already part of the 2008 SNA and SEEA-CF standards. Instead, the analysis should show:

- a. that allocating the streams of resource rents (now and in the future) to government and to the extractor can be achieved with an acceptable level of quality.
- b. and that this information can be used to allocate natural resource stocks between the government sector (S.13) and the non-financial corporations sector (S.11) and be recorded on their corresponding balance sheets and be reflected in net worth.

Responding countries may select the natural resource assets most appropriate for their circumstances. Obviously, the test is only meaningful for those resources of which the revenues are apparently flowing to both government and natural resource companies. The evidence so far shows that this is often the case.

Responding countries are equally given the flexibility to conduct the analysis at the national, the regional or natural resource project level. A test at the level of an individual project may already provide satisfactory evidence of feasibility, however it may disclose information on individual mining companies, which may be a drawback.



The questionnaire is designed in two parts. The first questions relate to the various revenue and payments streams available to estimate the asset values and then split those between government (S.13) and non-financial (extracting) corporations (S.11). The second set of questions relate to the recording of the natural resource asset positions in their existing balance sheet accounts. Two different recording methods are proposed – the capital transfer method (as outlined in the guidance note) and a volume change method also proposed in the guidance note.

This testing exercise is based on the assumption that the depletion of natural resources will be recorded as recommended in the guidance note.

## STEP 1 – SPLITTING THE ASSET VALUES BETWEEN GOVERNMENT AND NON-FINANCIAL CORPORATIONS

Please indicate the kinds of natural resources examined and at which regional level the examination is undertaken.

1.1 Please specify the examined natural resource(s).	
1.2 Please specify the scope of the examination: country level, region level, mining project level	
1.3 Do your testing estimates (implicitly) include deposits which are not yet subject to extraction?	

The formula to calculate resource rent as set out in GN WS.6 follows the SEEA-CF approach (Table 5.5: the table is attached as Annex to the questionnaire). This table shows that specific net taxes (minus specific subsidies) should be included in the resource rent and regular net taxes are excluded. Specific taxes and subsidies are those that apply solely to the extracting enterprises and are not generally applicable across the economy. Examples include subsidies provided based on the quantity of resources sold and taxes levied solely on inputs used the extracting industries<sup>4</sup>. These specific taxes are one way by which governments are appropriating the resource rent<sup>5</sup>.

In the national accounts, the appropriation of the resource rent by government can take form in a variety of transactions. Could you identify the different ways and the amount of natural resource rent collected by government from natural resource extractors (preferably for a longer range of years) by completing the table below. The transaction types in the table below are indicative. Please adjust as considered appropriate and please motivate your choices.

1.4 apportioning the resource rent between the government and the extractor					
	Year 1	Year 2	Year 3	Year 4	Etc.

<sup>4</sup> Other examples include differences in specific rates of regular taxes and/or subsidies levied on extractors – e.g., if an extractor pays a higher rate  $Y$  of tax on profits versus a standard rate of  $X$ , then  $(Y - X) \times Profit$  should be included in the resource rent calculation.

<sup>5</sup> In fact, one may argue that these flows should not be classified as taxes at all but instead be included as resource rent accruing to the government.

1. Resource rent					
2.a Specific taxes (minus subsidies) on extraction					
2.b Royalty payments					
2.c Specific corporate taxes					
2.d Rent Payments					
2.e Resource lease payments					
2.f ..					
2.g					
2.h					
2.i					
3. Government share: $\sum(2.a - 2..)$					
4. Non-financial corporations share: 1 – 3					

Could you answer the following questions related to the vehicles governments use to collect resource rent from extractors in your country.

1.5 How would you evaluate the variability in time of the government share? Would it allow for estimating the allocation of future income streams?	
1.6 Are some of the royalty payments or other rent components fixed amounts or are they related to either the extractor's earnings, the resource's price or the quantities extracted (so-called stratified or tiered levying systems)?*	
1.7 Are some of these payments lumpsum, requiring a time allocation?	
1.8 Do you encounter for certain years negative resource rents and does this in your opinion complicate the resource rent allocation?	

\* In case average royalty rates depend on the amounts extracted, natural resource asset accounts in physical units would probably represent useful supplementary information, also with respect to assessing the distribution of future earnings and how these are affected by expected future extraction levels.

The proposal is to use the ex-post information on resource rent allocation in table 1.3 to split the future stream of the resource's income into two separate net present value calculations, leading to two separate assets, one to be recorded in balance sheets of government and the second in the balance sheet of the mining company (non-financial corporations).

1.9 Please complete the following table. This table follows the monetary asset accounts (SEEA-CF, Table 5.9) for the natural resource(s)? Only the first item is needed for the purpose of this test. Complete other items if available.			
Reference year: 20XX Accounting unit: (\$, €, £, ...)	Non-financial corporations sector S.11	Government sector S.13	Households sector S.14*
Opening value of stock of resources			
Total additions to stock			
Discoveries			
Upward reappraisals			
Reclassifications			
Total reductions in stock			
Extractions			
Catastrophic losses			
Downward reappraisals			
Reclassifications			
Revaluations			
Closing value of stock of resources			

\* Please note that households, as the traditional owners in specific jurisdictions, may be entitled to royalty payments and should for that reason be identified as economic owner. Also, households may be engaged in the extraction of natural resources (unincorporated businesses, S.14). Please be aware that deriving a resource rent from household's mixed income requires not only measuring the user costs of fixed assets but also the value of the labor input of self-employed household members.

1.10 Do you think the asset split is practically feasible?	
1.11 Do you think it leads to meaningful results?	

1.12 If your answer to question 1.3 is yes, would you be able to make assumptions about (a) the future extraction of natural resources not yet subject to operation as well as (b) the distribution of their future resource rents streams? Please explain.	
1.13 Does your testing results also address mining activities conducted by the sector households (S.14). If so, please explain how in such cases resource rents and their split are being calculated.	

## STEP 2 – RECORDING OF APPEARANCES AND CHANGES IN ASSET OWNERSHIP

### Recording the initial appearance

One implication of splitting natural resource wealth between government and extractor is the perception that the government is giving away public wealth. According to para 10.204 of the 2008 SNA, the event of giving away an asset needs to be recorded as a capital transfer in kind. Such a recording would imply that there is a moment in time in which the full value of the natural resource is found in the balance sheet of government.

The 2008 SNA recommended net present value method for recording natural resource assets implicates that we can only account for natural resource assets once knowledge is obtained about their extraction and the expected revenue stream can be estimated. Without this information on expected future resource rent flows, the calculation of net present values is precluded.

Prior to the onset of extraction, there was very likely several years of mineral exploration and other preparatory work that should have been appropriately recorded under supply (either production or imports) and use (GFCF). These expenditures can be substantive. Such amounts are only invested when the extractors have obtained information (guarantees) from the government about the expected underlying financial arrangements i.e., how the future income to be obtained from the mine will be shared between the government and the mining company. A tentative conclusion could be that at the point in time when information becomes available about future extraction paths, the appearance of the asset would proportionally occur in the balance sheets of government and extractor based on the arrangements made. Under such conditions, a transfer of public wealth could not have taken place, as there was never a moment in time in which the government fully owned the entire asset.

### Recording changes in extraction arrangements

After the initial agreement, the extraction arrangements of mineral assets between governments and extractors may change over time which can lead to a potential capital transfer. There may be situations in which the government extracts less resource rent than under the previous arrangement and therefore de facto transfers some of the natural resource asset to the mining company. Alternatively, the government is able to obtain from one year to another a larger portion of the resource rent than under the previous arrangement. This would de facto imply a capital transfer from the mining company to government. However, it could also be argued that the latter case did not take place under mutual agreement amongst the parties and therefore may not be a capital transfer but rather an other volume change.

Please respond to the following questions including any relevant dates and specific details on revisions to resource sharing arrangements and transactions.

2.1 Could you please explain how the appearance of the natural resource(s) under consideration should have been accounted for?	
2.2 Have there been events* which would in your opinion require recording the transfer of a natural resource? Events could be: <ul style="list-style-type: none"> <li>• The asset value firstly appeared in the government balance sheet and was later (partly) transferred to its extractor.</li> <li>• Changes in resource rent allocation arrangements require the recording of a resource transfer. This could go both ways: government → extractor or vice versa.</li> </ul>	

If the answer to 2.2 is yes, would you be able to populate the tables below for this event or these events?

2.3 OPTION 1 - A capital account recording (2008 SNA, 10.204)	Extractor (S.11)	Government (S.13)
Capital transfer, receivable	X	
Capital transfer, payable		X
Acquisitions of non-produced assets	X	
Disposal of non-produced assets		X

2.4 OPTION 2 - A recording as other changes in the volume of assets capital account recording (2008 SNA, 12.17 and further)	Extractor (S.11)	Government (S.13)
Economic appearance of assets, or, other changes (+) in volume n.e.c.	X	
Economic disappearance of assets, or, other changes (-) in volume n.e.c.)		X

2.5 Which of these two recording options would have your preference? Please explain why?	
2.6 Perhaps you would like to suggest yet another recording solution?	

## ANNEX – RESOURCE RENT FORMULA

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**Output** (sales of extracted environmental assets at basic prices, includes all subsidies on products, excludes taxes on products)

*Less* Operating costs

Intermediate consumption (input costs of goods and services at purchasers' prices, including taxes on products)

Compensation of employees (input costs for labour)

**Other taxes on production plus other subsidies on production**

*Equals* **Gross operating surplus—SNA basis<sup>a</sup>**

*Less* **Specific subsidies on extraction**

*Plus* **Specific taxes on extraction**

*Equals* **Gross operating surplus—for the derivation of resource rent**

*Less* **User costs of produced assets**

Consumption of fixed capital (depreciation) + return to produced assets

*Equals* **Resource rent**

Depletion + net return to environmental assets<sup>b</sup>

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Source: SEEA-CF, Table 5.5