INTERNATIONAL MONETARY FUND

GUIDE TO ANALYZE NATURAL RESOURCES IN NATIONAL ACCOUNTS

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EXECUTIVE SUMMARY

This *Guide to Analyze Natural Resources in the National Accounts (The Guide)* presents and explains a set of standard Template Tables using the concepts recommended in the United Nations' *System of National Accounts 2008* (*2008 SNA*). Economic activity associated with natural resources is macro-critical for about 30 percent of Fund member countries. Nevertheless, the available data on natural resources to guide policymaking and assess economic performance have often been limited. The Template Tables will guide compilation of national accounts for natural resources, and provide indicators for understanding the macroeconomic impact of changes in natural resource output and prices. Also, as part of the initiatives to develop national accounts beyond GDP, *The Guide* goes beyond production and covers other areas such as income, financing, labor, terms of trade, and depletion. It also takes into account Goal 5 of the UN Sustainable Development Goals (gender equality) by showing employment by gender.

The Guide is consistent with, and builds upon, the *Template to Collect Data on Government Revenues from Natural Resources* (*GFS Template*) by expanding coverage to the full suite of economic units and macroeconomic accounts. It also addresses the broader range of analytical questions that arise in national accounts.

The Guide has been field tested with a diverse range of stakeholders, including statistical compilers. Country tables will be made available on the Fund's website with the authorities' consent. The Statistics Department will collaborate with selected area department teams and other stakeholders to implement *The Guide* in countries, as appropriate.

This project was supported by the Managing Natural Resource Wealth-Topical Trust Fund (MNRW-TTF) with funding provided by Australia, the European Union, Kuwait, the Netherlands, Norway, Oman, and Switzerland.

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Glossary

2008 SNA	*System of National Accounts 2008*
CPC	Central Product Classification
CPI	Consumer Price Index
EITI	Extractive Industries Transparency Initiative
GFS	Government Finance Statistics
ISIC	International Standard Industrial Classification of All Economic Activities
MNRW-TTF	Managing Natural Resource Wealth Topical Trust Fund
PPI	Producer Price Index
SEEA-CF	*System of Environmental-Economic Accounting 2012–Central Framework*
The Guide	*The Guide to Analyze Natural Resources in the National Accounts*
VAT	Value Added Tax

INTRODUCTION[1]

1. The *Guide to Analyze Natural Resources in the National Accounts* (*The Guide*) presents a set of Template Tables that show national accounts statistics on natural resources in a standard format. Economic activity associated with natural resources is considered macro-critical in about 30 percent of the Fund's member countries.[2] *The Guide* will aid in the compilation of national accounts and in macroeconomic analysis of natural resources The natural resources covered are those extracted and sold by the mining industries, including oil and gas.

2. The Template Tables use the concepts recommended in the United Nations' *System of National Accounts 2008* (*2008 SNA*). This facilitates comparisons of the natural resource industries with other parts of the economy and comparisons across economies. Also, as part of initiatives to develop national accounts beyond GDP, *The Guide* goes beyond production and covers other areas such as income, financing, labor, terms of trade, and depletion. It takes into account Goal 5 of the UN Sustainable Development Goals (gender equality) by showing employment by gender. *The Guide* is complemented by the *System of Environmental-Economic Accounting 2012–Central Framework* (*SEEA-CF*, United Nations and others, 2014). The *SEEA-CF* covers measures of environmental assets such as pollution and physical stocks of natural resources such as oil reserves.

3. The management of natural resources is an important function of government, and statistics are needed to support analysis of macroeconomic impacts of natural resources. For countries that rely heavily on natural resources, fluctuations in government revenues, exports, employment, and national income caused by changes in the output and prices of natural resources have major macroeconomic and fiscal implications. Sound policymaking when such risks are present requires accurate, timely, and complete coverage of relevant industries in the national accounts and analytical measures to assess the macroeconomic effects.

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[1] This project was directed by Claudia Dziobek and Robert Dippelsman and reviewed by Michael Davies, Robert Heath, and Gabriel Quiros. Valuable comments were provided by Sagé De Clerck, Jemma Dridi, Segismundo Fassler, Rodrigo Garcia-Verdu, Dominique Guillaume, Clementina Ivan-Ungureanu, Alberto Jiménez de Lucio, Gary Jones, Gregory Legoff, Oana Luca, Maria Mantcheva, Lisbeth Rivas, Randa Sab, Alpa Shah, Bob Traa, and participants in the Fund's Forum for Resource-Rich Economies (FRRE). *The Guide* also benefited from advice by Ann Lisbet Brathaug (Statistics Norway), Erdenesan Eldev-Ochir (National Statistics Office of Mongolia), Alain Gallais (National Institute of Statistics and Economic Studies, France), Sanjiv Mahajan (Office for National Statistics, United Kingdom), Jonas Moberg and Jürgen Reitmaier (Extractive Industries Transparency Initiative), Paul Roberts (Australian Bureau of Statistics), Riana Willemse (South African Reserve Bank), and members of the United Nations Advisory Expert Group on National Accounts. Colleagues of national statistical offices from Kyrgyz Republic, Lesotho, Mongolia, Sierra Leone, and Zambia assisted by completing draft versions of the Template Tables. This project was supported by the Managing Natural Resource Wealth Topical Trust Fund (MNRW-TTF) with funding provided by Australia, the European Union, Kuwait, the Netherlands, Norway, Oman, and Switzerland.

[2] See *Fiscal Regimes for Extractive Industries: Design and Implementation,* http://www.imf.org/external/np/pp/eng/2012/081512.pdf, and *Macroeconomic Policy Frameworks for Resource Rich Developing Countries*, http://www.imf.org/external/np/pp/eng/2012/082412.pdf. A list of 51 countries where natural resources are macro-critical is in *The Commodities Roller Coaster: A Fiscal Framework for Uncertain Times," Fiscal Monitor*, October 2015, http://www.imf.org/external/pubs/ft/fm/2015/02/fmindex.htm.

4. *The Guide* is designed to meet multiple purposes. Data are shown at a relatively high level of aggregation, but the structure can be expanded to include data with greater granularity to support specific user needs. The Template Tables can also be partially completed when countries find that some of the lines in the Template Tables do not apply to them or source data are not available to compile these data. In addition, the statistics covered here can provide context for the reports countries submit to the Extractive Industries Transparency Initiative (EITI).

5. *The Guide* serves as a companion to the *Template to Collect Data on Government Revenues from Natural Resources (GFS Template).* The Fund has published the *Template to Collect Data on Government Revenues from Natural Resources*[3] (or *GFS Template*) to guide the collection and presentation of data on government revenues. Definitions of natural resource industries and products are aligned with those of the *GFS Template*. However, a broader range of questions arise in the national accounts and these require a longer list of products. For example, in measuring output of the natural resource industries, the Template Tables include construction of fixed assets for extraction of natural resources such as oil wells. These are not needed for the *GFS Template*.

6. *The Guide* is the result of extensive consultation with stakeholders. A draft was posted on the Fund's external website and comments from many stakeholders were incorporated as acknowledged in Footnote 1. Feedback was received during the meeting of the United Nation's Advisory Expert Group on National Accounts in April 2016, a meeting with the EITI Secretariat during April 2016, and a presentation at the Ulaanbaatar City Group on Natural Resources in September 2016. *The Guide* was also presented at the International Association for Research in Income and Wealth (IARIW) conference held in Dresden, Germany (August 2016).

7. *The Guide* has been tested in nine countries. Desk studies and field tests have been conducted in countries with varying levels of statistical development. Field tests were conducted in Kyrgyz Republic, Mongolia, Mozambique, and Sierra Leone and desk studies were conducted for Australia, Canada, Chile, Lesotho, and Zambia. These have demonstrated *The Guide's* suitability regardless of the level of statistical development, and provided an opportunity to identify data shortcomings. Further data collection will increase coverage and extend the data to generate annual and quarterly time series.

8. The main body of *The Guide* comprises two sections. The first section defines the natural resource products and industries. The second section presents and explains eight Template Tables that guide the compilation of national accounts for natural resources and provide analytical tools for understanding the macroeconomic impact of changes in natural resource output and prices.

[3] Accessed at: http://www.imf.org/external/pubs/ft/gfs/manual/comp.htm. The Fund has also a model for Fiscal Analysis of Resource Industries to project the fiscal impact of natural resource projects. See http://www.imf.org/external/np/fad/fari/index.htm.

DEFINITION OF NATURAL RESOURCES AND NATURAL RESOURCE PRODUCTS AND INDUSTRIES

9. The *2008 SNA* (paragraph 10.164) defines natural resources as nonproduced naturally occurring assets, where nonproduced means that the assets are not created by an economic production process. The *2008 SNA* recognizes three types of nonproduced nonfinancial assets: natural resources; contracts, leases and licenses; and purchased goodwill and marketing assets. Natural resources can be divided into: (a) renewable resources, such as uncultivated forests and fish stocks; (b) land; and (c) non-renewable resources, which consist mainly of deposits of minerals that have an economic value.

10. *The Guide* focuses on nonrenewable natural resources. *The Guide* uses the concepts recommended in the *2008 SNA* and is consistent with the *GFS Template*. Environmental economic accounts for natural resources are not covered. However, the Template Tables could also be applied to some renewable natural resources.

A. Natural Resource Products

11. Natural resource products may be extracted and sold with minor processing; alternatively, they may undergo more extensive, secondary, or downstream processing. In *The Guide*, manufactured products that have undergone secondary processing (for example metal ingots) are generally not considered to be natural resource or extractive industry products. However, given the integration of production processes, it is not always straightforward to draw the line between extractive and manufactured products made from natural resource inputs. Nevertheless, the distinction is important. For example, to analyze the external current account of a country exporting natural resources, exports should include extracted and processed natural resources such as crude oil and diesel. On the other hand, to analyze the contribution of the extractive industries to GDP, refined petroleum products should be included in manufacturing industries rather than extractive industries.

12. A list of the relevant natural resource products for *The Guide* is in Box 1. The products are shown at the four-digit level of the Central Product Classification Version 2.1 (CPC 2.1).[4] Although this list provides a standard definition of the natural resource products, products that have undergone secondary processing may also be included if the available data at the enterprise level combine the extraction and secondary processing activities. In addition, natural resources subject to secondary processing before export should usually be taken into account when analyzing exports of natural resource products.

13. Fixed capital assets and services produced by the natural resource industries are considered in compiling national accounts. These are shown in Box 2, and include structures used

[4] CPC version 2.1 was released in August 2015 and posted at: http://unstats.un.org/unsd/cr/registry/cpc-21.asp. The natural resource products are identified in the *GFS Template*.

for exploration or extraction, such as wells and mine shafts, or for transport via pipeline. Several activities which contribute to mineral exploration are included in product class 8621, *Support services for mining*. To compile an estimate of intellectual property products that includes mineral exploration, as recommended in *2008 SNA* paragraph 10.98, mineral exploration products must be separately identified. This can be accomplished by creating a more detailed level of aggregation within the CPC 2.1 subclass codes of class 8621 or by classifying all mineral exploration activities to CPC 2.1 subclass 83413, *Mineral exploration*.

14. Natural resource projects have four phases: exploration, development, extraction, and environmental remediation. Most expenses during the exploration phase, including licensing and acquisition costs, surveys and appraisals, and drilling and test bores, are included in the fixed capital formation as intellectual property products (*2008 SNA*, paragraph 10.106). Fixed assets such as oil wells or mine shafts that are produced in the development phase are intended for direct use in resource extraction and should be classified as structures (Box 2).

15. In some cases, CPC 2.1 groups a natural resource product together with one or more nonnatural resource products, even at the subclass (5-digit) level. Some examples of this are found in product classes 1720 to 4143 of Box 1. Also, in Box 2, liquefaction of natural gas for transport purposes when done away from the well site is part of CPC 2.1 class 6799, *Other supporting transport services*. To distinguish natural resource products, country-specific codes that are suitable for a resource-intensive economy can be created by adding extra digits to the CPC 2.1 subclass code.

Box 1. Natural Resource Products	
CPC 2.1 Class	**Description**
	Ores and Minerals
1101	Coal, not agglomerated
1103	Lignite, not agglomerated
1104	Lignite, agglomerated
1105	Peat
1201	Petroleum oils and oils obtained from bituminous minerals, crude
1202	Natural gas, liquefied or in the gaseous state
1203	Bituminous or oil shale and tar sands
1300	Uranium and thorium ores and concentrates
1410	Iron ores and concentrates, other than roasted iron pyrites
1421	Copper, ores, and concentrates
1422	Nickel ores and concentrates
1423	Aluminum ores and concentrates
1424	Precious metal ores and concentrates
1429	Other nonferrous metal ores and concentrates (other than uranium or thorium ores and concentrates)
1511	Slate
1512	Marble and other calcareous monumental or building stone
1513	Granite, sandstone, and other monumental or building stone
1520	Gypsum, anhydrite, limestone flux, limestone, and other calcareous stone, of a kind used for the manufacture of lime or cement
1531	Natural sands
1532	Pebbles, gravel, broken or crushed stone, macadam; granules, chippings, and powder of stone
1533	Bitumen and asphalt, natural asphaltites, and asphaltic rock
1540	Clays
1611	Natural calcium phosphates, natural aluminum calcium phosphates, and phosphatic chalk
1612	Unroasted iron pyrites
1619	Other chemical minerals
1620	Salt and pure sodium chloride; sea water
1631	Precious stones and semiprecious stones, unworked or simply sawn or roughly shaped
1632	Industrial diamonds, unworked or simply sawn, cleaved or bruted; pumice stone; emery; natural corundum, natural garnet and other natural abrasives
1633	Chalk and dolomite
1639	Other minerals n.e.c.
1720	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons. Include: Coal gas, such as coal seam gas and other extracted gases.
	Metal Products
4131	Silver (including silver plated with gold or platinum), unwrought or in semi-manufactured forms, or in powder form. Include: unwrought or in powder form.

Box 1. Natural Resource Products (Concluded)	
4132	Gold (including gold plated with platinum), unwrought or in semi-manufactured forms, or in powder form. Include: unwrought or in semi-manufactured forms, or in powder form, gold bars.
4133	Platinum, unwrought or in semi-manufactured forms, or in powder form. Include: unwrought or in powder form.
4134	Base metals or silver, clad with gold, not further worked than semi-manufactured. Include: only those products upstream from semi-manufactured.
4135	Base metals clad with silver, and base metals, silver or gold clad with platinum, not further worked than semi-manufactured. Include only those products downstream from semi-manufactured.
4141	Copper unwrought, copper mattes, cement copper. Include: Copper mattes; cement copper, unrefined copper.
4142	Nickel, unwrought; intermediate products of nickel metallurgy. Include: Nickel mattes.
4143	Aluminum unwrought; alumina.
Source: United Nations Central Product Classification 2.1 (http://unstats.un.org/unsd/cr/registry/cpc-21.asp).	

Box 2. Fixed Assets and Services Produced by Natural Resource Industries	
CPC 2.1 Class or Subclass	**Description**
	Fixed Asset and Services Products
54261	General construction services for mines
65131	Transport services via pipeline of petroleum and natural gas
6722	Bulk liquid or gas storage services
6799	Other supporting transport services (liquefaction of natural gas component)
7335	Licensing services for the right to use mineral exploration and evaluation
83413	Mineral exploration and evaluation
8621	Support services to mining
Source: United Nations Central Product Classification 2.1 (http://unstats.un.org/unsd/cr/registry/cpc-21.asp).	

B. Natural Resource Industries

16. The natural resource industries comprise the extractive industries defined in the *ISIC, revision 4 (ISIC 4)*,[5] together with other establishments whose primary activity is producing one of the products shown in Box 1 or Box 2 for the natural resource industry. The extractive industries defined in section B of *ISIC 4* (Mining and Quarrying) are shown in Box 3, together with other natural resource industries. In the cases of the *ISIC 4* industry group 242 and classes 4930 and 5221, only some of the detailed activities in the *ISIC 4* class fall within the natural resource industries.

[5] International Standard Industrial Classification of All Economic Activities, Revision 4 (http://unstats.un.org/unsd/cr/registry/isic-4.asp).

In particular, only the part of industry class 242 involving production of mattes of copper and nickel is included; only the part of class 4930 involving transport of gas, crude petroleum, and other extracted minerals is included; and only the part of class 5221 involving liquefaction of natural gas for transport is included.[6] Countries should choose to include or exclude all of the establishments in a given class depending on whether natural resource products are the predominant output of these establishments.

Box 3. Industries Engaged in Natural Resource Activities

ISIC 4 Section	ISIC 4 Group/Class	Description	Engages in Extractive Activity*	Related to Extractive Activity*
B		**Mining and Quarrying**	Y	
	05	**Mining of coal and lignite**	Y	
	051	Mining of hard coal	Y	
	052	Mining of lignite	Y	
	06	**Extraction of crude petroleum and natural gas**	Y	
	061	Extraction of crude petroleum	Y	
	062	Extraction of natural gas	Y	
	07	**Mining of metal ores**	Y	
	071	Mining of iron ores	Y	
	072	Mining of nonferrous metal ores	Y	
	08	**Other mining and quarrying**	Y	
	810	Quarrying of stone, sand, and clay	Y	
	890	Mining and quarrying n.e.c.	Y	
	09	**Mining support service activities**	N	Y
	091	Support activities for petroleum and natural gas extraction	N	Y
	099	Support activities for other mining and quarrying	N	Y
C		**Manufacturing**		
	24	**Manufacture of basic metals**		
	242	Manufacture of basic precious and other nonferrous metals	N	Y
H		**Transportation and Storage**		
	4930	Transport via pipelines	N	Y
	5221	Service activities incidental to land transportation	N	Y

* Y—Yes N—No.

Source: International Standard Industrial Classification of All Economic Activities, Rev.4 (*ISIC*).

17. In the *2008 SNA*, industries comprised the establishments engaged in the same kind of economic activity. Establishments that engage in more than one type of activity are classified based on their primary activity. If the secondary activity is important, a second establishment may be created for statistical purposes. An establishment may belong to an enterprise that owns other establishments. When an enterprise has extractive industry establishments and establishments engaged in secondary processing of natural resources, such as an integrated oil company that extracts and refines petroleum, data that are reported at the enterprise level may have to be allocated to establishments. If this is impractical, the definition of the natural resource industries

[6] Liquefaction of gas at the well site is included in class 0910.

may be expanded to include the secondary processing activity so that entire enterprises can be included.

C. Processing and Transport of Imported Natural Resources

18. Services for processing and transport of imported natural resources are not included in the definition of an economy's natural resource industries. Processing and transport of natural resources extracted in an economy have been included in the definition of natural resource industries because of their close links to extractive activities. However, when the natural resources come from other economies, the links to foreign extractive activities do not justify including the processing and transport in the economy's natural resource industries. The processing and transport services that facilitate sale of imported natural resources can therefore be excluded from the definition of an economy's natural resource industries in many cases. For example, a natural gas pipeline that transports imported gas used for final consumption would not be treated as part of that economy's natural resource industries.

19. The purpose of analysis may sometimes warrant inclusion of services to process or transport foreign-origin natural resources in an economy's natural resource industries. For example, if a provider of the transport services receives an economic ownership interest in the natural resource, the economic role resembles that of a partner in the natural resources extraction. This sort of arrangement might occur in the case of a pipeline that transports crude oil from another economy across the economic territory for sale to third parties. A criterion of whether to include an oil pipeline in the natural resource industries may be whether income from the oil is shared between the nonresident extractor and the resident owner of the pipeline. For practical reasons, it may not always be possible to exclude services for processing and transport of foreign-origin natural resources. For example, the data may not support a distinction between processing and transport of local-origin natural resources.

TEMPLATE TABLES FOR NATURAL RESOURCES IN THE NATIONAL ACCOUNTS

A. General Considerations

20. The Template Tables (Appendix I) are designed to be consistent with the conceptual framework of the *2008 SNA*. This framework treats the payments received by owners of natural resources for providing the right to extract those resources as rent. Treating these payments as rent makes them distributions of income, not purchases of services or taxes (in the case of payments to the government that owns the resources). Payments for the use of produced assets, which include "rentals," are classified as purchases of services, and a deduction for consumption of fixed capital is made when calculating the net income of the asset owner. The *2008 SNA* also includes a deduction for depletion in the other changes in the volume of assets account. An alternative treatment of depletion of natural resource reserves as a subtraction from income may be presented in an environmental satellite account, as discussed in the *SEEA-CF*.

21. In the SNA framework, taxes on products levied on the output of an industry are viewed as part of the price paid by the purchaser. This makes the treatment of taxes on products produced by natural resource industries more complicated here than in the *GFS Template*. In the *GFS Template*, those taxes are included in government revenues from natural resources under the headings of general taxes on goods and services (GFS code 1141), excises (GFS code 1142) or taxes on exports (GFS code 1152).

22. The Template Tables are general enough to allow any relevant transaction to be included. Countries will often not complete a Template Table in its entirety. In many economies, only a subset of the items shown will be relevant. Where data are not available, the notation NA (Not Available) should be used. Template Tables 1–5 provide a time series describing the natural resource industries based on detailed data such as supply-and-use tables, usually available annually. These data may be available with a long delay and require substantial compilation effort. Template Tables 6–8 meet the needs of contemporary economic policy analysis based on quarterly GDP estimates and other high-frequency data.

23. Compilation of the Template Tables is likely to require coordination among data providers as complete data are unlikely to be available from a single source. Source data may be obtained from multiple data providers; for example, a central bank will provide exports and imports of goods and services as part of the balance of payments, while value added is likely to be compiled by the national statistical office. Modeled estimates may have to be compiled for transactions where direct observation is impractical, such as artisanal mining.

24. If an enterprise has establishments in multiple industries, the data on the income of the enterprise may be impossible[7] to allocate to individual establishments as items such as interest and dividends are not attached to a particular location. This is a problem because, for purposes of analyzing production of natural resource products, the output of each establishment should be assigned to the appropriate industry. It will likely be necessary to include all the establishments of the enterprise, even those that do not produce natural resource products, when analyzing income from natural resources. Income flows are important to track, but doing so may require the acceptance of a broader definition of the natural resource industries to cover entire enterprises in cases where the enterprise's other activities, such as secondary processing, are combined with its natural resource activity. The template for tracing the flows of the income generated by natural resources therefore covers the entire enterprise if the main activities of the enterprise fall within the natural resource industries. For example, an integrated oil company that extracts (primary production) and refines (secondary production) petroleum would be included.

B. Template on the Proportion of Natural Resource Industries to GDP

25. Template Table 1 shows output, value added, taxes on products, and subsidies on products, both for the natural resource industries and for the economy as a whole. The

[7] Countries are encouraged to complete the Template Tables using the best available implementation of the establishment/enterprise in the data sources underpinning their economic statistics. A similar principle applies when distinguishing between industry and product.

standard concept for the output of an industry is the sum of the output of every establishment in the industry. However, consolidated industry output, which excludes output used by other establishments in the same industry, is an alternative concept that is better-suited for analyzing industry proportions of GDP. For example, the output of the mining support services industry is excluded from the consolidated output of natural resource industries as a group because this output is consumed by mining industries. Consolidated output for the economy as a whole equals GDP less net taxes on products plus imports. Estimation of annual supply-and-use tables is encouraged, and these tables allow consolidated (or "unconsolidated") measures of the output of each natural resource industry, and of all natural resource industries as a group, to be compiled. Although the consolidated measure of output is preferred for Template Table 1, the standard, unconsolidated output measure is acceptable if estimation of consolidated output is unfeasible.

26. Taxes on products levied on the output of the natural resource industries may represent a significant source of government revenue. These taxes are based on the quantity or value of the natural resource products produced or sold, and consist of: nondeductible VAT, if any (GFS code 1141 in the IMF's *Government Finance Statistics Manual 2014*); excises (GFS code 1142); profits of fiscal monopolies (GFS code 1143); taxes on the use of goods, including pollution taxes (GFS code 1145); other taxes on goods and services (GFS code 1146), if calculated based on production or sales; and taxes on exports (GFS code 1152). In national accounts, taxes on products are considered to be paid by the buyer of the products, not the seller. Yet, regardless of who is viewed as paying them, the taxes on products sold by the natural resource industries are part of government revenues from natural resources, and are included in this Template and in the *GFS Template*.

27. Subsidies on products based on natural resources, such as fuel, may allow households to pay lower prices on these products. Such subsidies are typically paid to a downstream processing industry (such as petroleum refining) which, under normal circumstances, would not be included in natural resource industries. However, if the subsidies are substantial, a broader definition of the boundary of the natural resource industries that allows the subsidies to be shown in Template Table 1 may be best suited to the circumstance of the economy.

28. The proportion of value added at basic prices[8] of each industry is the standard way to analyze the relative significance of natural resource industries. Nevertheless, national accounts aggregates are frequently shown as a proportion of GDP (which is measured at purchasers' prices) rather than as a proportion of the total value added of all industries (which is measured at basic prices). Taxes on products normally exceed subsidies on products, so GDP is normally larger than the value added of all industries. Taxes less subsidies on products must be added to the value added of all industries to obtain GDP.

29. Value added by industry can be measured at basic prices or producers' prices. The difference is that producers' prices include taxes on products (other than value added tax) and

[8] Basic prices exclude taxes on products and includes subsidies on products.

deduct subsidies on products. Value added at basic prices is shown in Section B of Template Table 1, while value added at producers' prices is shown in section E.

30. Template Table 1 shows the importance of the natural resource industries in GDP as measured by ratios of value added at producers' prices to GDP. The residual that is not assigned to any industry only comprises VAT if producers' prices are used. For purposes of finding shares of GDP, the similarity between producers' prices and the purchasers' prices used in the expenditure approach to GDP makes producers' prices conceptually appealing. Note, however, that the significance of the natural resource industries can also be measured using value added at basic prices. For example, the basic price approach is advantageous if an industry receives large subsidies on products, especially if value added is negative when subsidies on products are not included. While a negative number is meaningful—GDP would have been larger had the inputs used by the subsidized industry been deployed elsewhere—the price including the subsidies may give a more useful measure of the industry's significance to the economy.

31. Economies where natural resources are extracted may also import natural resources for processing or domestic uses. Establishments included in natural resource industries that process or service natural resources extracted by resident establishments may also process or service imported natural resources. For the purposes of measuring the significance of an economy's natural resource industries, it is appropriate to exclude the value added associated with processing or servicing foreign-origin natural resources. If the value added from processing and servicing foreign-origin natural resources cannot be estimated directly from the available source data, ratios based on relevant flows should be applied to allocate output and intermediate consumption so that only the activity relevant to natural resources extracted by resident establishments is recorded in Template Table 1.

32. Some of the output of the natural resource industries, particularly support services for the mining industry, is used for fixed capital formation. For example, drilling for oil and geophysical or seismic surveys are typically done by contractors included within *Mining support service activities* (ISIC 4 Group 09). However, imported goods and services are also used for fixed capital formation. Aggregate amounts of fixed capital formation are important indicators, and are reported in Template Table 2, as discussed below.

C. Distribution of the Income Generated by the Natural Resource Industries

33. Indicators of distribution of income generated by the natural resource industries are presented in Template Table 2. Data on uses of income must be collected at the enterprise level rather than at the establishment level, so all of the income from domestic operations of resident enterprises that engage in a natural resource activity is included. An explanatory note on the reason for the discrepancy between the value added of the establishments in Template Table 1 and the value added data of the enterprises in Template Table 2 may accompany Template Table 2 if necessary. It may be possible to separately identify the value added of the establishments producing natural resource products, which would allow this discrepancy to be quantified.

34. The main headings of Template Table 2 are intended for all compilers of natural resource statistics, while the rows showing the composition of the main headings are optional. The main headings are: output, intermediate consumption, value added, compensation of employees, other taxes less subsidies on production, gross operating surplus, property income, current transfers, gross saving, gross capital formation, capital transfers, acquisitions less disposals of nonproduced nonfinancial assets, and net lending (+) / net borrowing (-). The rows showing the detailed composition of each of the main headings are provided both to serve as a reference on the items that should be included in at least some countries and to enable countries to provide as much detail as possible on the distribution of the income generated by their natural resource enterprises. These rows need not be filled out if source data are not readily available or the amounts involved are small. However, when completing the table, rent paid to owners of natural resources should be reported.

35. The top row of Template Table 2 shows the revenue received from sales of output plus the value of output used for capital formation. Taxes on products that are paid by buyers of the goods and services produced by natural resource enterprises are excluded as output is valued using basic prices. Enterprises that produce natural resource products may have additional establishments that produce other kinds of goods and services as secondary or downstream outputs. The other products are included in the income from production of the natural resource enterprises.

36. The part of the income from output that is used to purchase products used for intermediate consumption is shown in row 4. Taxes on products, including import duties on items directly imported by the enterprise, are included in the prices paid for intermediate inputs. Fees paid to government are treated as purchases of intermediate inputs if they entitle the payer to receive a service or cover the costs of government services used by the industry.

37. The income arising from the value added equals the difference between output and intermediate consumption. A portion of this income is used for compensation of employees, and another part is used for payment of other taxes less subsidies on production. Examples of other taxes on production include property taxes, business and professional licenses, licenses required for exploration or extraction, and pollution taxes.

38. Gross operating surplus is the amount of value added that remains after expenses for compensation of employees and other taxes less subsidies on production. Gross operating surplus plus gross receipts of property income is the amount that is available for distribution as property income to investors and to owners of natural resources. The payments to investors consist of dividends and interest. If the government has a stake in enterprises engaged in natural resource activities within the country's economic territory, including public corporations, the dividends payable to the government should be shown as an "of which" item.

39. Foreign direct investment often plays an important role in the natural resource industries. In the case of foreign direct investment, the proportion of retained earnings of local corporations that are owned by nonresident direct investors such as multinational corporations are treated as if they had been distributed and then reinvested by the nonresident owner. They are therefore shown below dividends in the table as an imputed distribution of property income.

40. Payments of property income to the owners of natural resources are rent. All users of the template should report rent payments of natural resource enterprises. Rent includes royalties, bonuses, and license charges payable by natural resource enterprises. If the government is not the only recipient of royalty and license payments, the rent received by government should be shown separately in the table as an "of which" item. A measure of the net rent that deducts a depletion expense associated with the extracted natural resources owned by the recipient of the rent may also be calculated, which goes beyond the *2008 SNA* but is in line with the *SEEA-CF*.

41. The government may also receive rent payments from foreign-owned or private natural resource enterprises as production entitlements or production sharing. These enterprises also may meet their production sharing obligations by making payments or transferring output to a public corporation. In this case, the value of the payments and output that the public corporation is entitled to receive should be rerouted through the general government sector. Rerouting means that government is recorded as receiving rent equal to the value of the production transferred to the public corporation, and paying a current transfer to the public corporation.

42. Current transfers, which include taxes on income or capital gains, are another use of the gross operating surplus of natural resource enterprises. Fines, forfeitures, and penalties paid by natural resource enterprises are included in the line for "other current transfers." If public corporations are entitled to production sharing, the amounts received by the public corporation are shown as current transfers made by the government from the rent that it has received in connection with production sharing. A transfer received by an enterprise would be recorded as a negative number in Template Table 2 because the table shows net payments *from* enterprises.

43. Gross saving is the amount that remains after property income is distributed and income taxes and other current transfers are paid. For natural resource enterprises, gross saving is, conceptually, equal to retained corporate earnings after tax but before charges for depletion. Consumption of fixed capital, which is a charge for depreciation of fixed assets as calculated in national accounts, can be subtracted from gross saving to obtain net saving, and also subtracted from gross fixed capital formation to obtain net fixed capital formation.

44. Gross saving that is not used for capital transfers may be invested in produced assets, in nonproduced nonfinancial assets, or in financial assets. Net acquisitions of produced assets used in production are known as "gross fixed capital formation," where "gross," in this case, means before deduction of consumption of fixed capital. Changes in inventories include natural resource products produced but not yet sold, and work in progress. To measure capital formation on an accrual basis, work-in-progress assets should be recorded for fixed assets that are not completed in one accounting period. For example, some kinds of fixed capital assets used by extractive industries, such as major offshore oil and gas platforms and liquefied natural gas (LNG) plants, take more than one year to construct. To measure capital formation on an accrual basis, work-in-progress assets should be recorded for fixed assets that are not completed at the end of one accounting period.

45. Nonproduced nonfinancial assets include long-lived licenses to extract mineral reserves (*2008 SNA*, paragraph 17.316). If payments for long-lived licenses are treated as

acquisitions of nonproduced nonfinancial assets rather than as rent, investment in such assets should be shown as one of the uses of gross saving, and excluded from rent.

46. Net acquisition of financial assets less net incurrence of financial liabilities equals net lending (+)/net borrowing (-). Net lending (+)/net borrowing (-) is estimated as the residual that remains after accounting for the uses of gross saving for gross capital formation, net payments of capital transfers, and net acquisitions of nonproduced nonfinancial assets.

47. Government revenue from taxes, rent and fees for services paid by the natural resource enterprises or buyers of their output is shown in the addendum to Template Table 2. The total of the fees for services, other taxes on production, dividends, rent, and current transfers shown above is reported in the addendum in row 37.

48. The next addendum section shows exports of natural resource products. Locally produced natural resources subject to secondary processing before being exported should also be included, and their inclusion should be noted. Total exports of all goods and services are shown below exports of natural resource products for comparison purposes.

49. The addendum shows depletion of natural resource reserves. In the *2008 SNA,* reductions in the value of known reserves resulting from depletion as a result of extracting assets are recorded in the other changes in the volume of assets' account as opposed to sales of fixed assets. This means in the *2008 SNA* depletion is treated differently from depreciation for fixed capital when calculating net domestic product and net disposable income. In contrast, the *SEEA-CF* introduces supplementary measures of depletion, by recording depletion as a cost against the associated income. *The Guide* shows depletion in the addendum to allow calculation of alternative income measures as proposed by *SEEA-CF*, and may also be reported by the natural resource enterprises. Depletion-adjusted value added as defined by *SEEA-CF* can also be derived using *2008 SNA* data reported in Template Table 1. For comparison purposes, the last two lines of the addendum show the total value of reserves, and the total value of all assets of natural resource enterprises.[9]

D. Labor in the Natural Resource Industries

50. To analyze the role of labor Template Table 3 shows employment and compensation of employees in the natural resource industries. Comparable figures for the whole economy are also shown along with the gender composition of the labor force. These data can be used to analyze questions such as the under-representation of women in high-paying industries. Hours worked is the preferred measure of labor input to compare returns to labor and productivity over time, across industries, and among comparable countries. Opting for hours worked as the labor input measure instead of number of employees improves comparability because average hours worked can vary over time, across industries, and countries. However, comparability may still be mitigated by

[9] The valuation of nonproduced nonfinancial assets is discussed in *2008 SNA* Chapter 20. A discussion on reserve valuation is provided in *Guide on Resource Revenue Transparency,* https://www.imf.org/external/np/pp/2007/eng/101907g.pdf.

differences in occupational mix and human capital reflecting education, training, or experience. Average hours worked may be available from a household or employer survey. Where this information is not available, full time equivalent employment or number of employees may be used, keeping in mind that multiple job holders or part-time workers may not be recorded consistently by these approaches.[10]

51. Labor productivity growth over time is measured by the difference between the growth of value added in volume terms and the growth of hours worked. Thus, the data on hours worked in Template Table 3 can be combined with the data on value added at constant prices in Template Table 4 to measure the growth of labor productivity in the natural resource industries. Cross-section comparisons of value added per hour in different industries within an economy should generally be based on value added at current prices, however.

E. Contributions of the Natural Resource Industries to the Volume and Deflator Change in GDP

52. The contribution of natural resource industries to the volume change in GDP is an important measure. The general approach to calculating contributions to growth of these (and other) industries is shown in Template Table 4. The difference in level between the current year and the preceding year in the value added shows the absolute change in volume expressed in base period prices. Expressing the absolute change as a proportion of GDP in the previous year describes the industry's direct contribution to the growth in GDP. This value could also be calculated by multiplying the industry's share of GDP in the previous period by the growth rate of its industry value added at constant prices.

53. Some countries calculate volume measures in a constant price framework, with updates of the base year at intervals of more than a year. In the constant price volume, both the current year and the preceding year are measured using the prices of a third base year. The calculation of contributions to volume change in the constant price framework can be derived from Template Table 4. The difference in value added between the current year and the preceding year (measured at constant prices of the base year) is divided by GDP of the preceding year (measured at prices of the base year) and then expressed as a percentage to calculate the contribution to volume change from the natural resource industry.

54. If the contributions to change in GDP are calculated from value added at producers' prices (as in Template Table 1), the contribution of unallocated taxes on products in Template Table 4 will consist of VAT, while if basic prices are used, all taxes less subsidies on products will be shown. These definitions ensure that the contributions to change shown in the final column add up to the aggregate change in GDP. Producers' prices have the advantage of corresponding more closely to the prices used to calculate GDP based on final expenditures, while basic prices have

[10] For example, consider one person working two jobs - one in the natural resource industry, and the second in the education industry. This individual will be recorded in the labor force survey as one employed person (i.e., employment) classified to the predominant industry. The employer survey will record two jobs (i.e., employees).

the advantage of being the standard way that value added is measured in production. Using basic prices may also prevent value added from being negative in cases of industries producing heavily subsidized products.

55. Estimates of taxes less subsidies on products in volume (constant price) terms should always be calculated using volume extrapolation or by applying the base year tax rate to the volume of the taxed item in the current period. The volume of the tax or subsidy on a product must change in the same proportion as the volume of the product itself (*2008 SNA*, paragraphs 14.148-152). The volume movement for the underlying product must first be determined by either price deflation or quantity extrapolation applied to output, imports, or consumption, and then the movement of the tax or subsidy on the product is calculated from the product's volume change. For example, an excise tax levied on production of natural gas should move in proportion to the volume of natural gas output. Deflating taxes or subsidies on products directly by a price index such as a CPI or PPI should be avoided.

56. Some countries use a chained index framework in which the prices used to calculate the volume change are updated annually. With annual chaining, the prices of the preceding year are used to measure the volume of GDP in the current year. In this case, the value added of the natural resource industries in the preceding year is subtracted from value added in the current year measured at the prices of the preceding year. The difference in levels with prices held constant is then divided by the GDP of the preceding year to obtain the contribution to the volume change in GDP.

57. Contributions of prices of the outputs and intermediate inputs to the change in the GDP deflator may be calculated using an analogous approach to the one used for volume change contributions, as shown in Template Table 5. However, the interpretation of such price change contributions is not straightforward because they show only the direct effects. Other things being equal, a change in the price of the output that is sold by the natural resource industries to a resident establishment in another industry will have offsetting effects on the two industries, but only the direct effect on the seller will be reflected in the price change contribution.

58. The deflators for outputs and intermediate consumption of natural resource industries should use appropriate individual prices for each product. The assumption that input and output prices change at the same rate can lead to distorted results. This is particularly relevant for natural resource industries, where prices often change rapidly.[11] For example, a sharp fall in the price of oil will not necessarily be paralleled by a sharp fall in the prices of inputs used by the oil industry.

[11] This also occurs in other industries, such as processors of agricultural commodities. IMF Staff Discussion Note (SDN/17/02) "Measure up: A Better Way to Calculate GDP" by Thomas Alexander, Claudia Dziobek, Marco Marini, Eric Metreau, and Michael Stanger elaborates this point, http://www.imf.org/~/media/files/publications/sdn/2017/sdn1702.ashx.

F. Terms of Trade Effects

59. Export and import prices have direct effects on GDP in current prices and on real income. An improvement in the terms of trade, an index of the ratio of export prices to import prices, raises export revenues relative to import costs and makes it possible to increase consumption while maintaining the same trade balance in Template Table 6.

60. The high price volatility that is characteristic of natural resources means that terms of trade effects are particularly important for economies with large exports of natural resource products.[12] The terms of trade index provides a single summary statistic for the effects of changes in prices of internationally traded goods and services. In addition, the influence of natural resource products on the terms of trade can be shown by calculating export and import price indexes with and without natural resource products. Because changes in petroleum prices tend to be passed through to refined petroleum product prices, exports and imports of refined petroleum products should be included in the sensitivity analysis along with the natural resource products defined in Box 1. These indexes are shown in Template Table 6.

61. Implicit deflators for the expenditure components of GDP can be used to measure the effects of international trade prices on real income. The combined consumption and capital formation components of the expenditure approach make up gross domestic final expenditure. Deflating GDP by the implicit deflator for gross domestic final expenditure yields real gross domestic income. Real gross domestic income is a measure of the purchasing power of the income generated by domestic production.

62. The difference in the growth rates of real gross domestic income and GDP volume is measured by the change in the ratio of the implicit deflator for GDP to the implicit deflator for gross domestic final expenditure.[13] This ratio is also known as the trading gains index. The effect of natural resource prices on the trading gains index can be isolated by calculating a version of the GDP deflator that excludes exports and imports of natural resources. Differences in growth rates between real gross domestic income and GDP in volume terms show the effect of changes of international trade prices on real income.

G. Quarterly Indicators for GDP and Exports of Goods and Services

63. Quarterly national accounts provide timely information to assist contemporary economic policy, but are almost always compiled at a less detailed level than the annual accounts.[14] The quarterly Template Tables 7 and 8 have less detail than the annual template tables (1–5) because source data are unlikely to be available on a quarterly basis at the same detailed level

[12] Changes in terms of trade are also often important for exporters of agricultural commodities.

[13] Gross domestic final expenditure is defined as the sum of final consumption and capital formation (*2008 SNA* paragraph 15.185).

[14] See Quarterly National Accounts Manual - Concepts, Data Sources, and Compilation http://www.imf.org/external/pubs/ft/qna/2000/Textbook/, paragraph 2.30.

needed for the annual template tables. For example, value added for the *Transport via pipeline* industry is unlikely to be available with full coverage on a quarterly basis (Box 3). Template Tables 7 and 8 are therefore designed to approximate the natural resource industries by using the mining industry (ISIC Section B). Template Tables 7 and 9 also make use of high frequency data on exports of goods which are typically provided via administrative records of customs departments.

64. Template Table 7 describes quarterly value added for mining and all other industries, taxes less subsidies on products, and GDP. It is expected that the share of GDP in current prices represented by the natural resource industries will vary over the short term in accordance with movements in commodity prices. The table disaggregates changes in current prices into volume and price changes.

65. Template Table 8 decomposes exports of goods and services into natural resources products and other products. Similar to Template Table 7, movements in current price data can be decomposed into changes in price and changes in volume. The Template Table is presented in terms of quarterly data as exports of goods and services is a key component of quarterly GDP. Subject to availability of appropriate source data (e.g., price indexes and customs records), it may be possible to present Template Table 8 as a monthly time series.

Appendix I. Template Tables for National Accounts on Natural Resources

Template Table 1. Proportion of Natural Resource Industries to GDP							
Row	**Description**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
A.	**Output[a] (domestic currency)**						
1	Mining of coal and lignite (ISIC Division 05)						
2	Extraction of crude petroleum and natural gas (ISIC Division 06)						
3	Mining of metal ores (ISIC Division 07)						
4	Other mining and quarrying (ISIC Division 08)						
5	Mining support service activities (ISIC Division 09)						
6	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
7	Transport via pipeline (ISIC Class 4930[b])						
8	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
9	**Natural Resource Industries [sum rows 1 to 8]**						
10	**All Industries in the Economy**						
B.	**Value Added (domestic currency)**						
11	Mining of coal and lignite (ISIC Division 05)						
12	Extraction of crude petroleum and natural gas (ISIC Division 06)						
13	Mining of metal ores (ISIC Division 07)						
14	Other mining and quarrying (ISIC Division 08)						
15	Mining support service activities (ISIC Division 09)						
16	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
17	Transport via pipeline (ISIC Class 4930[b])						
18	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
19	**Natural Resource Industries [sum rows 11 to 18]**						
20	**All Industries in the Economy**						
C.	**Taxes on Products[d] (domestic currency)**						
21	Mining of coal and lignite (ISIC Division 05)						
22	Extraction of crude petroleum and natural gas (ISIC Division 06)						
23	Mining of metal ores (ISIC Division 07)						
24	Other mining and quarrying (ISIC Division 08)						
25	Mining support service activities (ISIC Division 09)						
26	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
27	Transport via pipeline (ISIC Class 4930[b])						

Template Table 1. Proportion of Natural Resource Industries to GDP (Continued)							
28	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
29	**Natural Resource Industries [sum rows 21 to 28]**						
30	**All Industries in the Economy**						
D.	**Subsidies on Products (domestic currency)**						
31	Mining of coal and lignite (ISIC Division 05)						
32	Extraction of crude petroleum and natural gas (ISIC Division 06)						
33	Mining of metal ores (ISIC Division 07)						
34	Other mining and quarrying (ISIC Division 08)						
35	Mining support service activities (ISIC Division 09)						
36	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
37	Transport via pipeline (ISIC Class 4930[b])						
38	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
39	**Natural Resource Industries [sum rows 31 to 38]**						
40	**All Industries in the Economy**						
E.	**Value Added + Taxes less Subsidies on Products [B + C – D] (domestic currency)**						
41	Mining of coal and lignite (ISIC Division 05)						
42	Extraction of crude petroleum and natural gas (ISIC Division 06)						
43	Mining of metal ores (ISIC Division 07)						
44	Other mining and quarrying (ISIC Division 08)						
45	Mining support service activities (ISIC Division 09)						
46	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
47	Transport via pipeline (ISIC Class 4930[b])						
48	Service activities incidental to land transportation[c] (ISIC Class 5221[b])						
49	**Natural Resource Industries**						
50	**All Industries in the Economy**[e, f]						
F.	**Share of GDP [E / (50)] (percent)**						
51	Mining of coal and lignite (ISIC Division 05)						
52	Extraction of crude petroleum and natural gas (ISIC Division 06)						
53	Mining of metal ores (ISIC Division 07)						
54	Other mining and quarrying (ISIC Division 08)						
55	Mining support service activities (ISIC Division 09)						
56	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420[b])						
57	Transport via pipeline (ISIC Class 4930[b])						

Template Table 1. Proportion of Natural Resource Industries to GDP (Concluded)							
58	Service activities incidental to land transportation[b] (ISIC Class 5221[b])						
59	**Natural Resource Industries**						
60	**All Industries in the Economy**	**100**	**100**	**100**	**100**	**100**	**100**

a. A footnote should be included to indicate whether this is unconsolidated or consolidated**.**

b. Manufacturing, transport, and other services of natural resources imported from another economy are excluded.

c. This class includes liquefaction of gas for transportation purposes.

d. Taxes on products of the natural resource industries omit VAT that is deductible to the purchaser. Total payments of VAT are included in the total for all resident units of taxes on products.

e. Total for all resident units equals GDP.

f. This item includes VAT which is deductible to purchaser.

Template Table 2. Distribution of the Income of Natural Resource Enterprises (Domestic currency)			
Row	**Description**	**Year 1**	**Year 2**
1	**Output of the Natural Resource Industries at Basic Prices, Comprising:**		
2	Natural resource products		
3	Other products		
4	**Intermediate Consumption of the Natural Resource Industry at Purchasers' Prices, Comprising:**		
5	From domestic units, excluding government		
6	Fees and other purchases of government services		
7	Imported		
8	**Value Added at Basic Prices [(1) – (4)]**		
9	**Compensation of Employees**		
10	Payable to residents		
11	Payable to nonresidents		
12	**Other Taxes Less Subsidies on Production**		
13	Other taxes on production		
14	Other subsidies on production		
15	**Gross Operating Surplus**		
16	**Property Income, Payments net of Receipts**[a]		
17	Interest		
18	Dividends		
19	Of which, to government		
20	Reinvested earnings on foreign direct investment		
21	Rent (royalties[b], bonuses, licenses, and production entitlements)		
22	Of which, to government		
23	**Current Transfers, Payments net of Receipts**[a]		
24	Taxes on income and other current taxes		
25	Net transfers from state owned enterprises		
26	Other current transfers		
27	**Gross Saving [(15) – (16) – (23)]**		
28	**Gross Capital Formation**		
29	Gross fixed capital formation		
30	Consumption of fixed capital		
31	Net fixed capital formation		
32	Changes in inventories		
33	**Capital Transfers (paid less received)**[a]		
34	**Acquisitions less Disposals of Nonproduced Nonfinancial Assets**		
35	**Net Lending (+) / Net Borrowing (-) [(27) – (28) – (33) – (34)]**		
Addendum			
36	Total government revenue related to natural resources[c]		

Template Table 2. Distribution of the Income of Natural Resource Enterprises (Domestic currency) (Concluded)

37	Total government revenue from all sources		
38	Exports of natural resource products[d]		
39	Exports of goods and services		
40	Depletion of reserves		
41	Depletion-adjusted net value added [Template Table 1, (20) – (30) – (40)]		
42	Value of reserves		
43	Total assets		

a. An industry allocation for many of the items comprising property income and transfers is not readily available. Some items (e.g., dividends) can be estimated separately from enterprise data, while modelled estimates are required for others (e.g., reinvested earnings).
b. "Royalties" for nonproduced assets refers to *2008 SNA* "rent".
c. This value is obtained directly from the *GFS Template*.
d. Re-exports are excluded and downstream products made from local natural resources should be noted.

Template Table 3. Labor in the Natural Resource Industries

Row	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
A.	**Compensation of Employees[a] (domestic currency)**						
1	Natural resource industries						
2	All other industries						
3	All industries						
B.	**Hours Worked (hours)[b] / Employees (persons) / Employment (jobs)**						
4	Natural resource industries						
	of which female						
5	All other industries						
	of which female						
6	All industries						
	of which female						
C.	**Compensation of Employees per unit of Labor [A / B] (domestic currency)**						
7	Natural resource industries						
8	All other industries						
9	All industries						
D.	**Compensation of Employees as a share of Value Added[c] [100 × A / Value Added] (percent)**						
10	Natural resource industries						
11	All other industries						
12	All industries						

a. Compensation of employees should relate to either: (i) the set of establishments used to derive value added (Template Table 1); (ii) or enterprises (Template Table 2, (9)), classified to the natural resource industries. The compiler should select and note the measure which provides the best correspondence with the selected labor measure.

b. While hours worked is preferred, full-time equivalent (FTE) employment or number of employees may be used.

c. Template Table 1 should be used if compensation of employees relates to establishments classified to the natural resource industries. Template Table 2 should be used if compensation of employees relates to enterprises classified to the natural resource industry.

Template Table 4. Contributions of the Natural Resource Industries to Volume Change in GDP							
Row	**Description**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
A.	**Value Added in Base Year Prices[a] (domestic currency)**						
1	Mining of coal and lignite (ISIC Division 05)						
2	Extraction of crude petroleum and natural gas (ISIC Division 06)						
3	Mining of metal ores (ISIC Division 07)						
4	Other mining and quarrying (ISIC Division 08)						
5	Mining support service activities (ISIC Division 09)						
6	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
7	Transport via pipeline (ISIC Class 4930)						
8	Service activities incidental to land transportation (ISIC Class 5221)						
9	**Natural Resource Industries [sum rows 1 to 8]**						
10	**All Other Industries**						
11	**Taxes less Subsidies on Products**						
12	**Gross Domestic Product**						
B.	**Value Added of the Previous Period in Base Year Prices[b] (domestic currency)**						
13	Mining of coal and lignite (ISIC Division 05)						
14	Extraction of crude petroleum and natural gas (ISIC Division 06)						
15	Mining of metal ores (ISIC Division 07)						
16	Other mining and quarrying (ISIC Division 08)						
17	Mining support service activities (ISIC Division 09)						
18	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
19	Transport via pipeline (ISIC Class 4930)						
20	Service activities incidental to land transportation (ISIC Class 5221)						
21	**Natural Resource Industries [sum rows 13 to 20]**						
22	**All Other Industries**						
23	**Taxes less Subsidies on Products**						
24	**Gross Domestic Product**						
C.	**Contribution to Volume Change in GDP [100 × (A – B) / (24)] (percentage points)**						
25	Mining of coal and lignite (ISIC Division 05)						
26	Extraction of crude petroleum and natural gas (ISIC Division 06)						
27	Mining of metal ores (ISIC Division 07)						
28	Other mining and quarrying (ISIC Division 08)						

Template Table 4. Contributions of the Natural Resource Industries to Volume Change in GDP (Concluded)							
29	Mining support service activities (ISIC Division 09)						
30	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
31	Transport via pipeline (ISIC Class 4930)						
32	Service activities incidental to land transportation (ISIC Class 5221)						
33	**Natural Resource Industries [sum rows 25 to 32]**						
34	**All Other Industries**						
35	**Taxes less Subsidies on Products**						
36	**Gross Domestic Product**						

a. If annual chaining is used, value added will be reported in previous year prices.
b. If annual chaining is used, these data will be value added in current prices (lagged by one year).

Template Table 5. Contributions of Prices Paid and Received by the Natural Resource Industries to the Cumulative Change in GDP Implicit Deflator since the Base Year							
Row	**Description**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
A. Value Added in Current Prices (domestic currency)							
1	Mining of coal and lignite (ISIC Division 05) [Template Table 1, (11)]						
2	Extraction of crude petroleum and natural gas (ISIC Division 06) [Template Table 1, (12)]						
3	Mining of metal ores (ISIC Division 07) [Template Table 1, (13)]						
4	Other mining and quarrying (ISIC Division 08) [Template Table 1, (14)]						
5	Mining support service activities (ISIC Division 09) [Template Table 1, (15)]						
6	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420) [Template Table 1, (16)]						
7	Transport via pipeline (ISIC Class 4930) [Template Table 1, (17)]						
8	Service activities incidental to land transportation (ISIC Class 5221) [Template Table 1, (18)]						
9	**Natural Resource Industries [Template Table 1, (19)]**						
10	**All Other Industries [Template Table 1, (20) – (9)]**						
11	**Taxes less Subsidies on Products [Template Table 1, (30) – Template Table 1, (40)]**						
12	**Gross Domestic Product [Template Table 1, (50)]**						
B. Contribution to change in GDP Deflator (percentage points) [100 × (A – Template Table 4, A) / Template Table 4, (12)] (percentage points)							
13	Mining of coal and lignite (ISIC Division 05)						
14	Extraction of crude petroleum and natural gas (ISIC Division 06)						
15	Mining of metal ores (ISIC Division 07)						
16	Other mining and quarrying (ISIC Division 08)						
17	Mining support service activities (ISIC Division 09)						
18	Manufacture of basic precious and other nonferrous metals (ISIC Class 2420)						
19	Transport via pipeline (ISIC Class 4930)						
20	Service activities incidental to land transportation (ISIC Class 5221)						
21	**Natural Resource Industries [sum rows 13 to 20]**						
22	**All Other Industries**						
23	**Taxes less Subsidies on Products**						
24	**Gross Domestic Product**						

Template Table 6. Terms of Trade Index [a]					
Row	**Description**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**
A: Index Numbers					
1	Implicit Deflator – Exports of Goods and Services				
2	Implicit Deflator – Imports of Goods and Services				
3	Terms of Trade Index [100 × (1) / (2)]				
4	Implicit Deflator – Exports of Goods and Services excluding natural resources				
5	Implicit Deflator – Imports of Goods and Services excluding natural resources				
6	Terms of Trade Index – excluding natural resources [100 × (4) / (5)]				
7	Implicit Deflator – GDP				
8	Implicit Deflator - Gross Domestic Final Expenditure				
9	Effect of export and import prices on real gross domestic income[b] [100 × (7) / (8)]				
10	Implicit Deflator - GDP excluding exports and imports of natural resources				
11	Effect of export and import prices on real gross domestic income excluding natural resources [100 × (10) / (8)]				
B: Percentage Change since Preceding Period					
12	Implicit Deflator – Exports of Goods and Services				
13	Implicit Deflator – Imports of Goods and Services				
14	Terms of Trade Index [≈ (12) – (13)]				
15	Implicit Deflator – Exports of Goods and Services excluding natural resources				
16	Implicit Deflator – Imports of Goods and Services excluding natural resources				
17	Terms of Trade Index – excluding natural resources [≈ (15) – (16)]				
18	Implicit Deflator – GDP				
19	Implicit Deflator - Gross Domestic Final Expenditure				
20	Effect of export and import prices on real gross domestic income[b] [≈ (18) – (19)]				
21	Implicit Deflator - GDP excluding exports and imports of natural resources				
22	Effect of export and import prices on real gross domestic income excluding natural resources [≈ (21) – (19)]				

a. The Template Table is presented in terms of quarterly data - however it may be possible to compile a monthly time series. Countries without quarterly estimates are encouraged to compile this table using annual data.
b. Also known as the "trading gains index."

Template Table 7. Quarterly Indicators[a] of the Contributions of the Natural Resource Industries to GDP					
Row	**Description**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**
A.	**GDP × Production in current prices (domestic currency)**				
1	Mining value added (ISIC Section B)				
2	All other industries value added				
3	Taxes less subsidies on products				
4	Gross domestic product [(1) + (2) + (3)]				
B.	**GDP × Production in current prices [100 x A / (4)] (percent)**				
5	Mining value added (ISIC Section B)				
6	All other industries value added				
7	Taxes less subsidies on products				
8	Gross domestic product	100	100	100	100
C.	**GDP × Production in base year prices[b] (domestic currency)**				
9	Mining value added (ISIC Section B)				
10	All other industries value added				
11	Taxes less subsidies on products				
12	Gross domestic product [(9) + (10) + (11)]				
D.	**GDP × Production, corresponding quarter of previous year, in base year prices[b] (domestic currency)**				
13	Mining value added (ISIC Section B)				
14	All other industries value added				
15	Taxes less subsidies on products				
16	Gross domestic product [(13) + (14) + (15)]				
E.	**Contribution to annual volume change in GDP [100 × (C – D) / (16)] (percentage points)**				
17	Mining value added (ISIC Section B)				
18	All other industries value added				
19	Taxes less subsidies on products				
20	Gross domestic product				
F.	**Implicit deflator [100 × A / C]**				
21	Mining value added (ISIC Section B)				
22	All other industries value added				
23	Taxes less subsidies on products				
24	Gross domestic product				

a. Countries without quarterly estimates are encouraged to compile this table using annual data.
b. If annual chaining is used, value added will be reported in previous year prices.

Template Table 8. Quarterly Indicators[a] of the Contributions of Natural Resources to Exports of Goods and Services

Row	Description	Quarter 1	Quarter 2	Quarter 3	Quarter 4
A.	**Exports of Goods and Services in Current Prices (domestic currency)**				
1	Natural resource products				
2	Other products				
3	Exports of goods and services [(1) + (2)]				
B.	**Exports of Goods and Services in Current Prices [100 × A / (3)] (percent)**				
4	Natural resource products				
5	Other products				
6	Exports of goods and services	100	100	100	100
C.	**Exports of Goods and Services in Base Year Prices[b] (domestic currency)**				
7	Natural resource products				
8	Other products				
9	Exports of goods and services [(7) + (8)]				
D.	**Exports of Goods and Services, Corresponding Quarter of Previous Year, in Base Year Prices[b] (domestic currency)**				
10	Natural resource products				
11	Other products				
12	Exports of goods and services [(10) + (11)]				
E.	**Contribution to Annual Volume Change in Exports of Goods and Services [100 × (C – D) / (12)] (percentage points)**				
13	Natural resource products				
14	Other products				
15	Exports of goods and services				
F.	**Implicit Deflator [100 × A / C]**				
16	Natural resource products				
17	Other products				
18	Exports of goods and services				

a. The Template Table is presented in terms of quarterly data - however it may be possible to compile a monthly time series. Countries without quarterly estimates are encouraged to compile this table using annual data.
b. If annual chaining is used, value added will be reported in previous year prices.