

A proposal for adding environmental classes to the
classification systems utilized by the System of National
Accounts

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SECTION 1: THE ISSUE

BACKGROUND

1. Classification systems provide statisticians a way to organize and present data to users in a clear, consistent, and analytically useful manner. The 2008 SNA utilizes 13 classification systems to present information to users. Of the 13 classification systems used, 4 are specific to the SNA with the remaining 9 'inherited' from other statistical frameworks. The 4 classification systems specific to the SNA include the classification of institutional sectors, classification of transactions, classification of other economic flows and classification of stocks.
2. Since the release of the System of National Accounts, 2008 (*2008 SNA*) there has been increased demand for statistics that highlight the interplay between the economy and the environment. The current set of SNA environmental classes included in the 2008 SNA classifications (either germane or inherited) focus on environmental protection, resource management and natural resource assets. While important, the scope of the classifications do not fully address emerging issues related to sustainability, biodiversity management, climate change, renewable energy, waste and recycling activities, environmental, social progress, governance, or environmental degradation.
3. Information related to biodiversity management is becoming increasingly important. Biodiversity management reflects those activities that preserve or restore biological diversity of an area (ecosystems) or species. This would involve the activities of governments, non-profit institutions, and corporations whose primary output are services aimed at the preservation of biodiversity.
4. In order to reduce GHG emissions countries will need to transition away from fossil fuel-based energy production. It is expected that more of the world's energy production will need to come from non-emitting non-renewable and renewable resources such as water, wind geothermal, and solar. There are multiple aspects of renewable non-GHG emitting energy that would need to be captured in macroeconomic statistics including the financing required to fund the transition, the investment in non-emitting energy installations, the stock of these renewable non-emitting energy resources and the winding down of fossil-fuel based energy installations.
5. Waste and the management of waste is of growing importance and has important implications for firms. The current classification systems treat waste from a somewhat narrow perspective. Updates to classification systems are needed to account for all types of waste as well as the uses of waste by firms (i.e. as an input into the production process).
6. With the growing recognition of the effects of climate change, many economies are moving away from the traditional products. Apart from an increase in the production and adoption of environment-friendly or low-footprint products, the environment industry has broadened with the emergence of several new activities. These need to be reflected in the next vintage of classification used to compile and present national accounts.
7. Activities related to conservation of natural resources and ecosystems are not yet identifiable due to lack of distinct codes for such activities. Resource management activities such as the conservation, discovery, development and rationalized exploitation of natural resources, R&D related to natural resources and the supervision and regulation of the related economic activities need to be identified.

8. Themes such as waste management, biodiversity, renewable energy, and natural resource management are being addressed in the update of the ISIC, CPC, and various functional classifications heavily utilized by the SNA. The ISIC revision is the most advanced, followed by the CPC revision. The COFOG revision process is just starting. The SNA and SEEA communities have been heavily involved in these update processes. Give these on-going initiatives this guidance note has been limited to a discussion on possible updates to the 4 classification systems specific to the SNA: namely the institutional sector classification system (S), the classification of transactions (P, NP, D, F), the classification of other flows (K) and the classification of stocks (AN and AF). Moreover, the recommended updates have been further limited to (1) reflect the new and/or refined wellbeing-environment-economic concepts reflected in the various SNA update guidance notes already endorsed by the ISWGNA/AEG and (2) suggested additional classes that could be added to the SNA specific classification systems which have not yet been addressed in the update process.

CLASSIFICATION SYSTEMS GERMANE TO THE SNA

9. The concept of an institutional unit is foundational to the 2008 SNA. The SNA groups institutional units into five distinct institutional sectors – distinguished by their economic objectives, functions, and behaviours. The institutional sector classification system also distinguishes between resident institutional sectors and non-residents¹. Each sector has varying degree of sub-sector detail.

Table 1 - Institutional Sectors

Total Economy (S1)
Non-financial Corporations (S11)
Financial corporations (S12)
General Government (S13)
Households (S14)
Non-profit institutions serving households (S15)
Non-Resident (S2)

10. A second classification system germane to the SNA pertains to the classification of transactions. Within the 2008 SNA a transaction is defined as “*an economic flow that is an interaction between institutional units by mutual agreement or an action within an institutional unit that it is analytically useful to treat like a transaction, often because the unit is operating in two different capacities*” (2008 SNA – Glossary). This classification system distinguishes between four categories of transactions – transactions in products, transactions in non-produced assets, distributive transactions and transactions in financial assets and liabilities.

Table 2 – Classification of Transactions

Transactions in Products (P)
Transactions in non-produced assets (NP)
Distributive Transaction (D)
Transactions in financial assets and liabilities (F)

¹ Note that even though non-residents are included in the institutional sector classification it is not considered a sector since it encompasses all types of institutional units

11. A third classification system used by the SNA is the classification of other flows. The other flows classification hierarchy is used to present other changes in assets – either revaluations or volume changes. Other flows represent those changes in value that are not due to transactions (2008 SNA – Glossary).

Table 3 – Classification of other flows

Entries in the other changes in assets account (K codes)
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12. The final classification utilized by the SNA is the classification of stocks. The SNA distinguishes between stocks of assets and stocks of liabilities and according to whether it represents a financial claim or not. Key distinctions in the classification of non-financial assets are made between produced and non-produced assets. Produced assets are broken down between fixed assets, inventories, and valuables. Non-produced assets are broken down between natural resources and contracts, leases and permits and goodwill and marketing assets.

Table 4 – Classification of Stocks

Produced Assets
Non-Financial assets (AN codes)
Fixed Asset by type of asset
Inventories by type of inventory
Valuables
Non-produced Assets
Natural Resources
Contracts, leases and licenses
Purchases less sales of goodwill and marketing assets
Financial Assets (AF codes)
Financial Liabilities (AF codes)

PROPOSED UPDATES TO SNA CLASSIFICATION SYSTEMS

INSTITUTIONAL SECTORS AND FINANCIAL INSTRUMENTS

13. The Paris Agreement on climate change requires countries to establish GHG emissions targets that will support a pathway towards a low-carbon posture and a more climate resilient economy. Substantial funding will be required to finance this transition. This financing will come from both public and private sources and via several financial instruments. It is estimated that global investments required to achieve the Paris Agreement’s temperature and adaptation goals range between US\$3 to \$6 trillion per year until 2050.

14. Various approaches to finance climate mitigation measures and adaptation measures are envisioned and being adopted. While reporting mechanisms, classifications and regulations around sustainable finance are in their infancy and are evolving it would be forward looking to include sustainability type sector and financial instruments detail in the updated SNA institutional sector and financial instrument (transactions in financial assets and liabilities) classifications.

15. A recent trend among investors is to invest in environmental, social and governance (ESG) vehicles for which the purpose is to finance companies that incorporate ESG principles into their operations. While the size and prevalence of these funds is currently small compared to total capital flows for most economies, it may be analytically useful to include new subsectors and financial

instrument breakdowns related to environmental, social and governance (ESG) investment intentions given the likely growth in this type of financing over the next number of decades.

16. ESG collective investment schemes issue investment fund shares or units on their own account, which are then invested in financial assets and non-financial assets that meet the ESG criteria. These type of collective investment schemes are predominately found in the SNA's Non-MMF Investment Funds sub-sectors. Given the going interest in the supply and use of funds for ESG purposes it may be analytical useful to include an "of which" ESG category under subsector S124 in the updated SNA. While this does not capture all the ESG financing in the financial markets it would represent a key signal about investor intentions and the flow of capital to ESG purposes. Given the likely importance of climate finance over the next number of decades within an ESG Investment Funds sector a climate investments funds sector could be separately identified where possible. In fact, for some countries it is likely that the only reliable estimate they will be able to develop is related to climate finance. The AEG/BOPCOM recently endorsed additional sub-sectoring for subsector S124 (see appendix). While these new subsectors are important it is not envisioned that an ESG "of which" category is created for each of these subsectors. It is proposed that a single "of which" category is created under S124.

Non-MMF Investment Funds (S124)

Of Which – Environmental, social and governance Funds

Of which – Climate Adaptation Investment Funds

17. Updating the institutional sector classification is only one avenue to assist users to better understand the sources and uses of funds for ESG purposes. The sources of funds for ESG purposes can also be viewed through financial instruments. More and more financial institutions are offering loans, bonds, and other securities in which the use of the funds raised through these offerings is restricted to ESG purposes. Given the growing trend and the likelihood that this trend will continue for several years it is proposed that the SNA financial instrument classifications be updated to include ESG "of which" categories for the following instruments:

Proposed Financial Instruments Breakdown

- ✓ Debt securities
 - Of which: ESG bonds
 - Of Which: Green Bonds
- ✓ Loans
 - Of which: ESG loans
 - Of Which: Green Loans
- ✓ Equity and investment fund shares
 - Of which: ESG equity and investment fund shares
 - Of which: Green equity and investment fund shares

18. Definitions of ESG and "Green" instruments are evolving and will continue to evolve. For the interim it is recommended that the SNA adopted the following definitions. In the future these definitions may change and should therefore be re-examined closer to the publication date of the updated SNA.

Definitions for Proposed Financial Sub-Instruments

Debt Securities

- Of which: ESG bonds are negotiable financial instruments serving as evidence of debt in which the use of the bond is restricted to finance or refinance activities that sustain or improve the condition of the environment or society. These include green bonds, social bonds, sustainability bonds, and sustainability-linked bonds.

Loans

- Of which: ESG loans are funds lent by creditors to debtors who agree to restrict the use of the funds (in whole or in part) to finance or refinance activities that sustain or improve the condition of the environment of society. These include green loans, social loans, and sustainability loans.

Equity and investment funds

- Of which: ESG equity and investment funds are equity investments by creditors to institutional units who agree to restrict the use of the funds (in whole or in part) to finance or refinance activities that sustain or improve the condition of the environment or society. These include green equity and social equity.

DISTRIBUTIVE TRANSACTIONS

19. Flows of primary income in the national accounts are recorded in the allocation of primary income account. Primary incomes are incomes that flow to institutional units resulting from their “participation” in the production process or through their ownership of assets that are used in the production process. Property income is a component of primary income. Property income flows accrue when the owners of financial assets and natural resources put them at the disposal of other institutional units. The income flow for the use of financial assets is called investment income while the income flow for the use of a natural resource is called rent. A natural resource is defined in the SNA as consisting of naturally occurring resources such as land, water resources, uncultivated forests and deposits of minerals that have an economic value. Currently the SNA recommends recording a single aggregate value for rent from all types of natural resources. Given the growing importance from users to understand the source of revenue from the use of natural resources it is proposed that the following sub-classes of rent be created for mineral resources, non-renewable energy resources and renewable energy resources².

Natural Resource Rent

- Natural Resource Rent – Land
- Natural Resource Rent – Non-renewable energy resources
- Natural Resource Rent – Renewable energy resources
- Natural Resource Rent – Mineral resources
- Natural Resources Rent – Biological Resources
- Natural Resources Rent – Water Resources
- Natural Resources Rent – Other natural resources
- Non-natural resource rent³

² Assuming the current recommendations related to renewable energy resources are endorsed.

³ There is some discussion about introducing the concept of non-natural resource rent into the next version of the SNA. This proposal will need to be updated pending decisions on rent.

20. It is becoming increasingly apparent that over the next number of years governments will need to establish carbon pricing schemes in order to combat the effects of climate change. Two of the more prevalent schemes include carbon taxes and emissions trading schemes. "Taxes are compulsory unrequited payments, in cash or in kind made by institutional units to the general government exercising its sovereign powers. Taxes are described as unrequited because, in most cases, the government provides nothing commensurate in exchange to the individual unit making the payment. A carbon tax can be levied on either the producer or the consumer.

21. An emissions trading scheme is a flexible market mechanism that establishes a maximum level of pollution - a cap. Companies must have a permit to cover each unit of pollution they produce. Each permit stipulates the amount of GHG emissions that can be emitted (quota). As such, each company must have a permit with a sufficient quota of units of emissions to cover their needs. In the initial stages of some emissions trading schemes, permits were given to non-financial corporations freely. As a result, firms did not incur any additional production costs, unless they exceeded their quota and were required to purchase additional permits from others.

22. Currently there are ongoing discussions as to whether emissions trading schemes should be recorded as a tax on production, a rent payment, or the purchase of an existing non-produced non-financial asset. Regardless of the final decision it would be important to clearly distinguish these schemes within the System of National Accounts. Similarly, the concept of a carbon tax should be introduced into the updated SNA. Carbon taxes should be distinguished from Emissions Trading Schemes (ETSs) even if ETSs are recorded as taxes on production. Carbon taxes and ETS could be grouped together under a special government revenue category called Carbon Pricing Mechanisms.

Carbon Pricing Mechanisms

- Carbon Taxes

- Emissions Trading Scheme

23. In addition to developing a supplementary table on carbon pricing mechanisms it could be argued that classes related to environmental taxes and subsidies are added to the classification of transactions in the SNA. The SEEA-CF recommends countries report detailed environmental taxes and subsidies. SEEA-CF define an environmental tax as "***an environmental tax is a tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific, negative impact on the environment.***" Given the concept of environmental taxes and subsidies is well defined in SEEA-CF the question becomes whether this breakdown should also be recommended in the SNA. Given many countries are not yet publishing economic-environmental accounts and the need for this information is becoming increasingly important it is proposed that the SNA incorporate the SEEA-CF concept of environmental taxes and subsidies into the SNA classification of transactions. One possible structure could be:

Taxes on production and imports

Taxes on products

- Value added type taxes

- Taxes and duties on imports excluding VAT

Import Duties

Taxes on imports excluding VAT and duties

Export Taxes

Taxes on products except VAT, import and export taxes

Of which: Environmental taxes on products

Other taxes on production

Of which: Other environmental taxes on production

Subsidies

Subsidies on products

Import Subsidies

Export Subsidies

Other subsidies on products

Of which: Environmental subsidies

Other subsidies on production

Of which: other subsidies on production

24. If ETSs are recorded as a resource rent, then a separate category should be added to natural resource rent - Atmosphere. If ETSs are recorded as a sale of an existing asset, then a separate ETS asset class should be established under Contracts, leases and licenses as noted below. At the October 2022 meeting of the Advisory Expert group on National Accounts it was decided to record Emissions permits as financial assets. Given this decision the breakdown noted below is no longer relevant for the SNA update but is retained in this note for completeness.

Natural Resource Rent

Natural Resource Rent – Atmosphere

Contracts, leases, and licenses

Permissions to use natural resources (AN222)

Of which: Permissions to use the climate regulating services of the Atmosphere.

NON-FINANCIAL ASSETS

25. The SNA currently distinguishes between financial assets and non-financial assets and further delineates non-financial assets between produced assets and non-produced assets. There are three categories of non-produced assets – natural resources, contracts, leases, and licenses and purchases less sales of goodwill and marketing assets. The 2008 SNA recommends decomposing produced non-financial assets into the following groups:

- AN. 111 Dwellings
- AN.112 Other buildings and structures
- AN.113 Machinery and Equipment
- AN.114 Weapons Systems
- AN.115 Cultivated Biological Assets
- AN.116 Ownership Transfer Costs
- AN.117 Intellectual Property Products
- AN.12 Inventories
- AN.13 Valuables

26. Over the next number of decades there is a strong indication that economies will transition towards increased use of renewable non-GHG emitting energy sources to meet the world's energy needs. This will require substantial capital investment as well as disinvestment in the form of the decommissioning of existing oil and gas infrastructure. It will be useful to trace this investment / disinvestment in the national accounts. It is proposed that new classes of produced non-financial assets reflecting investment in nuclear fusion, energy installations, carbon capturing equipment and electric transportation equipment are added to the following asset classes.

- AN.1122 Other structures
 - Of which: Renewable Energy Installations
 - Of which: Fossil Fuel Installations
- AN. 113 Machinery and Equipment
 - AN.1131 Transport Equipment
 - Of which: Electric powered Transport Equipment
- AN. 1133 Other machinery and equipment
 - Of which: Carbon capturing equipment
 - Of which: Nuclear Fusion equipment

27. The SNA currently distinguishes between five types of natural resources: (1) Land, (2) Mineral and energy reserves, (3) non-cultivated biological resources, (4) Water resources, (5) Other natural resources which included radio spectra and other. Since the SEEA-CF provides a detailed breakdown of natural resource assets it could be argued that the current SNA breakdown is sufficient, and any expansion would simply be duplicating recommendations from the SEEA-CF. While that is a valid argument for maintaining the status quo there are a few reasons why an expansion of the SNA detail may be considered. First, the SNA update proposes several new natural resource categories such as renewable energy resources. Second, since many countries do not produce SEEA accounts at this time inclusion in the SNA is a way to make this granularity available to users. Given this rationale, it is proposed that the mineral and energy reserves classification in the SNA be expanded to support the monitoring of the transition towards a low-carbon energy posture.

AN.212 Mineral and energy reserves

- AN.2121 Non-renewable mineral and energy resources
 - AN.21211 Oil resources
 - AN.21212 Natural Gas resources

AN.21213 Other mineral and energy resources

AN.2122 Renewable mineral and energy resources

AN.21221 Wind energy resources

AN.21222 Solar energy resources

AN.21223 Water energy resources

AN.21224 Geothermal energy resources

AN.21225 Other renewable energy resources

28. The above breakdown is consistent with the WSTT guidance note on renewable energy resources as well as the breakdown of resource rent proposed in this note. In addition, to providing additional detail under the mineral and energy reserves asset class, the WSTT guidance note on the recording of cultivated biological assets recommends that the current asset classes AN.115 – cultivated biological assets and AN.213 non-cultivated biological assets be collapsed into a single asset class called Biological Resources. The guidance note on biological resources also recommends breaking down biological resources class into migrating resources and non-migrating resources.

AN.33 Biological Resources

AN.331 Biological resources yielding repeat products

AN.3311 Animal resources yielding repeat products

AN.3312 Tree, crop and plant resources yielding repeat products.

AN.332 Biological resources yielding once-only products.

AN.3321 Migrating biological resources yielding once-only products.

AN.3322 Non-migrating biological resources yielding once-only products

AN.3323 Work-in-progress on non-migrating biological resources.

29. Adopting this structure for Biological Resources introduces an inconsistency into the overall classification hierarchy in the SNA 2008 asset classification hierarchy since Biological Resources now include both produced and non-produced assets. One way to address this issue and at the same time improve the overall presentation of assets within the SNA is to expand and update the first level of the SNA asset classification. The current non-produced asset categories are very heterogenous in which natural resources are lumped together with contracts, leases and licenses and goodwill and marketing assets. In addition the updated SNA will reclassified marketing assets from non-produced assets to as produced assets and recommends satellite extensions of the asset boundary to include human capital (as recommended in the WSTT guidance note on Labor Accounts and Human Capital).

30. Given these reclassifications and satellite extensions this is the opportune time to include additional satellite extensions related to social capital and ecosystems, and also the concept of inclusive or comprehensive wealth into the next version of the SNA. Social capital is defined as *“the networks of relationships among people who live and work in a particular society, enabling that society to function effectively (Oxford Dictionary)”*. It could be argued that given the recent popularity of social networks social capital is taking on greater prominence in many countries. In 2021 the SEEA-Ecosystem Accounting was adopted by the United Nations Statistical Commission as the accounting standard for Ecosystem. The SEEA-EA encourages countries to develop estimates of ecosystem assets. Ecosystem Assets are defined as *“contiguous spaces of a specific*

ecosystem type characterized by a distinct set of biotic and abiotic components and their interactions” (SEEA-EA Glossary). If both social capital and ecosystem assets are added to the SNA asset classification, it seems appropriate to introduce the concept of comprehensive wealth which reflects the “value of all assets a nation has at its disposal” for the well-being of its citizens and the sustainability of its activities⁴. It is recommended that the updated SNA include a definition and discussion of comprehensive wealth and adopt the following asset classification hierarchy:

Assets

Financial Assets

Natural Capital

 Natural Resources

 Ecosystem Assets

Human Capital

Social Capital

Produced Capital (excluding produced natural resources)

Questions for Global Consultation:

1. *Should ESG classes be added to the institutional sector classification for the Non-Money Market Fund Investment Funds sub-sector (S124)?*
2. *Should ESG classes be added to the SNA financial instrument classification?*
3. *Should separate classes of resource rent be established for each natural resource asset recognized within the SNA asset classification?*
4. *Should revenue governments receive from carbon pricing mechanisms be separately identified in the System of National Accounts?*
5. *Should of which categories be created for environmental taxes and environmental subsidies?*
6. *Should Mineral and energy reserves be broken down between “Non-renewable mineral and energy resources” and “Renewable mineral and energy resources?”*
7. *Should additional classes of produced non-financial assets reflecting investment in nuclear fusion, energy installations, carbon capturing equipment and electric transportation equipment be included in the SNA asset classification?*
8. *Do you agree that classes for Human Capital (extension), Ecosystems (extensions) and Social Capital (Extension) should be added to the SNA Asset classification hierarchy, signifying which components represent an extension of the asset boundary?*
9. *Do you agree the concept of comprehensive wealth should be introduced into the updated SNA?*

⁴ <https://www.jstor.org/stable/pdf/resrep21921.5.pdf>

