DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

System of Environmental Economic Accounting

SEEA Central Framework 2028 update

Draft Guidance Note

Issue C.5: Climate mitigation and climate adaptation expenditure

Version for discussion at the SEEA CF Technical Committee meeting on 17-21 November 2025.

Author: Julie L. Hass
With inputs from C5 commenting team: Angelica Tudini, Istat; Viveka Palm, Statistics Sweden (SCB); Bhanumati, IMF; Alessandra Alfieri, IMF; and from the TT-C and London Group Session.

1 Introduction

1.1 Purpose of this Discussion Paper for Guidance Note C.5

1. The aim of the guidance note is to provide guidance on the treatment of issue C.5 'Climate mitigation and climate adaptation expenditure' in the update of the SEEA CF.

Background:

2. The short description of issue C.5: "Climate mitigation and climate adaptation expenditure" from the March 2025 final list of issues endorsed by the UN Statistical Commission (https://seea.un.org/sites/seea.un.org/files/documents/CF_update/seea_cf_issues_final_list_march_2025.xlsx) is:

   > "The integrated framework describes the general framework for environmental transfers. The EPEA covers part of this, namely the expenditure side. Given the great importance of climate expenditure, it warrants for a separate description (module) providing a definition, scope and account (based on the integrated accounts), separately for mitigation and adaptation. This issue links to several initiatives, including green budget tagging, GFS [Government Finance Statistics] and preliminary work done through the DGI [G20 Data Gap Initiative]."

   This issue was given a "0" prioritization rating – meaning it is a "must do" topic for the SEEA-CF revision and its treatment is considered a substantive issue and not simply a textual revision.

3. In the current SEEA-CF 2012 manual, economic activities encompassing efforts to minimize the impact of natural hazards and to mitigate or adapt to climate change were identified in the SEEA-CF research agenda (see §A2.19). In addition, the expansion of the scope of environmental activities was already foreseen well over a decade ago:

   > "A2.19 The SEEA Central Framework limits the scope of economic activities considered to be environmental to environmental protection and resource management activity. However, it is recognized that there are a number of other economic activities that are related to the environment which may be of particular interest for policy and analytical purposes (see sect. 4.2). A specific set of activities encompasses efforts to minimize the impact of natural hazards (such as floods, cyclones and bush fires) and efforts to mitigate, or adapt to, the effects of climate change." (SEEA-CF, §A2.19, Annex II, pages 307-308)

4. Although the SEEA-CF limited the definition of environmental expenditures to environmental protection and resource management (EP-RM) expenditures, there is an increasing number of efforts to describe climate change relevant expenditures. These efforts have been largely developing separately from the SEEA-framework including using budget-tagging and green finance schemes. These ad hoc approaches/methodologies are resulting in different ways of counting and combining information related to climate change related expenditures.

5. There has also been work for climate change related expenditures and for the expenditures for disasters resulting from climate changes that are anchoring these disaster and climate economic activity accounts to the SEEA-CF. It is also worth noting that both Climate Change and Disaster expenditures are also mentioned specifically in Issue C3 – Extending the Scope of Environmental Activities.

6. There are also efforts to establish SEEA-related methodologies at the international level, see for example:

    a. Eurostat's work on climate change mitigation investment (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Investments_in_climate_change_mitigation); and the Eurostat funded project for expenditures on circular economy, climate change mitigation and adaptation, https://circabc.europa.eu/ui/group/b01d2930-990e-44fb-9121-a9a6b00a1283/library/5d95ee90-ff2b-447f-9c55-1d8469922273?p=1&n=10&sort=modified_DESC.

    b. IMF's G20 Data Gaps Initiative (DGI III.7 https://www.imf.org/en/News/Seminars/Conferences/DGI/g20-dgi-recommendations#rec3-7); and

    c. UNESCAP-UNDRR's Disaster-Related Statistics Framework (DRSF) including Disaster Risk Reduction Expenditure and Transfers (DRRE Tables) (see p. 64, and p. 112-113 Tables DRRE_A & DRRE_B of the DRSF manual, https://stat-confluence.escap.un.org/download/attachments/16155350/DRSF%20Manual_20220411.pdf?version=1&modificationDate=1649660412114&api=v2).
    Note: The DRR Expenditure Accounts are currently under further development during the revision of the DRSF manual. The revised DRSF was undergone a global consultation and is now being revised based on the comments received. The DRSF revised manual will be submitted to the UN Statistical Commission in 2026 for approval.

    d. The UNECE's Recommendations on the Role of Official Statistics in Measuring Hazardous Events and Disasters also provides guidance which can be useful when considering nature based disasters that are climate related.

    e. There are also numerous examples of budget tagging that the use of Rio Markers that can be of interest in the context.

7. In addition to the SEEA-related efforts, there are other motivations for including climate change mitigation and adaptation expenditures in the revised SEEA-CF. One major motivation is the growing demand for reliable data on climate change mitigation and adaptation expenditures to support statistical reporting and economic analysis. This demand has spurred numerous efforts to develop these types of statistics. Currently there are various systems are being developed with different definitions and boundaries,

including budget tagging, OECD DAC-climate mitigation and adaptation markers (a.k.a. Rio markers for climate change), and various climate finance schemes, to name a few.

8. These approaches are often only focusing on a portion of the economy or a portion of the expenditures. When this happens, it is the statistical system which needs to take a leadership role to develop robust and internationally recognized methodologies for the development of statistics and accounts covering economic activities related to climate change mitigation and adaptation and associated natural disaster expenditures.

9. Those aspects which are important/critical to C.5 but that will not be thoroughly covered and are dealt with elsewhere, i.e. other Guidance Notes, include:
    a. The present Classification of Environmental Activities (CEA) has two parts, Environmental Protection and Resource Management and needs to be updated in accordance with the Classification of Environmental Purposes (CEP). This issue will be covered in the Guidance Note for issue C.1.
    b. The current definition of environmental activities from that of including only environmental protection and resource management activities based on primary purpose would need to be expanded to include expenditures related to climate change mitigation and adaptation and related to environmental disaster expenditures. This issue will be considered in the Guidance Note for C.3 on "Extending the scope of environmental activities."
    c. The consideration of secondary purpose is important to identify expenditures related to climate change and environmental disasters, since using only the primary purpose will not cover all the relevant expenditures. However, the specific issue of primary and secondary purpose will be covered in the Guidance Note for issue C.4.

10. It is assumed that these Guidance Notes will be expanded in such a way that climate change mitigation and climate change adaptation expenditures as well as expenditures related to efforts to minimize the impact of natural hazards can be included in the revised SEEA-CF. It is assumed that these Guidance Notes will be expanded in such a way that Climate Change related mitigation and adaptation expenditures as well as expenditures related to efforts to minimize the impact of natural hazards can be included in the revised SEEA-CF.

2 Conceptual options and treatments

2.1 Introduction

11. In the past few years, there have been a number of different initiatives to develop climate change expenditure information. In most cases the focus has only been on certain portions of the economy – such as general government – or specific types of climate change financing such as the DAC Rio Markers for climate. The goal for this Guidance Note

is to work towards SEEA-CF /SNA based statistics on CC-mitigation and CC-adaptation expenditure accounts that include all aspects of the economy.

2.2 Definitions of Climate Change (CC) -mitigation, CC-adaptation, and CC-expenditures

12. The starting point is the definition of climate change mitigation and adaptation. From these definitions, the definition of the expenditures that are relevant to climate change will be discussed and proposed.

13. The UN Intergovernmental Panel on Climate Change (IPCC) provides the definition which is used by the UN's climate change agreements and is, by default, the one proposed for usage in the revised SEEA-CF.

2.2.1 Mitigation of Climate Change

14. The Glossary of the International Panel on Climate Change (IPCC) defines the mitigation of climate change as: "A human intervention to reduce emissions or enhance the sinks of greenhouse gases." (https://apps.ipcc.ch/glossary/)

15. There are two components to this definition. The first includes human interventions to reduce emissions, which can be either by direct reductions or substitution, i.e., using different technologies which provide the same output but that result in fewer greenhouse gas (GHG) emissions. The second component is human interventions to enhance sinks for GHG emissions. These sinks can be of a technological nature, or they can be the enhancement of natural sinks.

2.2.2 Climate Change Adaptation

16. The Glossary of the IPCC defines adaptation as:
"In *human systems*, the process of adjustment to actual or expected *climate* and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects." (https://apps.ipcc.ch/glossary/)

17. Again, there are two aspects to this definition. The first focuses on the processes of adjustment needed by human-built systems and the second focuses on the human interventions which facilitate the adjustments of natural systems to changes in climate conditions.

2.2.3 Proposed definitions of climate change expenditures

18. The following is the proposed working definition of **climate change mitigation expenditures**:

    Climate change mitigation expenditures include products and economic activities that serve a climate change mitigation purpose that reduce emissions or enhance the sinks of greenhouse gases, including nature-based sinks. In addition, climate change mitigation products may be designed and produced to have a climate change mitigation primary or secondary purpose (cleaner or more resource-efficient alternative).

19. The proposed working definition of **climate change adaptation expenditures** is:

    Climate change adaptation expenditures include economic activities and products that serve the purpose to substantially reduce, moderate or helps avoid harm in natural ecosystems and in human systems and which maintain or increase adaptive capacity and resilience in response to changing climate conditions.

20. The CC-adaptation definition implies that it is the additional cost or incremental expenditure and not the full cost that should be included for adaptation expenditures since the expenditures are in response to changing climate conditions. This also implies that the expenditure to be included would be some amount over a baseline if the climate was stable.
21. When trying to develop definitions, it can be helpful to take examples of what types of expenditures are expected to be included or excluded and see if the proposed definitions can be used with the expected results. The following sections examine a number of different aspects which can be helpful in the development of definitions.

2.2.4 Proposed definitions vs. other approaches

22. The proposed definitions of CC-mitigation and CC-adaptation expenditures attempt to keep the approach to determining the scope of the expenditures as close as possible to the methodology commonly used in other parts of the SEEA-CF and other official statistics, for example, COFOG-based statistics (COFOG is the Classification of Functions of Government) and environmental protection and resource management expenditures. The CC-expenditures are first evaluated by main purpose – and then, as is used for other SEEA-CF expenditures, the criteria of secondary purpose, and technical aspects are then also considered.
23. If only primary purpose is used, then expenditures that are typically thought of as climate related would often be excluded. Using the proposed approach requires that lists of different activities – products and services – be developed to assist in the compilation of the statistics. Using lists of activities helps improve the international comparability of the statistics.
24. The primary/secondary/technical aspects approach is considered to be better than methods using the intention of the expenditure or the impact of the expenditure. The intention of the actors cannot often be determined and is open to a great deal of interpretation since there is seldom direct information regarding the intention of an expenditure. If an intension criterion is used, then the statistics are typically only covering a portion of government expenditures using a budget analysis and a tagging system that attempts to infer the intention. The impact of the expenditure is very difficult to determine since a cause-and-effect relationship is required as well as needing enough time to pass in order to identify an impact, if any. Due to the difficulties presented by these approaches, the main purpose/secondary purpose/technical specification approach is proposed as the preferred methodology for developing CC-expenditures.
25. The proposal for identifying CC-expenditures includes using a step-by-step approach similar to how environmental protection (EP) and resource management (RM) expenditures are identified and especially the stepwise approach used for developing Environmental Goods and Services

statistics. Although CC-expenditures have a wider scope than EP and RM expenditures, the proposed methodology for analysing and identifying CC-expenditures is rooted in SEEA-CF approaches that are used for developing environmental economic statistics.

2.3 Separate accounts for CC-mitigation and CC-adaptation expenditures

26. The issue definition for C.5 states that a separate module for CC-expenditures be developed with a definition, scope and account separately for climate change mitigation expenditures and for climate change adaptation expenditures.

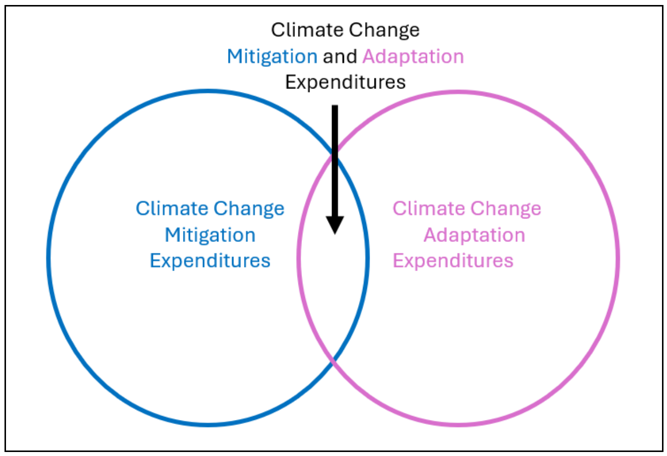
27. If CC-mitigation expenditures are totally separate from CC-adaptation expenditures then the two expenditure accounts could be additive, and when put together, total CC-relevant expenditures could be determined. The following diagram shows this potential relationship.

2.3.1 Overlapping economic activities are considered relevant to both mitigation and adaptation

28. However, due to economic activities which are considered relevant to both mitigation and adaptation, there is an overlapping area of mitigation and adaptation products and activities. Due to overlapping of these categories, an additive relationship comes into question. This becomes more obvious when one starts to work at the product and activities level to classify them into various CC-mitigation or CC-adaptation categories.

29. When developing lists of products and activities which are considered relevant to mitigation or adaptation, some of these products and activities can be considered as relevant to both. For example, re-planting mangroves are a mitigation activity since they provide the function of carbon capture & storage; and this is an adaptation activity since they provide coastal protection from storms. Another example is adding insulation to buildings – this reduces energy consumption for heating and cooling and is thus a product that contributes to fewer emissions from energy production. Insulation in buildings is also part of adapting human systems to more extreme temperatures. When you really start working at the product and activity level this classification conundrum appears. There are both nature-based and technology-based activities that can be counted as both CC-mitigation and CC-adaptation expenditures.

30. Since there are products and activities that are relevant to both CC-mitigation and CC-adaptation expenditures, this means that these are overlapping accounts, and if they are added together to provide a total CC-expenditure account, there will be double counting. In this situation, if separate accounts are developed, then they are not additive and no total for climate change expenditures can be directly made by the sum of mitigation plus adaptation expenditures. The following diagram shows this type of relationship between mitigation and adaptation expenditures:



31. It may be possible to classify products and activities into only one climate change major category, i.e. either mitigation or adaptation but this would need to be done in a way that there are no overlapping items and no double counting if added together.

2.3.2 Scope – what is in/out

32. The scope is delineated by the definitions of the climate change mitigation expenditures and climate change adaptation expenditures. As with environmental protection and resource management expenditure statistics it is expected that lists of activities and products will need to be established to provide guidance for developing these statistics. Some experience and experimentation will be needed to establish the lists of activities and products which should be included in these statistics. As part of this development, the CC-expenditure area needs to be identified so countries know why these expenditures are included.

33. An example of this type of product/service to expenditure categories is shown by the Eurostat Environmental Goods and Services Sector List of Environmental Products – of which a portion is shown below:

				EGSS minimum list of products																		
				Environmental domain: CEPA and CReMA Classifications																		
CPA 2008 CODE	CPA 2008 DESCRIPTION	% EGS	Short description of the EGS which are included in the code	1	2	3	4	5	6	7	8	9	10	11A	11B	12	13A	13B	13C	14	15	16
01	Products of agriculture, hunting and related services	to be determined	organic agricultural products				X															
02	Products of forestry, logging and related services	to be determined	fuel wood											X	X		X					
03	Fish and other fishing products; aquaculture products; support services to fishing	to be determined	fish, crustaceans and other molluscs farmed													X						
20.14	Other organic basic chemicals	to be determined	Ethyl alcohol, wood charcoal …														X					
20.59.59	Miscellaneous other chemical products n.e.c.	to be determined	Biofuels														X					

For example, a climate change mitigation expenditure could be the improvement of soils, leading to additional soil carbon storage from organic crop farming techniques – shown here in row 01, Products of agricultural and CEPA 4. Another example is in row 20.59.59 Misc other chemical products, which includes Biofuels, another CC-mitigation product. This matching between the product and why the product is included is very helpful for developing the statistics and needs to be done for climate change mitigation and adaptation expenditures. If only the product or service is added to a list of relevant products and services, then it can be difficult to determine as to why it was included and what the climate change relevant activity is.

34. In order to develop internationally comparable statistics defining a core list of climate change relevant products and services will be needed. Since there is no official classification system beyond mitigation and adaptation, the development of a more detailed classification system will need to be considered.

2.4 Expenditure variables for CC-mitigation and CC-adaptation account

35. Climate Change Expenditure Accounts would ideally include the main economic variables of output, imports, exports, intermediate consumption, final consumption, and gross capital formation. These would be split by institutional sectors and the total economy. See Table 2.4.1 for a summary table. Please note that there is no column included for total climate change expenditures – since this depends on whether the CC-mitigation and CC-adaptation expenditures are additive or not.

36. The following table presents a summary form of the CC-mitigation and CC-adaptation account.

Table. 2.4.1 Climate Change Mitigation and Adaptation Expenditure Account Variables

	Institutional Sector	CC-Mitigation	CC-Adaptation
Output	**Total economy**		
	Corporations		
	Households		
	General Government		
Imports	**Total economy**		
	Corporations		
	Households		
	General Government		

	Institutional Sector	CC-Mitigation	CC-Adaptation
Exports	**Total economy**		
	Corporations		
	Households		
	General Government		
Intermediate Consumption	**Total economy**		
	Corporations		
	Households		
	General Government		
Final Consumption	**Total economy**		
	Households		
	General Government		
Gross Capital Formation	**Total economy**		
	Corporations		
	Households		
	General Government		

37. If mitigation and adaptation are additive, then another column could be included in Table 2.4.1. And in this case the intermediate consumption would be estimated using a Supply and Use Table (SUT) that includes both mitigation and adaptation products and services. See Table 2.4.2.

Table 2.4.2a & b SUT for Climate Change Expenditures – with mitigation and adaptation
(Note: assumes CC-mitigation and CC-adaptation expenditures are additive)

Supply Table (Products x Industries)

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="3">Industries</td><td rowspan="2">Imports</td><td rowspan="2">Total</td></tr>
<tr><td>Climate Change mitigation activities</td><td>Climate change adaptation activities</td><td>Other activities</td></tr>
<tr><td rowspan="3">Products</td><td>Climate Change mitigation products</td><td colspan="3" rowspan="3">Output of industries by product</td><td rowspan="3">Imports by product</td><td rowspan="3">Total supply by industry</td></tr>
<tr><td>Climate change adaptation products</td></tr>
<tr><td>Other products</td></tr>
<tr><td colspan="2">Total</td><td colspan="3">Total output by industry</td><td>Total imports</td><td>Total supply</td></tr>
</table>

Use Table (Products x Industries)

	Industries	Final Uses	Total

		CC-Mitigation Activities	CC-Adaptation Activities	Other Activities	Final Consumption	Gross Capital Formation	Exports	
Products	CC-mitigation products	Intermediate consumption by product and by industry			Final uses by product and by industry	Gross Capital Formation	Exports by product	Total use by product
	CC-Adaptation products							
	Other products							
Value Added		Value Added by component and by industry			Not applicable			Total value added
Total		Total output by industry			Total Final uses by category			

Source: Based on the IMF's DGI work.

38. If the CC-mitigation and CC-adaptation expenditures are NOT additive, then no total column can be included in Table 2.4.1 and there would need to be two separate SUTs to estimate the intermediate consumption. See Tables 2.4.3 and 2.4.4.

39. **Table 2.4.3 SUT for Climate Change Mitigation Expenditures**
(Note: CC-mitigation and CC-adaptation expenditures are NOT additive)

40. Supply Table (Products x Industries) – Mitigation only

		Industries		Imports	Total
		Climate Change Mitigation activities	Other activities		
Products	Climate Change Mitigation products	Output of industries by product		Imports by product	Total supply by industry
	Other products				
Total		Total output by industry		Total imports	Total supply

41. Use Table (Products x Industries) – Mitigation only

	Industries		Final Uses			Total
	CC-Mitigation Activities	Other Activities	Final Consumption	Gross Capital Formation	Exports	

<table>
<tr><td rowspan="2">Products</td><td>CC-mitigation products</td><td rowspan="2">Intermediate consumption by product and by industry</td><td rowspan="2">Final uses by product and by industry</td><td rowspan="2">Gross Capital Formation</td><td rowspan="2">Exports by product</td><td rowspan="2">Total use by product</td></tr>
<tr><td>Other products</td></tr>
<tr><td colspan="2">Value Added</td><td>Value Added by component and by industry</td><td colspan="3">Not applicable</td><td>Total value added</td></tr>
<tr><td colspan="2">Total</td><td>Total output by industry</td><td colspan="3">Total Final uses by category</td><td></td></tr>
</table>

42. **Table 2.4.4 a & b SUT for Climate Change Adaptation Expenditures**
(Note: CC-mitigation and CC-adaptation expenditures are NOT additive)

43. Supply Table (Products x Industries) – Adaptation only

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Industries</td><td rowspan="2">Imports</td><td rowspan="2">Total</td></tr>
<tr><td>Climate change adaptation activities</td><td>Other activities</td></tr>
<tr><td rowspan="2">Products</td><td>Climate change adaptation products</td><td colspan="2" rowspan="2">Output of industries by product</td><td rowspan="2">Imports by product</td><td rowspan="2">Total supply by industry</td></tr>
<tr><td>Other products</td></tr>
<tr><td colspan="2">Total</td><td colspan="2">Total output by industry</td><td>Total imports</td><td>Total supply</td></tr>
</table>

44. Use Table (Products x Industries) – Adaptation only

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Industries</td><td colspan="3">Final Uses</td><td rowspan="2">Total</td></tr>
<tr><td>CC-Adaptation Activities</td><td>Other Activities</td><td>Final Consumption</td><td>Gross Capital Formation</td><td>Exports</td></tr>
<tr><td rowspan="2">Products</td><td>CC-Adaptation products</td><td colspan="2" rowspan="2">Intermediate consumption by product and by industry</td><td rowspan="2">Final uses by product and by industry</td><td rowspan="2">Gross Capital Formation</td><td rowspan="2">Exports by product</td><td rowspan="2">Total use by product</td></tr>
<tr><td>Other products</td></tr>
<tr><td colspan="2">Value Added</td><td colspan="2">Value Added by component and by industry</td><td colspan="3">Not applicable</td><td>Total value added</td></tr>
<tr><td colspan="2">Total</td><td colspan="2">Total output by industry</td><td colspan="3">Total Final uses by category</td><td></td></tr>
</table>

45. Whether CC-mitigation expenditures and CC-adaptation expenditures are additive or not is an important aspect to decide since it determines whether total Climate Change expenditures can

be developed or not. And how intermediate consumption is determined is also dependent on whether adaptation and mitigation expenditures are additive or not.

2.5 Work on developing a classification of CC-mitigation and CC-adaptation expenditures

46. Currently, the only classification of expenditures related to climate change is the two large groupings of CC-mitigation expenditures and CC-adaptation expenditures. There are no subgroupings or lists of products and activities to be included in these proposed CC-expenditure accounts that have been agreed upon.

47. However, Eurostat and the European Statistical System has started using the Classification of Environmental Purposes (CEP) and extending it to include activities and products that are considered climate change mitigation relevant but are not considered environmental protection or resource management expenditures. This approach appears to be promising.

48. Discussions about climate change adaptation expenditures have indicated that there needs to be a different classification than the CEP. It would appear that some type of hazard or disaster related categories would perhaps be a good approach. The IMF has done the most advanced work in relation to their DGI 3, recommendation 7 reporting template.

2.5.1 CEP classification and CC-mitigation and adaptation activities

49. In the Classification of Environmental Purposes (CEP) the mitigation activities and products are largely found in the following CEP categories:

    a. CEP 0101 Reduction and control of greenhouse gases

    b. CEP 0201 Energy from renewable sources

    c. CEP 0202 Energy savings and management

50. Expenditures that include the following would also be included under these mitigation measures (CEP 0101, 0201, 0202):

    d. Carbon capture and sequestration technologies

    e. Tradeable permits

    f. Carbon taxes

51. Natural systems can be improved by human actions to try to improve carbon fixation and storage of carbon containing organic materials. These types of activities would be found in the following CEP categories:

    g. CEP 0501 Protection of soil, surface and groundwater (portion of category: soil)

    h. CEP 0502 Protection of biodiversity and landscape

    i. CEP 0503 Management of forest resources (including forest fire prevention and fighting)

52. Activities which are not considered environmental protection or resource management activities, but which would be considered a CC-mitigation activity need to be identified. For

example, electricity and heat production from non-carbon emitting nuclear sources would be included in CC-mitigation expenditures but energy production from nuclear sources is not considered an environmental activity or as renewable energy so is not part of the CEP.

53. Public transportation has a primary purpose of transportation and not reduction of GHG-emissions, although public transportation can have an effect on GHG-emissions. This is another category excluded from CEP but which is considered at least partially relevant to CC-mitigation expenditures. Another example is the production of crops, such as corn, that are further processed into biofuels. These are not in CEP but are part of CC-mitigation.

54. In addition, what is not thoroughly described in the CEP as being CC-mitigation activities, but which result in mitigation, are the human interventions to enhance the sinks of greenhouse gases. Part of this is included in the revised CEP, but only the human inventions of carbon capture technologies and services.

55. The human interventions which help the natural systems to absorb carbon are not identified as mitigation activities in the descriptions of the relevant categories in the annex of the CEP document. These would include actions that increase carbon storage in soils, such as organic farming. And also, some forest management, forest fire prevention, fighting forest fires, re-planting burned or harvested forest areas, re-establishing mangroves, preserving wetlands, etc. These activities would also need to be described as CC-mitigation in an expanded CEP for CC-mitigation. The annex to the European Commission document for the CEP is a helpful start for identifying climate change mitigation activities but a more thorough analysis of the nature-based aspects needs to be evaluated and included in mitigation expenditures.

56. Expenditures classified using the CEP also include some climate change adaptation expenditures. For example, building insulation products would be classified in CEP 0202 Energy savings and management since insulating structures results in less energy use. But these expenditures on building insulation are also important for humans trying to adapt to greater temperature swings – both hotter and colder temperatures resulting from a changing climate.

57. CEP is most easily used for mitigation expenditures and basically needs some additions to allow for non-EP/RM expenditures. CEP also has some categories that apply to adaptation expenditures, but it is not sufficient for most adaptation expenditures.

58. These examples show that the revised CEA, the Classification of Environmental Purposes (CEP) is not adequate for CC-expenditures, and the CEP needs to be expanded for covering the mitigation expenditures that are fairly close to environmental protection/resource management (EP/RM). In addition, there needs to be a separate, but related, climate change adaptation expenditure classification developed.

2.5.2 OECD DAC climate markers

59. The OECD's Handbook on the OECD-DAC Climate markers provides some examples of climate change adaptation activities. These descriptions could be useful when developing extensive lists of the CC-mitigation and CC-adaptation expenditures to include. The following is the brief description of the climate change adaptation marker (see page 4 in the OECD Handbook):

b.

EXAMPLES OF TYPICAL ACTIVITIES	*The list is not exhaustive. The activities may be scored against the objective only if the above criteria for eligibility are fulfilled.*
1. Examples of typical enabling activities for adaptation Environmental policy and administrative management (sector 41010) Environmental education / training (sector 41081) Environmental research (sector 41082)	• Supporting the integration of climate change adaptation into national and international policy, plans and programmes. • Improving regulations and legislation to provide incentives to adapt. • Education, training and public awareness raising related to the causes and impacts of climate change and the role of adaptation. • Adaptation-related climate research including meteorological and hydrological observation and forecasting, impact and vulnerability assessments, early warning systems, etc.
2. Examples of typical sectoral activities Health (Sector 120) Water and sanitation (Sector 140) Agriculture (Sector 311) Forestry (Sector 312) Fishing (Sector 313) Flood prevention/control (Sector 41050 under Gen. env. protection) Disaster prevention and preparedness (Sector 740)	• Implementing measures to control malaria in areas threatened by increased incidence of diseases due to climate change. • Promoting water conservation in areas where enhanced water stress due to climate change is anticipated. • Promoting heat and drought resistant crops and water saving irrigation methods to withstand climate change. • Promoting a diverse mix of forest management practices and species to provide a buffer against uncertainties of climate change. • Promoting changes in fishing practices to adapt to changes in stocks and target species. Introducing flexibility in the gear that is used, the species that are fished, the fishing areas to be managed, and the allocations that are harvested. • Implementing measures for flood prevention and management such as watershed management, reforestation or wetland restoration. • Developing emergency prevention and preparedness measures including insurance schemes to cope with potential climatic disasters. • Implementing measures to respond to glacial lake outburst flood risk, such as the creation or improvement of early warning systems and widening or deepening of glacial lake outlet channels.

2.5.3 Disaster-Related Statistics Framework (DRSF) and the Hazards classification for Sendaii

60. Disaster risk reduction (DRR) expenditure accounting includes an expenditure account and a transfer account. The expenditures and transfers included in the DRR expenditure accounts are only those undertaken with DRR as their primary purpose.

61. The expenditure account includes A. Recurrent expenditure (intermediate + final consumption) and B. Investment expenditure (gross fixed capital formation), with C. Supplementary information, specifically acquisition of land for DRR purposes. These 3 variables are summed, A+B+C, to give Total DRR expenditure (recurrent expenditure + investment expenditure).

62. The disaster expenditure variables, A and B, are categorized by 4 disaster risk categories plus General Government, research & development, education activities. The 4 disaster risk categories are: 1. Disaster risk prevention, 2. Disaster risk mitigation, 3. Disaster preparedness and response, and 4. Disaster recovery. These are the rows of the table.

63. The columns of the expenditure account table are the institutional sectors and the Rest of the World (RoW). See Table 6.2 of the Draft Global Disaster-Related Statistics Framework, Chapter 6 of the global consultation version of the manual (https://www.undrr.org/media/109265).

64. The Transfer account – see Table 6.3 of the Draft Global Disaster-Related Statistics Framework, Chapter 6 of the global consultation version of the manual (https://www.undrr.org/media/109265). This account shows the transfers made by all of the various institutional sectors and RoW to the various institutional sectors and RoW. This produces a table transfers made by X transfers received by table.

65. Unfortunately, the DRR expenditure tables do not separate out the expenditures relevant to disasters related to a changing climate. Industrial accidents, toxic spills, most nuclear reactor accidents, volcanic eruptions, cyber-attacks, and other non-climate change disasters would be part of the DRR expenditures but would not be considered climate change related disasters. So not all DRR expenditures would be included as CC-expenditures but many flood, wind, temperature (heat and cold), and fire disaster expenditures would be relevant as CC-expenditures.

66. However, these two tables could form a basic framework for the further development of CC-expenditure accounts. The first is the expenditure account including A. Recurrent expenditure (intermediate + final consumption), and B. Investment expenditure (gross fixed capital formation). The second table includes transfers.

Table 6.2: Expenditure account (units: Local currency, US$PPP)

		Institutional sectors											
				General government (incl. non-profit institutions controlled by governments and social security)				Households					
		Non-financial corporations	Financial corporations	Central government	State government	Local government	***Subtotal General government***	Households owners of unincorporated enterprises	Employees and recipients of property and transfer incomes	***Subtotal Households***	Non-profit institutions serving households (NPISHs)	***TOTAL Resident sectors*** *(units with > 1 year of activity)*	***Rest of the World (RoW)***
A	**Recurrent expenditure (intermediate + final consumption)**												
1	**Disaster risk prevention**												
1.1	*Risk prevention before disasters*												
1.2	*Risk prevention in or after disasters*												
2	**Disaster risk mitigation**												
2.1	*Structural measures*												
2.2	*Non-structural measures*												
2.3	*Land-use planning*												
2.4	*Early warning systems management*												
3	**Disaster preparedness and response**												

Expenditure Account Table continued

		reduction													
		Subtotal for recurrent expenditure													
B	Investment expenditure (gross fixed capital formation)														
	1	**Disaster risk prevention**													
	1.1	*Risk prevention before disasters*													
	1.2	*Risk prevention in or after disasters*													
	2	**Disaster risk mitigation**													
	2.1	*Structural measures*													
	2.2	*Non-structural measures*													
	2.3	*Land-use planning*													
	2.4	*Early warning systems management*													
	3	**Disaster preparedness and response**													
	3.1	*Preparedness*													
	3.2	*Emergency management*													
	3.3	*Emergency supply of commodities*													
	3.4	*Other disaster response activities*													
	4	**Disaster recovery**													
	4.1	*Relocation*													
	4.2	*Rehabilitation*													
	4.3	*Reconstruction*													
	5	**General government, research & development, education activities**													
	5.1	*General government activities for disaster risk reduction*													
	5.2	*Research and development, risk assessment, and information activities*													
	5.3	*Education activities for disaster risk reduction*													
		Subtotal for investment expenditure													
C	Supplementary information														
		Acquisition of land for DRR purposes													
		...													
Total DRR expenditure (recurrent expenditure + investment expenditure)															

Table 6.3: Transfer account (units: Local currency, US$PPP)

			Transfers received by												
			Institutional sectors												
					General government (incl. non-profit institutions controlled by governments and social security)				Households						
			Non-financial corporations	Financial corporations	Central government	State government	Local government	***Subtotal General government***	Households owners of unincorporated enterprises	Employees and recipients of property and transfer incomes	***Subtotal Households***	Non-profit institutions serving households (NPISHs)	***TOTAL Resident sectors*** *(units with >1 year of activity)*	***Rest of the World (RoW)***
Transfers made by	Institutional sectors		Non-financial corporations												
			Financial corporations												
		General government (incl. non-profit institutions controlled by governments and social security)	Central government												
			State government												
			Local government												
			Subtotal General government												
		Households	Households owners of unincorporated enterprises												
			Employees and recipients of property and transfer incomes												
			Subtotal Households												
			Non-profit institutions serving households (NPISHs)												
			TOTAL Resident sectors *(units with >1 year of activity)*												
			Rest of the World (RoW)												

67. There are two interesting perspectives in the reporting tables for the DRSF. The first is from the Disaster Risk Reduction Expenditure Accounts (DRREA) tables which use categories that are disaster related expenditures, but which can also include expenditures for CC-adaptation. The second is from the physical disaster reporting tables which use a hazard classification which also identifies those hazards that are climate change related.

68. The DRREA expenditures in the categories for 1. Disaster risk prevention, 2. Disaster risk mitigation, 3. Disaster preparedness and response, and 4. Disaster recovery

69. The first two stages, prevention and mitigation, can include many climate change adaptation expenditures. Also the 4th stage, disaster recovery, can have some CC-adaptation expenditures since the disaster recovery will include re-building structures and infrastructure which can be built in ways that reflect expected changes in storm strength.

70. From the physical reporting we find an overlap with the hazard classification used for reporting in the Sendai Framework. The broad hazard categories include:

Type	Description
Geophysical	a hazard originating from solid earth, a.k.a., geological hazard

Hydrological	a hazard caused by the occurrence, movement, and distribution of surface and subsurface freshwater and saltwater.
Meteorological	a hazard caused by short-lived, micro- to meso-scale extreme weather and atmospheric conditions that last from minutes to days
Climatological	a hazard caused by long-lived, meso- to macro-scale atmospheric processes ranging from intra-seasonal to multi-decadal climate variability
Biological	a hazard caused by the exposure to living organisms and/or their toxic substances (e.g. venom, mold) or vector-borne diseases that they may carry. Examples are venomous wildlife and insects, poisonous plants, algae blooms, and mosquitoes carrying disease-causing agents such as parasites, bacteria, or viruses (e.g., malaria).
Other	Extraterrestrial, technological, others n.e.c.

71. Climate change related disasters can be identified in the hydrological, meteorological, and climatological categories.
72. Two other concepts from the hazard work which are applicable to this context are a slow-onset disaster and a sudden-onset disaster. Climate change can result in either or both of these types of occurrences.
    - A **slow-onset disaster** emerges gradually over time. Slow-onset disasters could be associated with, e.g., drought, desertification, sea level rise, epidemic disease .
    - **A sudden-onset disaster** is one triggered by a hazardous event that emerges quickly or unexpectedly. Sudden-onset disasters could be associated with, e.g., earthquake, volcanic eruption, flash flood, chemical explosion, critical infrastructure failure, and transport accident.
73. And finally, there is the cascading multiple-hazard disaster which often occurs with climate change related events.
    - A **cascading multiple-hazard disaster occurrence** is a disaster in which one type of hazard, such as a strong storm, causes one or more additional hazards, e.g., flooding or landslides, creating combined impacts to the population, infrastructure and the environment. Cascading multiple-hazard are not two events with proximate timing or locations by coincidence. They are events that are causally linked to the same original trigger hazard and thus are part of a single (multi-hazard) disaster occurrence.
74. The Disasters-Related Statistics Framework (DRSF) can also be a useful set of information and tables that can inform the development of CC-expenditure accounts.

2.5.4 IMF's DGI 3, Rec 7 Reporting Template for Climate Change Mitigation and Adaptation Expenditures

75. The work by the IMF on DGI 3, recommendation 7 is the most advanced development towards climate change expenditure accounts and the only one that is tailored specifically for both CC-mitigation and CC-adaptation expenditures.

76. As a part of this work, a list of products that are to be used for reporting has been developed. The variables for reporting include output, imports, exports, intermediate consumption, Gross capital consumption, and final consumption. Each of these variables are then split for reporting into total economy, corporations, households, general government, with final consumption split only by total economy, households and general government.

77. In the reporting templates, there is a reporting list of products for both climate change adaptation expenditures and climate change mitigation expenditures. A three-level product code nesting classification has also been developed. This classification system helps identify some of the products that would be included in the reporting. The following is the IMF's product list from the Draft reporting template from February 2025. The product codes starting with CM are climate mitigation products, and the product codes starting with CA are climate adaptation products.

LIST OF PRODUCTS INCLUDED IN THE REPORTING TEMPLATE

Product Code			Product
			CLIMATE MITIGATION PRODUCTS
CM1			***Low-carbon Energy***
	CM11		***Non-GHG Emitting Energy Products***
		CM111	*Solar panels*
		CM112	*Wind turbines*
		CM113	*Hydroelectric power plants*
		CM114	*Nuclear reactors*
CM2			***Energy Efficiency***
	CM21		***Energy Efficiency Products***
		CM211	LED light bulbs
		CM212	High-efficiency heating and cooling systems
		CM213	Energy-saving appliances.
CM3			***Non-GHG emitting transport***
	CM31		***Non-GHG Emitting Transportation Products***
		CM311	Electric vehicles (EVs)
		CM312	Electric bicycles
		CM313	Hydrogen fuel cell buses.
	CM32		***Non-GHG Emitting Public Transportation Products***
		CM321	Electric buses and trains
		CM322	Solar-powered tram systems
		CM323	Cable-propelled transit systems.
CM4			***Carbon Capture and Storage Products***
	CM41		***Carbon Capture and Storage Products***
		CM411	Carbon capture facilities
		CM412	Carbon sequestration technologies
		CM413	Industrial carbon utilization equipment.
CM5			***GHG removals by sinks***
	CM51		***Afforestation and Reforestation Products***
		CM511	Tree saplings for planting
		CM512	Drone seed dispersal systems
		CM513	Forest management and monitoring software.
CM6			***Organic agriculture***

CM61		***Non-GHG Emitting Agriculture Products***
	CM611	Organic fertilizers
	CM612	No-till farming equipment
	CM613	Biochar
	CM614	Methane digesters for livestock waste.
Product Code		**Product**
		CLIMATE ADAPTATION PRODUCTS
CA1		***Construction, installation, repair and other related products***
CA11		***Flood Protection and Adaptation Products***
	CA111	Flood barriers
	CA112	Elevated structures
	CA113	Wetlands restoration
	CA114	Flood warning systems.
CA12		***Sea Level Rise Protection and Adaptation Products***
	CA121	Sea walls
	CA122	Mangrove restoration
	CA123	Raised walkways and buildings.
CA2		***Specifically designed products moderating harm from different types of natural hazards***
CA21		***Drought Protection and Adaptation Products***
	CA211	Drought-resistant crops
	CA212	Rainwater harvesting systems
	CA213	Water recycling and reuse technologies.
CA22		***Wildfires Protection and Adaptation Products***
	CA221	Fire-resistant building materials
	CA222	Controlled burn equipment
	CA223	Wildfire detection and monitoring systems.
CA23		***Disease Outbreak Products***
	CA231	Vector control products (e.g. mosquito nets)
	CA232	Disease monitoring systems and vaccines.
CA24		***Extreme Temperatures Protection and Adaptation Products***
	CA241	Heating and cooling systems
	CA242	Reflective roofing materials
	CA243	Green roofs
	CA244	Efficient HVAC systems.
CA3		***Architectural, engineering and other professional products***
CA31		***Landslides Protection and Adaptation Products***
	CA311	Retaining walls
	CA312	Drainage systems
	CA313	Landslide sensors and monitoring equipment.
CA32		***Melting Glaciers and Ice Caps Protection and Adaptation Products***
	CA321	Glacier monitoring systems
	CA322	Protective barriers for glacier-fed lakes
	CA323	Adaptive water management systems for river flows.
CA33		***Ecosystem Shifts Protection and Adaptation Products***
	CA331	Restoration of native vegetation and wildlife corridors
	CA332	Invasive species management tools.
CA34		***Ocean Acidification Protection and Adaptation Products***
	CA341	Water quality monitoring equipment
	CA342	Alkalinity enhancement techniques

CA343 Shellfish farming adaptation methods.

It is worth noting that this reporting template assumes that there are no products which are included as both adaptation and mitigation expenditures. This approach also assumes that CC-mitigation and CC-adaptation expenditures are additive – see Section 2.4 above for examples of the SUTs.

2.5.5 Classification conclusion

78. These types of lists, disaster categories, and previous work developing both disaster expenditures and CC-expenditures would be helpful in the further work towards developing a comprehensive list of which activities should be included in the CC-mitigation and CC-adaptation expenditure accounts. These lists must not only name categories of products and services, but they also need to explain why they are included as climate change expenditures.

79. It is only when discussing the particulars of certain topics that the scope and boundary issues become clear. For example, some would argue that all public transportation should be included as a climate change mitigation expenditure, others would argue that only the electrified portion of public transportation should be included, while still others would say that the only the portion of the electrified portion of public transportation which are using non-GHG emitting energy sources should be included. The same reasoning can be used for train transportation, automobiles, etc.

80. Connecting the climate change mitigation and adaptation products to the product and industry codes used in official statistics (ISIC, NACE, NAICS, CPC, CN, NAPCS) is also needed. You will not find a product called “flood barriers” in the official product codes. Each component/product used in constructing and maintaining the flood barriers would need to be identified before the related expenditures could be identified. And then the portion of that product category, such as cement, that is used in the flood barriers would need to be estimated. As always finding this portion of a larger product grouping is a major challenge and finding this supplementary data is difficult. In the case of flood barriers, there may be some information based on construction statistics that could be helpful.

2.5.6 Other topics, for example, full cost or extra/incremental cost?

81. There will be a number of technical topics that will also need to be addressed. One of these is whether the full cost is included or whether only the extra/incremental cost included as the expenditures. These topics will be of great importance since these decisions can make a big difference in the size of the figures. These topics needs addition discussion and work and it may be the case that for some products the full cost is used while in other cases only the incremental or extra cost is included.

2.6 Climate Change Expenditure Account - proposal

82. On the one hand, developing a full EPEA-type of detailed accounts is very appealing, however, is it realistic? Since a full account has only been developed for environmental protection expenditures and one has not been developed for resource management expenditures, some

caution may be warranted. Stepwise development towards CC-expenditure accounts is perhaps more realistic. Establishing a framework could be helpful so that as different aspects are developed, how the parts relate to the whole can be useful guidance.

83. Advocating the use of a supply-use (SUT) methodology, as the IMF proposes, is only possible if a country has SUTs. Admittedly this approach allows for internally consistent figures and the estimation of intermediate consumption, but the major challenge of this approach is to determine the portions of the product groups which are relevant to climate change mitigation and adaptation. Typically, this requires a great deal of supplementary data from other sources.

84. For countries without detailed SUTs, another framework of tables needs to be developed. The lists of relevant mitigation and adaptation products and services can be used regardless of the method of assembling the figures and developing some parts of the CC-expenditure accounts.

85. Climate change mitigation expenditures appear to be easier to identify and find in product lists. Climate change adaptation expenditures, on the other hand, are more diffuse and will require additional descriptions to know what should be included or excluded. In both cases, much more work is needed to develop the lists of products and services which are relevant to climate change expenditures and to explain why these are relevant for inclusion.

3 Recommendations on conceptual treatments

3.1 Introduction

86. Although specific topics have been presented in Section 2, some of these proposals require specific conceptual choices. In this section these choices are pointed out.

3.1.1 Definitions of CC-mitigation and CC-adaptation expenditures

87. The definitions of climate change mitigation and climate change adaptation expenditures are key to the development of these statistics. They define the scope and what is being counted. Getting these definitions as clear and precise as possible is important.

3.1.2 Relationship of CC-mitigation and CC-adaptation expenditures: Additive or not? Total CC-expenditures or not?

88. Even from a brief examination of the types of expenditures that are relevant to climate change, it becomes clear that a number of types of expenditures could be classified as both mitigation and adaptation expenditures. Exactly what to do with these types of expenditures needs to be carefully considered.

89. If these expenditures are included in both the mitigation and the adaptation categories, then these expenditures are not additive due to double counting. A total for CC-mitigation expenditures and a separate total for CC-adaptation expenditures can be calculated but no overall total can be calculated for climate change expenditures.

90. It might be possible to artificially decide into which category, mitigation or adaptation, each of the dual-purpose products and services will belong and to force the categories to not overlap. If this is the case, then a total for CC-expenditures is theoretically possible.

91. A decision regarding the issue of additivity is needed since this will also influence how different products and services are classified – into mitigation or into adaptation. It will also determine how intermediate consumption is estimated.

3.1.3 Lists or not – and partial or whole

92. It appears that lists of products/services/activities are needed to be able to develop these statistics. The lists need to be in more detail than have been developed so far. Developing these types of lists requires a significant amount of work including hours of discussions, evaluations and consultations. Given the timeframe available, this may not be feasible. More generalized lists may be the best that can be accomplished in the time available.

93. This same type of situation also exists with relation to the inclusion of full cost or the marginal/additional cost. In some cases, using the full cost would be appropriate, whereas in other cases only including the marginal/additional cost would be appropriate. Typically, these decisions are made at a very detailed level.

94. Due to the timeframe for the SEEA-CF revision, it may only be possible to work at fairly aggregated levels and provide mostly high-level recommendations.

3.1.4 Treatment of transportation as mitigation (secondary purpose)

95. Public transport's primary purpose is transportation. Within a climate change perspective, it could also be considered as a mitigation, or even an adaptation, action. If fewer fossil fuel burning vehicles are used, because people use public transport, then this could be a mitigation activity since there are fewer GHGs emitted per passenger-km.

96. A similar argument can be used for electric vehicles. Their primary purpose is transport but they produce fewer emissions when used, also the energy source used to produce the electricity also impacts the emissions footprint.

97. The use of trains, electric or diesel, can also be considered a mitigation action since there are fewer emissions than if the freight or people were moved by fossil fuel powered trucks and automobiles.

98. But it does not really make sense to include all public transport, and passenger and freight trains as climate change expenditures. Some boundaries on their inclusion are needed. Perhaps the electric vehicles need to be multiplied by the portion of the electricity that is generated from non-carbon emitting sources. Otherwise the climate change expenditures will only reflect the public transportation and rail transportation since these expenditures will be substantially larger than other categories of expenditures.

4 Other considerations in advancing the issue

99. Currently there is no compilation guide for SEEA-based, full economy climate change mitigation or climate change adaptation expenditures. This points to relatively untested methodologies.

100. Eurostat is working on establishing investment variables for climate change mitigation. This reporting is based on the re-use of established reporting of environmental expenditure accounts. Data in various categories and variables are basically re-organized into a new classification of climate change mitigation. This reporting is only in its first year and there appears to be a number of challenges for countries.

101. The IMF, in the context of the Data Gaps Initiative 3, Recommendation 7, has developed a new reporting framework with new classifications for mitigation and adaptation expenditures. There are no compilation guidelines but there is a list of products to be included. These products, however, are not from any standard list of products such as CPC, NAPSC, Prodcom, etc.

102. How to include CC-expenditures in the revised SEEA-CF is an important consideration. There is a great demand for these types of statistics, a number of different approaches and systems are being developed outside of the statistical system – so there is an urgency for the SEEA-CF to include SEEA-based Climate Change Expenditure Accounts.

103. It may be possible to include some basic framework principles, include the CC-mitigation expenditures that make sense, and then to propose CC-adaptation expenditures be considered more experimental, if it is considered that these accounts do not appear ready for full inclusion in the revised SEEA-CF.

5 References – to be developed more

Eurostat's work on climate change mitigation investment (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Investments_in_climate_change_mitigation

Eurostat funded project for expenditures on circular economy, climate change mitigation and adaptation, https://circabc.europa.eu/ui/group/b01d2930-990e-44fb-9121-a9a6b00a1283/library/5d95ee90-ff2b-447f-9c55-1d8469922273?p=1&n=10&sort=modified_DESC

IMF's G20 Data Gaps Initiative (DGI III.7 https://www.imf.org/en/News/Seminars/Conferences/DGI/g20-dgi-recommendations#rec3-7

OECD, Development Finance for climate and environment. http://oe.cd/RioMarkers

UNESCAP-UNDRR's Disaster-Related Statistics Framework (DRSF) including Disaster Risk Reduction Expenditure and Transfers (DRRE Tables) (see p. 64, and p. 112-113 Tables DRRE_A & DRRE_B of the DRSF manual, https://stat-confluence.escap.un.org/download/attachments/16155350/DRSF%20Manual_20220411.pdf?version=1&modificationDate=1649660412114&api=v2)

The UNECE's Recommendations on the Role of Official Statistics in Measuring Hazardous Events and Disasters