



# TECHNICAL ASSISTANCE REPORT

## PERU

Report of the Diagnostic Mission on Macro-  
relevant Climate Change Statistics  
(July 10–14, 2023)

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## Acronyms and Abbreviations

ANA	National Water Authority
BCRP	Central Reserve Bank of Peru
BNE	National Energy Balance
CEPLAN	National Center for Strategic Planning
CNCC	National Commission on Climate Change
IMARPE	Peruvian Institute of the Sea
INEI	National Statistical Institute
MEF	Ministry of Economy and Finance
MIDAGRI	Ministry of Agrarian Development and Irrigation
MINAM	Ministry of Environment
MINEM	Ministry of Energy and Mines
MINSA	Ministry of Health
NDCs	Nationally Determined Contributions
PRODUCE	Ministry of Production
SERFOR	National Forest and Wildlife Service
SENAMHI	National Service of Meteorology and Hydrology
SIMON	System for Monitoring Adaptation and Mitigation Measures

# Summary of Mission Outcomes and Priority Recommendations

- 1. A diagnostic mission was conducted during July 10–14, 2023, to develop a roadmap to guide the compilation of climate statistics for Peru to address policy needs for data.** The mission was conducted under the auspices of the Swiss State Secretariat for Economic Affairs (SECO) funded Environment and Climate Change Statistics Capacity Development Program, a two-year project with the objective to assist countries in developing timely and internationally comparable statistics to support the design and monitoring of policies to address the environmental, financial, economic, and social implications associated with climate change.
- 2. Discussions were conducted during plenary and bilateral sessions with key national stakeholders representing data compilers and users to take stock of work already undertaken on climate change related statistics for Peru, ongoing capacity development initiatives with other agencies, policy needs, data availability and data gaps.** Participating agencies included the National Statistical Office (INEI), Ministry of Environment (MINAM), Ministry of Energy and Mines (MINEM), Ministry of Agrarian Development and Irrigation (MIDAGRI), National Service of Meteorology and Hydrology (SENAMHI), Central Bank of Peru (BCRP), Ministry of Economy and Finance (MEF), National Center for Strategic Planning (CEPLAN), Ministry of Production (PRODUCE), and the Sea Institute of Peru (IMARPE).
- 3. Peru has made significant commitments to climate change through the Law N°30754.** The law stipulates the development of a national plan to fight climate change. The law also establishes the creation of The National Commission on Climate Change (CNCC) which coordinates the work of public and private institutions on Climate Change. Among the duties of the committee, it is the coordination of “production” of data and statistics to monitor, including the generation of technical information to guide, the implementation of the Nationally Determined Contributions. The national plans are used as an overarching framework to develop regional and local strategies. In 2020, Peru increased its mitigation goal from 30 percent to 40 percent against the BAU scenario in 2030 and indicated an absolute target number in terms of the amount of CO<sub>2</sub> equivalent (not exceeding 179 MtCO<sub>2</sub>e by 2030).<sup>1</sup> Overall, Peru is in a good position to enhance the suit of environmental statistics by taking advantage of available resources.
- 4. Among the main priorities identified by the mission and discussed with the authorities, the most feasible enhancements include an increased detail (and timeliness) of the energy accounts, of the air emission accounts - including the change of land use accounts -, and the domestic carbon footprints.** There was broad agreement on the need to enhance the coordination among data producing agencies and their data sharing arrangements with the objective to facilitate the enhancement of environmental/climate-related statistics. Improved data sharing mechanisms and a centralized hub for climate/environmental related statistics not only will improve the timelines and reduce the collection cost, but will greatly support the development, use, and sharing of these data and statistics.
- 5. Secondary priorities include the compilation of mineral and energy asset accounts, the environmental activity accounts including government environmental expenditures.** For most of

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<sup>1</sup> <https://unfccc.int/sites/default/files/NDC/2022-06/Reporte%20de%20Actualizacio%CC%81n%20de%20las%20NDC%20del%20Peru%CC%81.pdf>.

these statistics, raw data sources are available but additional work may be needed to organize it by the appropriate classifications and definitions. MINAM expressed strong interest in developing physical and transition risk indicators.

**6. To support progress in the development of macro-relevant climate change statistics, the mission made the following priority recommendations:**

**TABLE 1.** Priority Recommendations and Responsible Institutions

Target Date	Priority Recommendation	Responsible Institutions
<b>December 2024</b>	<i>Develop SEEA Energy Flow Accounts based on Peru's Energy Balances</i>	INEI – MINEM
<b>December 2024</b>	<i>Develop the Air Emission Flow Accounts - including the change of land use accounts</i>	INEI – MINAM – MIDAGRI
<b>December 2024</b>	<i>Develop Domestic Carbon Footprints</i>	MINAM – INEI

**TABLE 2.** Priority Recommendations, Actions and Milestones

Priority	Action/Milestone	Target Completion Date
<b>Outcome: New Climate Change Statistics are Compiled</b>		
<b>Energy Accounts</b>	Publish 2019 Accounts	December 2024
<b>Air Emissions Accounts</b>	Publish 2019 Accounts	December 2024
<b>Other deliverables</b>	Take stock of progress and decide on next priorities	June 2024

Further details on the priority recommendations and the related actions/milestones can be found in the action plan under Detailed Technical Assessment and Recommendations.

# Detailed Technical Assessment and Recommendations

## A. INTRODUCTION AND OBJECTIVES OF THE PROJECT

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7. Under the auspices of the Swiss State Secretariat for Economic Affairs (SECO) funded Environment and Climate Change Statistics Capacity Development Program, a diagnostic mission was conducted in Peru during July 10–14, 2023, to develop a workplan for enhancing the environmental and climate change statistics necessary for policy making. The diagnostic mission is part of a two-year multi-country project, which will also include trainings and targeted hands-on technical assistance to support development and mainstreaming of macro-relevant environmental and climate change indicators to inform policy and monitor the impact of their climate change mitigation and adaptation measures.

8. The main objective of the project is to support Peru in designing and implementing a macro-relevant climate change statistics program to address its climate change mitigation and adaptation policy data needs. The project will build on IMF's existing capacity development efforts in the areas of macroeconomic statistics and seek to provide Peru with the tools, resources, and technical capacity to develop a range of environmental and climate change statistics that can inform financial and macroeconomic policies. The project will also build on other initiatives that are currently taking place in Peru.

9. The mission met with key national stakeholders, with data producers and users, to identify policy priorities and related climate change and environmental statistics data needs. The mission, hosted by INEI, took stock of the main existing climate change and environmental statistics for Peru and ongoing capacity development initiatives with other international organizations. The mission met with officials from the National Statistical Office, Ministry of Environment, Ministry of Energy and Mines, Ministry of Agrarian Development and Irrigation, National Service of Meteorology and Hydrology, Central Reserve Bank of Peru, Ministry of Economy and Finance, National Center for Strategic Planning, Ministry of Production, and Peruvian Institute of the Sea. The mission also met with the SECO representative in Peru, Mrs. Jenny Valencia Yañes de Cárcamo.

## B. PERU'S CLIMATE CHANGE RELATED POLICY PRIORITIES AND INTERNATIONAL COMMITMENTS

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10. The Government of Peru has made significant commitments to climate change, which were consolidated through the Law N° 30754 published on April 2, 2018. This law set the Peruvian legislation framework on climate change by stipulating the development of a national plan to fight climate change. The law also establishes the creation of The National Commission on Climate Change<sup>2</sup> (CNCC) which coordinates the work of public and private institutions on climate change. Among the duties of the committee, it is the coordination of “production” of data and statistics to monitor, including the generation of information to guide, the implementation of the Nationally Determined Contributions (NDCs). The CNCC develops national plans that are used as an overarching framework to develop regional and local

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<sup>2</sup> Climate action plan (Paris Agreement) to cut emissions and adapt to climate impacts. Countries set targets for mitigating the greenhouse gas emissions that cause climate change and for adapting to climate impacts, define how to reach the targets, and elaborate systems to monitor and verify progress.

strategies. Peru is in the process to develop its National Strategy for Climate Change by 2050 (ENCC 2050),<sup>3</sup> it has already produced the National Plan for Adaptation to Climate Change of Peru,<sup>4</sup> the Catalog of Mitigation Measures,<sup>5</sup> and the Catalog Adaptation Measures.<sup>6</sup> Overall, Peru is in a good position to enhance the suit of environmental statistics by taking advantage of available resources.

**11. Under the Paris Agreement, Peru has set adaptation and mitigation measures.** To monitor the adaptation and mitigation measures associated with the Peruvian NDCs, the MINAM has set the System for Monitoring Adaptation and Mitigation Measures (SIMON). The goal of the eighty-four adaptation measures is to contribute to reducing the current and future damages, alterations, and losses to populations and their livelihoods; basins, ecosystems, territories; infrastructure and goods and services, taking advantage of resilient development opportunities. the goal of the sixty-five mitigation measures is to help reducing the greenhouse gas emissions by 40 percent by 2030, which means reaching a maximum level of emissions of 179 MtCO<sub>2</sub>eq. In order to achieve this reduction, emissions must be reduced in five sectors – energy, waste, industrial process, agriculture, and land use change. The System for Monitoring Adaptation and Mitigation (SIMON) has also a third component, associated with monitoring the possible sources of financing which can be uses to help in the implementation of the necessary mitigation and adaptation policies.

## C. RELEVANT ENVIRONMENTAL AND CLIMATE CHANGE STAKEHOLDERS, INITIATIVES AND STATISTICS

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**12. Environmental and climate matters concern entities across several sectors and while clear coordination efforts in policy planning are in place, there is space to enhance the overall management of responsibilities on data production and dissemination.** The compilation and dissemination of different aspects of environment and climate change statistics are spread-out among different government agencies; some of the formats at which the data are made available are not user friendly, and some sources are seriously outdated. The following paragraphs describe some of main data-producing agencies and the main climate/environmental statistics produced.

**13. INEI is the governing agency of the national statistics and information systems in Peru.** It is mandated to ensure that the statistical activities carried out by government entities are implemented in an integrated, coordinated, rationalized manner, and under common technical regulations. On the data collection and primary sources, INEI conducts economic, social, and environmental censuses and surveys, and works in collaboration with ministries, government agencies, regional and local governments. INEI also compiles economic, population, households, employment, social, and environmental statistics.

**14. The national accounts in Peru are compiled and disseminated by INEI, as well as various environmental indicators and statistics.** Annual and quarterly GDP are published regularly. The

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<sup>3</sup> <https://www.gob.pe/institucion/minam/campa%C3%B1as/3453-estrategia-nacional-ante-el-cambio-climatico-al-2050>.

<sup>4</sup>

[https://cdn.www.gob.pe/uploads/document/file/2827898/220214\\_Resumen%20Ejecutivo%20del%20Plan%20Nacional%20de%20Adaptaci%C3%B3n\\_compressed.pdf.pdf?v=1664915422](https://cdn.www.gob.pe/uploads/document/file/2827898/220214_Resumen%20Ejecutivo%20del%20Plan%20Nacional%20de%20Adaptaci%C3%B3n_compressed.pdf.pdf?v=1664915422).

<sup>5</sup> <https://sinia.minam.gob.pe/documentos/catalogo-medidas-mitigacion>.

<sup>6</sup>

[https://cdn.www.gob.pe/uploads/document/file/571780/230726\\_Cat%C3%A1logo%20de%20Adaptaci%C3%B3n%202023.pdf?v=1690408888](https://cdn.www.gob.pe/uploads/document/file/571780/230726_Cat%C3%A1logo%20de%20Adaptaci%C3%B3n%202023.pdf?v=1690408888).



current base year is 2007 and work is underway to change it to 2019. Detailed SUTs are produced and released on an annual basis (available for the years 2007 through 2021) at the level of 101 industries and 365 products. With regards to environmental statistics,<sup>7</sup> INEI produces the *Yearbook of Environmental Statistics*, a monthly *Technical Bulletin on Environmental Statistics*, and two reports according to the SEEA central framework, the *Forest Accounts* of Peru –in collaboration with National Forest and Wildlife Service (SERFOR)-, and the *Water Environmental and Economic Accounts* –in collaboration with National Water Authority (ANA). It is also responsible for the compilation of the United Nations - Sustainable Development Goals indicators.

**TABLE 3.** Selected Publications

Publication	Institution(s)	Released	Latest data
<a href="#"><u>Yearbook of Environmental Statistics</u></a>	INEI	2022	2021
<a href="#"><u>Technical Bulletin on Environmental Statistics</u></a>	INEI	July 2023	June 2023
<a href="#"><u>Forest Accounts</u></a>	INEI - SERFOR	2021	2019
<a href="#"><u>Water Environmental and Economic Accounts</u></a>	INEI - ANA	2020	2018
<a href="#"><u>Environmental protection expenditures report: 2014-2018</u></a>	MINAM	2021	2018
<a href="#"><u>National Energy Balance</u></a>	MINEM	2023	2021
<a href="#"><u>National Inventory of Greenhouse Gases</u></a>	MINAM	2023	2019

**15. MINAM is responsible for strengthening climate institutions, implementing Perú's NDC, and the climate-related adaptation and mitigation monitoring system.** It promotes the conservation and sustainable use of natural resources, the enhancement of biological diversity and environmental quality for the benefit of people and the environment in a decentralized and articulated manner with public<sup>8</sup> and private organizations and civil society, in the framework of green growth and environmental governance. It is responsible for formulating, planning, directing, executing, supervising, and evaluating the National Environmental Policy,<sup>9</sup> applicable to all levels of government. In addition, MINAM promotes initiatives that: (a) contribute to the adaptation and mitigation of climate change, (b) value natural capital,

<sup>7</sup> In the production of environmental statics INEI works regularly with other state agencies and ministries, and in particular with MINAN, SENAMHI, MINEN, MIDAGRI, PRODUCE, MEF and CEPLAN.

<sup>8</sup> The following public agencies are associated with MINAM: a) Geophysical Institute of Peru, b) SENAMHI; c) Research Institute of the Peruvian Amazon; d) National Institute of Research in Glaciers and Mountain Ecosystems; e) Agency for Environmental Evaluation and Control; f) National Service of Natural Areas Protected by the State; and g) National Service of Environmental Certification for Sustainable Investments.

<sup>9</sup> MINAM also directs the National Environmental Management System and the National Environmental Impact Assessment System, acting as rector of the Environmental Sector.

(c) prevent loss of forests, (d) strengthen protection and sustainable use of biological diversity, through bio-businesses and eco-businesses, and (e) work with the local population.

**16. The General Directorate of Agrarian Environmental Affairs (DGAAA), at MINAM, is the body in charge of implementing actions for the conservation and sustainable use of renewable natural resources within its jurisdiction** (within the framework of the National Environmental Management System). Among its functions, it complies with proposing plans, strategies, standards, guidelines, programs, and projects to improve the environmental management of the sector, the sustainable use of land resources for agricultural use, and the reduction of vulnerability and its adaptation to climate change. The DGAAA is constituted by the Agrarian Environmental Management Directorate and the Natural Resources Evaluation Directorate.

**17. MINEM is responsible for the formulation and evaluation of national policies regarding the sustainable development of mining-energy activities, contributing to human development while reducing the environmental impact.** It promotes the integral development of the activities inherent to the sector, regulating and supervising their compliance, safeguarding the rational use of natural resources in harmony with the environment, increasing the competitiveness and guaranteeing legal stability. In such a role, MINEM produces the National Energy Balance (BNE) and the Mining Statistical Bulletin. The BNE allows visualizing the physical flows of the different energy sources used in the country, through which energy is produced, exchanged abroad, transformed, and consumed; all calculated in a common energy unit.

**18. MEF, among its functions, is responsible for the national public budget system,** as such it set all the norms and standards for the classification and registry of the public expenditures and revenues. Public expenditures are structured following the institutional, economic, functional, programmatic, and geographical classifications; and are registered in the Integrated Financial Administration System (SIAF). Given the way the classification is currently structured, with no specific account to cover expenditures on climate change, ad-hoc work was conducted between 2014 and 2018 to extract from the SIAF information on public expenditure related to climate change mitigation, adaptation, or other climate change expenditure. The results are show in the MEF portal and can be accessed in <https://www.mef.gob.pe/es/seguimiento-de-la-ejecucion-presupuestal-consulta-amigable>. However, there is still some caveats and challenges that need to be taken into consideration:

- a. The procedure for the identification and update of the budget lines needs to be revised.
- b. There is the need to develop new functionalities for a friendly consultation on adaptation and mitigation in the face of climate change.
- c. The existing strategic planning tools need to be better aligned with budgetary classifications.
- d. There is the need to have a better articulation with the entities involved.

**19. CEPLAN is the ministry responsible for the strategic planning of Peru.** It is responsible for the Strategic Plan for National Development (PEDN) to 2050, Environment and Climate Change, Decree No. 095-2022-PCM. The PEDN is multidimensional, including national policies, territorial plans, sectoral plans, and institutional plans. The monitoring of the planning is done through the National Prospective Observatory, which is responsible to monitor the main national trends in the environmental field and on climate change, including environmental risks and opportunities. Along with MEF, CEPLAN is working on a nomenclature of budgetary classifications that is intended to capture the most relevant accounting lines related to climate change and environment.

**20. BCRP does not produce environmental or climate change statistics but is an active user of these statistics in at least three key activities:** a) projection of macroeconomic variables; b) design of monetary policy scenarios; and c) applied macro research. The main variables are related to El Niño, precipitation, temperature, humidity, and water volume stored in reservoirs. The BCRP indicated that they do not foresee any significant change with regards to future the needs or use of additional statistics given their mandate.

**21. PRODUCE is the ministry responsible to formulate, design, execute and supervise the national and sectoral policy of fishing, aquaculture, small and medium-sized enterprises, and Industry.** It exercises competence in the fishing and aquaculture regulation, industrial fishing, aquaculture of medium and large companies, defining industrial standards, as well as determining controlled products, fostering productive innovation, and technology transfer. Its mission is to promote the development of the productive sector by innovation, quality, and environmental sustainability, and so contributing to the competitiveness of the sector.

**22. Moreover, PRODUCE plays a central role in promoting efficient production and the circular economy.** In direct relation to climate change mitigation policies, the government Decree N.º345-2018-EF –within the National Competitiveness and Productivity Policy- includes the Policy Measure 9.3 on Circular economy and Clean Production that states: “private economic agents should progressively adapt the linear production model towards a circular production model for the extraction, transformation, distribution, use and recovery of materials, energy efficiency, among others.”

**23. IMARPE is an Institute associated with PRODUCE that monitor and address the impacts of ocean acidification in the environment and ecosystems. It compiles the Sustainable Development Goals indicator 14.3.1 on sea acidity, and it has the goal of.**

**24. SENAMHI is a public agency attached to the Ministry of the Environment responsible to provide climate related information and guidelines on historical trends, extreme events, and projections of national and regional climate scenarios.** It began as a Decentralized Public Organization of the Defense Sector created by D.L.Nº 17532 of March 25, 1969, regulated by Law No. 24031 of December 14, 1984, its amendment approved by Law No. 27188 of October 25, 1999. The Regulation of its Law established with D.S.Nº 005-85-AE of July 26, 1985. With the aim of disseminating reliable and quality information, SENAMHI operates, controls, organizes and maintains the National Network of more than 900 Meteorological and Hydrological Stations in accordance with the technical standards of the World Meteorological Organization (WMO). As such it provides information and forecasts on temperature, precipitation, hydrology, atmospheric environment, and agrometeorology.

**25. MIDAGRI is the governing public body in agrarian matters in accordance with the National Agrarian Policy.** This policy defines the medium and long-term guidelines in favor of the sustainable development of agriculture, with the aim of activating development and social inclusion for the benefit of the rural population. In addition, it contributes to food and nutritional security in Peru and promotes the sustainable use of water, forest, and wildlife resources.

#### **Coordination among Data Producers**

**26. The breadth of environmental policies and initiatives requires strong and sustained coordination.** The National Commission on Climate Change (CNCC) has the role to coordinate the work of public and private institutions working on climate change. The institutions usually work independently and would benefit from better coordination for producing environmental and climate change statistics.

**27. While the production of climate and environmental statistics is somehow abundant, it is spread out among several institutions, with different formats, and not aligned to a common production infrastructure.** The interrelation and data dependencies among source data and statistics can be better organized to maximize the use of the compilation efforts and reach of these statistics, and to avoid potential duplications. A well-defined coordination mechanism would help on the exchange of confidential data, production of more timely statistics, eliminate duplication of work, and could set the basis for a platform on environmental and climate change statistics. This would allow to share information among national agencies and disseminate them to the users including the general public, international organizations, academics, research institutes, private firms, and so on. The mission also considers that INEI and/or MINAM could take a leading role as the institutions consolidating and maintaining a single hub where all environmental and climate related data are integrated and disseminated.

#### **Support from International Organizations**

**28. The UN is supporting activities on the implementation of environment statistics and climate change indicators.** In December 2002, the UN provided a National Workshop on Environmental Statistics and Climate Change in Peru, with the participation of more than 20 Peruvian Institutions. It is important that STA leverages on these efforts so as to avoid duplication and work towards common objectives.

**29. The World Bank (WB) did in 2022 a Country Climate and Development Report on Peru.** The mission made attempts to contact the WB's experts prior the mission without success. But it was able to contact them after the mission and will be coordinating future activities with them.

#### **D. ACTIVITIES IN SELECTED AREAS AND OUTPUTS**

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**30. The mission discussed with the authorities, both during bilateral meetings and the workshop, priority environmental and climate change statistics to be developed during the SECO program.** Various institutions presented the availability of such statistics in Peru and provided general suggestions how to address data gaps. The mission expanded mostly on the selected DGI 3 recommendations.

#### **Energy Flow Accounts**

**31. PERU has no energy flow accounts; however, it has energy balances which can be uses as the basis for a basic SEEA-consistent energy flow account at the national level.** The energy balances, on the consumption side covers seven industries (Fishing, Agriculture, Mining, Manufacture, Transport, Services, Public Services) and provides supply and use data for seven energy commodity groupings.<sup>10</sup> The results are presented in a PDF report only; no downloadable database of the data is provided. The latest publication, in July 2023, refers to the year 2021,<sup>11</sup> and there is information for the energy balances back to 1965. The energy balances also present emissions estimations for carbon (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O).

**32. Considerable scope exists for improving the energy flow account.** The Energy Balances could be significantly enhanced, by having greater breakdown of the industrial sector and being more aligned with the classification of the IEA Energy Balances, and thus better support the estimation of the

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<sup>10</sup> Mineral coal, biofuels, crude oil, natural gas, hydropower, solar energy, and wind energy.

<sup>11</sup> <https://www.minem.gob.pe/publicacion.php?idSector=12&idPublicacion=664>.

SEEA-Energy accounts by providing a greater level of detail and granularity for energy industries, energy products, final consumption items, and in a timelier manner.

**33. The mission recommended INEI and MINEM as leading institutions in the estimation of the Energy Flow Accounts.** INEI can develop and implement the methodologies to convert the energy balances into the accounts, while MINEM can focus their efforts in improving the detail, timeliness, and frequency of the collection of energy statistics that will result in more disaggregated energy balanced and energy accounts.

#### **Air Emissions Accounts**

**34. There was agreement on the need to develop a comprehensive set of SEEA-Air Emissions Accounts (AEA), including land use change, as a priority.** Information for the AEA for Peru can be drawn from information available from the NDCs emissions estimation, and the national inventories of greenhouse gases (both from MINAM), the energy balances (MINEM) and agriculture emission data (MIDAGRI). To obtain the AEA, it is recommended to first develop the SEEA-Energy Accounts which will be used as a key input for the SEEA-AEA. Giving that the latest information available for the NDCs emissions estimation refers to 2019, this year will be used as the reference year for the estimation of these accounts.

**35. It is recommended that INEI - MINEM - MIDAGRI - MINAM work jointly in developing a strategy to gather all the data required for the estimation of the AEA.** As in the case of the energy accounts, it may be more efficient to have INEI to lead the methodological implementation and subsequent estimation in line with the SEEA. In addition to collecting all the required data it would be important to agree on a data sharing protocol where all the data providers can commit to providing the data in specific dates, so that the dissemination the accounts can follow a predefined calendar as well.

#### **Carbon Footprints**

**36. The compilation of Air Emissions Accounts and updated IOTs will facilitate the compilation of carbon footprints.** Considering that INEI compiles and disseminates supply and use tables on an annual basis, and provided that AEA are developed, Peru would be in a good position to start the compilation of national carbon footprints. However, a broad measure of emissions includes both direct and indirect emissions by resident establishments because of economic (production, consumption, and accumulation) processes. Carbon footprints are broken down by output industry and contributing industries as well as by demand category. The data are generally presented as annual estimates.

**37. Carbon footprints have various policy uses including identification of high versus low emitting industries and the identification of the consumption of products that result in high levels of emissions.** They also facilitate the assessment of individual corporate scope one, scope two and scope three emissions relative to the industry average. The main source data required to produce national carbon footprints include a) Input-output tables,<sup>12</sup> b) Direct measures of emissions, and c) Air Emissions Accounts.

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<sup>12</sup> Input-Output Tables can be derived from Supply and Use Tables.

**38. National Carbon Footprint,** it may be strategic to put MINAM and INEI as estimation institutions and the lead can be taken by MINAM, considering that the MINAM has made progress on this issue, and we would support whoever corresponds.

#### Mineral and Energy Asset Accounts

**39. There was a broad agreement on the importance of developing Mineral and Energy Asset Accounts.** The anticipated energy transition is expected to have significant repercussions for the use of natural resources and therefore, their changes in value over time which will impact public and private income which rely heavily on natural resources. In the Peru context, the economic value of deposits of oil and gas are expected to diminish over time and gradually be substituted by renewable energy sources. On the other hand, Peruvian deposits of Copper and Lithium have significant value for the energy transition.

**40. A potential outcome of energy transition is a redistribution of natural resource wealth which may have implications for the revenue generating capacity of government.** Mineral and Energy Asset Accounts present physical and monetary values of natural resource wealth and changes therein (extraction, holding gains and losses, depletion of natural resources). The methodology to account for these resources is well developed in both the *System of Environmental-Economic Accounting* and the *System of National Accounts 2008*. Mineral accounts can be developed using national accounts and ideally SUTs data which provide detailed activity estimates for production, value added, contribution to GDP. They can also be used to better understand the generation of income from natural resources with a breakdown of primary income components between compensation of employees and operating surplus.

#### Environmental Activity Accounts

**41. Environmental activity expenditures are those expenditures whose primary purpose is to reduce or eliminate pressures on the environment or to make more efficient use of natural resources.** These accounts can inform on the contribution of environmental activities on the economy by identifying these activities related to the environment. Estimates of environmental activity expenditures (both public and private) can be used to understand the level of resources required to develop policies to mitigate the economic risk associated with climate change. Environmental expenditures can be broken down into two main categories: Environmental Protection Activities and Resource Management Activities. Most of these environmental transactions are recorded within the core national accounts framework but many cannot be easily identified owing to the structure of the accounts or the types of classifications that are used.

**42. Technical assistance in this area would focus on working with countries to incorporate additional breakdowns into their existing national accounts statistics (e.g., supply and use tables)** and re-aggregating the estimates of output, intermediate consumption and value added to produce accounts like environmental protection expenditure accounts, resource management expenditure accounts and environmental goods and services accounts.

#### Environmental Government Revenues by Type

**43. There is potential for compiling environmental government revenues by type.** Governments obtain revenues through the management and protection of natural resources and levying of environmental taxes. These revenues are likely to be impacted when economies transition away from fossil fuel-based energy supplies. On the other hand, substantial reserves of Lithium will positively impact GDP and therefore government revenues from growing economic activities. These data will help monitoring the change in government revenue streams as governments adopt climate mitigation and



adaptation policies. Environmental revenues by type are outlined in the *Government Finance Statistics Manual 2014*, the *System of National Accounts 2008* and the *System of Economic and Environmental Accounting*. So far, Peru is not compiling environmental revenues.

#### Forward Looking Physical and Transition Risk Indicators

**44. Participants in the plenary sessions also prioritized an assessment of the potential to develop Forward Looking indicators of Physical and Transition Risk Indicators which quantify the potential impact that climate hazards can have on physical structures and populations as well as the impact climate mitigation strategies can have on business income and financial markets.** While the methodological guidance on physical and transition risk indicators is still being developed significant progress has been made over the last number of years (e.g., models developed by the Network for the Greening of Financial System (NGFS)), to standardize the models and pathways that support the compilation of these indicators.

**45. Indicators will focus on the potential for developing estimates of the potential loss (measured in terms of income, asset values, and populations) arising from climate hazards like rising storms, drought conditions or flooding caused by rising sea levels and those arising from climate mitigation policies such as carbon pricing.** Work in this area could be envisaged as a data stewardship component using statistics readily available from international databases. Some examples are provided in the annex. The compilation of carbon footprint would also support the preparation of a carbon pricing model to assess the impact of a carbon tax on inflation for example.

### E. CONCLUSIONS AND RECOMMENDATIONS

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**46. There was agreement on the need to develop the energy accounts and the air emissions accounts—including from the change of land use—domestic carbon footprints, and government environmental expenditures.** Peru currently compiles energy balances (2021) and greenhouse gas emissions inventory (2019), which are the main data sources for the proposed accounts. Improvement in the data sharing protocols will improve the timeliness of these statistics. Additional detailed classifications and definitions are required for an accurate allocation of the government expenditures to climate-related initiatives. The Ministry of Economy and Finance is currently working on a new IT system that will include an additional layer of classifications to account for climate-related activities.

**47. Secondary priorities including environmental activity accounts, as well as mineral and energy asset accounts, were identified.** Some of the data sources for these accounts are available but capacity needs to be built and some definitions and classification agreed upon to start compiling these indicators. These accounts are still high priorities, but their implementation may take longer. In addition, MINAM showed strong interest in developing forward looking physical and transition risk Indicators, and the mission indicated that the methodological developments for indicators are in progress and if MINAM staff would like to participate in the discussion, the mission would liaise them with the task team working on this.

**48. While inter-agency collaboration appears sound, significant improvements could be made by facilitating data sharing and hosting.** Significant amounts of environmental and climate data are available, from multiple sources and in multiple formats (including pdf). The country would benefit from the creation of a single data hub where all the data are made available in a timely manner and in usable formats, and where one of the institutions plays the data stewardship role (e.g., MINAM or INEI).

49. To support progress in the development of macro-relevant climate change statistics, the mission made the following priority recommendations:

**TABLE 4.** Priority Recommendations and Responsible Institutions

Target Date	Priority Recommendation	Responsible Institutions
December 2024	<i>Develop SEEA Energy Flow Accounts based on Peru's Energy Balances</i>	INEI – MINEM
December 2024	<i>Develop the Air Emission Flow Accounts - including the change of land use accounts</i>	INEI – MINAM – MIDAGRI
December 2024	<i>Develop Domestic Carbon Footprints</i>	MINAM – INEI

**TABLE 5.** Priority Recommendations, Actions and Milestones

Priority	Action/Milestone	Target Completion Date
<b>Outcome: New Climate Change Statistics are Compiled</b>		
<b>Energy Accounts</b>	Publish 2019 Accounts	December 2024
<b>Air Emissions Accounts</b>	Publish 2019 Accounts	December 2024
<b>Other deliverables</b>	Take stock of progress and decide on next priorities	June 2024



# Appendices

## APPENDIX A. LIST OF ENVIRONMENTAL STATISTICS AND ENVIRONMENTAL ACCOUNTS

Publications & Websites	Description	Frequency of Publication
<b><u>INFOCARBONO</u></b>	MINAN - Website - National greenhouse gas emissions	
<b><u>Carbon Footprint Peru</u></b>	MINAN - Website - Greenhouse gas emissions from public and private organizations, at the firm level, self-declared	
<b><u>UKUKUI</u></b>	MINAN - Website - Deforested area in the Peruvian Amazon	Being implemented
<b><u>Environmental Statistics Yearbook</u></b>	INEI - Consolidates the main environmental statistics available in Peru	Annual
<b><u>Monthly Report Environmental Statistics</u></b>	INEI - Consolidates the main environmental statistics available in Peru	Monthly
<b><u>Forest account of Peru</u></b>	INEI - Refers to 2019	2021
<b><u>Environmental and economic accounts of water in Peru</u></b>	ANA - Refers to 2018	2020
<b><u>Environmental Protection Expenditure Report</u></b>	MINAM - Refers to 2014-2018	2021
<b><u>Government Expenditure on Climate Change Adaptation and Mitigation</u></b>	MEF – Website	
<b><u>National Prospective Observatory</u></b>	CEPLAN – Website	
<b><u>Showcase of Knowledge in Climate and Health</u></b>	MINSA – Website	
<b><u>TENDHIS</u></b>	SENAMHI – Website - Precipitation and temperature	
<b><u>PHISIS</u></b>	SENAMHI – Website - Hydrological Platform	
<b><u>SONICS</u></b>	SENAMHI – Website - Potential Flood Observation System	
<b><u>SILVIA</u></b>	SENAMHI – Website - Monitoring System for Potential Mass Movements generated by Heavy Rains	
<b><u>IDESEP</u></b>	SENAMHI – Website on Spatial Data Infrastructure	
<b><u>Energy Balances</u></b>	MINEN – Website - PDF	
<b><u>Mining Statistical Bulletin</u></b>	MINEN – Website - PDF	
<b><u>Satellite Tools for Territorial Analysis and Impact Monitoring</u></b>	MIDAGRI – Website	

**FIGURE 1.** Peruvian Statistics and Environmental Accounts

COMPONENTS					
1	2	3	4	5	6
CONDITIONS AND ENVIRONMENTAL QUALITY	ENVIRONMENTAL RESOURCES	WASTES	NATURAL AND ANTHROPIC EVENTS AND DISASTERS	HUMAN HABITAT AND ENVIRONMENTAL HEALTH	PROTECTION, MANAGEMENT, ENVIRONMENTAL AWARENESS
SOURCE INSTITUTIONS					
<p><b>1.1 Physical Conditions</b> (atmosphere, climate and meteorological conditions; hydrographic characteristics; soil characteristics)</p> <p><b>1.2 Land Cover, Ecosystems and Biodiversity</b></p> <p><b>1.3 Environmental Quality</b> (air quality and fresh and marine water quality)</p>	<p><b>2.1 Mineral resources</b></p> <p><b>2.2 Energy Resources</b></p> <p><b>2.3 Land</b></p> <p><b>2.4 Biological Resources</b></p> <p><b>2.5 Water Resources</b></p>	<p><b>3.1 Air emissions</b></p> <p><b>3.2 Generation and management of wastewater</b></p> <p><b>3.3 Waste generation and Management</b></p> <p><b>3.4 Chemical Release</b></p>	<p><b>4.1 Occurrence of natural and anthropic events</b></p>	<p><b>5.1 Human hábitat</b></p> <p><b>5.2 Environmental health</b></p>	<p><b>6.1 Protection and expenses in management of environmental resources</b></p> <p><b>6.2 Governance and environmental regulation</b></p> <p><b>6.3 Preparedness for extreme events and disaster management</b></p> <p><b>6.4 Information and environmental awareness</b></p>

Source: INEI.

**FIGURE 2.** Peruvian Institutions as Sources of Statistics and Environmental Accounts

COMPONENTS					
1	2	3	4	5	6
CONDITIONS AND ENVIRONMENTAL QUALITY	ENVIRONMENTAL RESOURCES	WASTES	NATURAL AND ANTHROPIC EVENTS AND DISASTERS	HUMAN HABITAT AND ENVIRONMENTAL HEALTH	PROTECTION, MANAGEMENT, ENVIRONMENTAL AWARENESS
SOURCE INSTITUTIONS					

Source: INEI.

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