

National Statistics Bureau
Royal Government of Bhutan

National Implementation Plan for the System of Environmental-Economic Accounting in Bhutan

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Foreward

Bhutan's remarkable journey towards sustainable development has long been guided by the principle that the well-being of its people is intricately woven into the preservation of its pristine environment. Our nation's commitment to Gross National Happiness (GNH) has garnered global acclaim as a holistic development philosophy that places the welfare of our citizens and the stewardship of our environment at the forefront of our policy priorities.

In harmony, with this profound commitment, Bhutan, like many forward-thinking nations, has officially embraced the System of Environmental-Economic Accounting (SEEA) as our national accounting framework for the environment. The SEEA, celebrated as the international statistical standard for national capital accounting, empowers nations to transcend the conventional Gross Domestic Product (GDP) metric and embark on a deeper exploration of how our environment contributes to and shapes our economic destiny.

While our initial SEEA accounts have focused on the domains of Energy and Minerals, it gives me greater pleasure to announce that the National Statistics Bureau (NSB), in collaboration with the United Nations Statistics Division has diligently worked over the past six months to craft the *National Implementation Plan for the SEEA in Bhutan*. This plan not only seeks to enhance the existing accounts but also aspires to encompass a broader array of sectors over the short, medium, and long-term horizons, coinciding with the 13 Five Year Plan periods.

The Implementation Plan signifies a momentous stride in Bhutan's ongoing journey towards sustainable development. It reiterates our unwavering dedication to the advancement of environmental sustainability, the safeguarding of our precious natural heritage, and the promotion of our citizens' well being.

The NSB endowed with the responsibility to implement the SEEA and cultivate the necessary data and resources, assumes a pivotal role in this transformative endeavor. As we embark on this significant path towards SEEA implementation, we acknowledge the challenges that lie ahead. However, we are steadfast in our belief that, with collective effort and determination of all stakeholders, we can overcome these challenges.

In conclusion, the *National Implementation Plan for the SEEA in Bhutan* stands as a testament to Bhutan's steadfast adherence to the principles of GNH and our profound understanding of the intrinsic value of the environment to our nation's prosperity. It also underscores our commitment to upholding the resolutions of various multilateral environmental conventions.



(Karma Tshering)

Secretary

Ministry of Energy and Natural Resources

Executive Summary

The Royal Government of Bhutan (RGoB) has adopted the System of Environmental-Economic Accounting (SEEA) as the official national accounting framework to measure the environment and its relationship to the economy in 2012. The SEEA is the international statistical standard for natural capital accounting and provides a way for countries to go 'beyond GDP' by better understanding how their environment contributes to and impacts the economy. The National Statistics Bureau (NSB) has the mandate to implement the SEEA and to develop the necessary data and resources to support its implementation. The NSB is responsible for ensuring that the SEEA accounts of Bhutan are relevant and of high quality.

The main objective of this plan is to develop strategies and a roadmap for the compilation and use of the accounts, based on Bhutan's sustainable development policy priorities. The plan starts from the policy questions and environmental data needs of Bhutan, both within an international and national context, which form the basis for the demand for SEEA accounts in Bhutan. From an international perspective, the 2030 Agenda for Sustainable Development and various multilateral environmental agreements (e.g., the Kunming-Montreal Global Biodiversity Framework) outline a clear need for SEEA accounts to meet reporting obligations. From a national perspective, the Gross National Happiness (GNH) framework, Bhutan's Five-year Plans (FYPs) and specific environmental acts/legislation also outline a need for integrated data on the economy, environment, and society.

The plan acknowledges that while compilation of the SEEA is within the mandate of the NSB, implementation of the SEEA is an inter-institutional exercise, with data suppliers and accounts users from different ministries being vital stakeholders. Thus, the plan recommends the creation of a national steering committee to provide strategic guidance to the implementation process, as well as to help address cross-cutting issues, such as data sharing. In addition, the plan recommends the formation of a technical group on SEEA compilation to oversee the compilation of the accounts from a technical standpoint.

As part of the creation of this plan, a thorough assessment of existing environmental data that could feed into SEEA accounts was conducted. Through an analysis of the specific data needs of policy priorities and existing data supply, the plan makes a recommendation to pursue the below SEEA accounts in a stepwise approach, according to short, medium and long-term horizons:

Short-term (2024-2025), immediate in the next two years.

- ✓ Mineral accounts
- ✓ Energy accounts
- ✓ Timber and Forest accounts
- ✓ Land cover accounts
- ✓ Air emission accounts

Medium-term (2026-2028), next two - five years.

- ✓ Water accounts
- ✓ Biological resource accounts

Long-term (2029-2032), next five - eight years.

- ✓ Solid Waste accounts
- ✓ Soil accounts

Finally, the plan recommends strengthened capacity building efforts for both data producers and data users. These capacity building efforts should focus equally on building technical capacity to compile the accounts as well as how to use the accounts for policy (i.e., application to macroeconomic analysis, use of indicators, etc.). This will help ensure long-term supply and demand for the accounts.

Acknowledgements

The National Implementation Plan for the System of Environmental-Economic Accounting in Bhutan was developed through broad consultations with relevant stakeholders. Development of the plan benefited from several bilateral consultations held in Spring/Summer 2023 with different government ministries and agencies working on the environment in Bhutan.

The National Statistics Bureau of Bhutan and the United Nations Statistics Division (UNSD) benefited from the feedback and comments received from the following institutions/ government agencies:

- ✓ Ministry of Energy and Natural Resources (MoENR)
 - Department of Energy (DoE)
 - Department of Environment and Climate Change (DoECC)
 - Department of Forest and Park Services (DoFPS)
 - Department of Geology and Mines (DoGM)
 - Department of Water (DoW)
 - National Centre for Hydrology and Meteorology (NCHM)
- ✓ Ministry of Finance (MoF)
 - Department of Planning, Budget and Performance (DPBP)
- ✓ Ministry of Agriculture and Livestock (MoAL)
 - National Biodiversity Centre (NBC)
 - National Soil Service Centre (NSSC)
- ✓ National Land Commission Secretariat (NLCS)

Appreciation also goes to the Statistical Institute for Asia and the Pacific (SIAP) of the Economic and Social Commission of Asia and the Pacific (ESCAP) for their additional comments.

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Abbreviations

AEAS	Annual Environmental Accounts Statistics
AFS	Annual Forestry Statistics
BAP	Biodiversity Action Plan
BCP	Bhutan Climate Portal/Bhutan Climate Platform
BIDIS	Business Intelligence Dashboard Integrated System
BIMS	Biodiversity Information Management System
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic
BSDS	Bhutan Statistics Database System
BUR	Biennial Update Report
DECC	Department of Environment and Climate Change
DGM	Department of Geology and Mines
DoE	Department of Energy
DoFPS	Department of Forests and Park Services
DoPH	Department of Public Health
DoT	Department of Trade
DoW	Department of Water
DPBP	Department of Planning, Budget and Performance
FNCA	Forest and Nature Conservation Act
FIRMS	Forest Information Reporting and Monitoring System
FMUs	Forest Management Units
FYP/FYPs	Five Year Plan/Plans
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GNHC	Gross National Happiness Commission
GSP	Geological Survey Plan
ICMOD	International Centre for Integrated Mountain Development
JICA	Japan International Cooperation Agency
LULC	Land Use and Land Cover
MEA/MEAs	Multilateral Environmental Agreement/Agreements
MoAL	Ministry of Agriculture and Livestock
MoENR	Ministry of Energy and Natural Resources
MoF	Ministry of Finance
MOIT	Ministry of Infrastructure and Transport
MoWHS	Ministry of Works and Human Settlement
NBSAP	National Biodiversity Strategies and Action Plans
NCHM	National Center for Hydrology and Meteorology
NDC/NDCs	Nationally Determined Contribution/Contributions
NEC/NECS	National Environment Commission/Secretariat
NEPA	National Environmental Protection Act
NLCS	National Land Commission Secretariat
NRDCL	Natural Resources Development Corporation Limited
NSB	National Statistics Bureau
RGoB	Royal Government of Bhutan
SEEA	System of Environmental Economic Accounting
SEEA CF	System of Environmental Economic Accounting - Central Framework
SEEA EA	System of Environmental Economic Accounting - Ecosystem Accounting
SNA	System of National Accounts
UNFCCC	United Nations Framework Convention on Climate Change
UNSC	United Nations Statistical Commission
UNSD	United Nations Statistics Division

1. Introduction

The importance of sustainable development is nothing new in Bhutan, where the development philosophy of Gross National Happiness (GNH) has long taken center stage. The GNH framework takes an integrated, holistic approach to development and is consistent with the 2030 Agenda for Sustainable Development. In line with the philosophy of GNH, the RGoB adopted the statistical framework, System of Environmental-Economic Accounting (SEEA) in 2012 to better inform the interactions between the economy of the country and its environment.

The SEEA is the international statistical standard for environmental-economic accounting that organizes information about the environment and ecosystems and their relationship with the economy. While the System of National Accounts (SNA) and its headline indicator, Gross Domestic Product (GDP), are useful for understanding economic growth, they are not sufficient measures for overall wellbeing and sustainability. They do not, for example, consider how the degradation of ecosystems and the depletion of natural resources affect our long-term economic growth. The SEEA aims to fill this gap; it expands the scope of statistics compiled to better inform the contribution of the environment to our well-being and how our actions impact the environment.

There are two parts of the SEEA—the SEEA Central Framework (CF) and the SEEA Ecosystem Accounting (EA). The UN Statistical Commission adopted the SEEA CF as an international statistical standard in 2012. The framework focuses on individual natural resources and covers the measurement of environmental flows, stocks of natural resources and economic activity related to the environment. The SEEA CF covers a comprehensive set of natural resources, including water, minerals, energy, timber, fish, soil, land pollution, waste, etc. Importantly, the SEEA CF applies the same accounting concepts, structures, classifications, rules and principles as the SNA, allowing environmental information to be integrated with economic information in a rigorous, statistically sound manner. SEEA CF accounts can be compiled in both physical and monetary terms.

The SEEA EA was adopted by the United Nations Statistical Commission (UNSC) in 2021 and comprises an integrated and comprehensive statistical framework for organizing data on the location and size of ecosystems, their health, and the services (both physical and monetary) they provide to humanity. The SEEA EA takes a spatial approach, allowing ecosystems and their services to be mapped. In addition, as ecosystems provide valuable services that are integral to our wellbeing and economies, the SEEA EA regards individual ecosystems as ‘ecosystem assets’. Subsequently, the contributions of ecosystems to society’s well-being can be more easily compared to the goods and services we are more familiar with. These estimates are especially useful for decision-makers in terms of economic policy planning, cost-benefit analysis, and for raising awareness of the relative importance of nature to society.

Bhutan’s commitment to the SEEA was demonstrated when the SEEA CF in 2012 was adopted. In 2019, Bhutan was also one of the first countries in the region to launch a national SEEA programme. At the same time, Bhutan’s SEEA implementation is still limited, with only timber, minerals, waste and experimental energy accounts being published. Expansion beyond existing accounts and improving the quality and scope of SEEA accounts in Bhutan will provide better-quality, integrated data for evidence-based policy and plan formulation. However, strong implementation and policy uptake of the SEEA in any country has many

dimensions. It requires not only technical know-how but also an understanding of the policy priorities of the country, the institutional and data landscape, available human and financial resources and more.

Thus, in 2023, the NSB with the technical support of the United Nations Statistics Division (UNSD) embarked on the development of a plan for the implementation of the SEEA in collaboration with relevant stakeholders. This plan aims to guide the implementation and use of the SEEA in Bhutan, thereby contributing to GNH and other national priorities, and facilitating the achievement of the 2030 Agenda for Sustainable Development and other global commitments of Bhutan.

The remainder of the report is as follows: Chapter 2 outlines the global policy context of the SEEA and the international obligations of Bhutan in terms of multilateral environmental agreements (MEAs) which are relevant to the SEEA. Chapter 3 details national policies in Bhutan relevant to the environment, their data needs and how SEEA accounts can meet these data needs. Chapter 4 comprises an assessment of existing environmental data produced in Bhutan which can be used for compilation of SEEA accounts. Finally, Chapter 5 provides overall recommendations for moving forward with SEEA implementation in terms of institutional arrangements and capacity building for each thematic area. It also provides a stepwise roadmap for priority accounts which takes into consideration the policy demands in Bhutan (i.e., Chapters 2 and 3) and current data availability (i.e., Chapter 4).

2. Global Policy Context

Many environmental challenges that we face, such as climate change and biodiversity loss, are global or regional. In response to these challenges, countries have come together and signed international agreements. Key international initiatives in the environmental domain include the Sustainable Development Goals (SDGs), the Kunming-Montreal Global Biodiversity Framework (GBF), the Paris Agreement and the UN Decade on Ecosystem Restoration. A key component of many international agreements is the regular measurement and reporting of progress made towards achieving the relevant goals and targets contained therein. The SEEA provides a statistical framework for compiling relevant information for different facets of these key initiatives as highlighted below.

- SDGs and Agenda 2030: The SEEA supports the compilation of 40 indicators for nine SDGs. In addition, the implementation of the SEEA is itself an SDG sub-indicator (15.9.1b), which measures the mainstreaming of biodiversity values into national accounting and reporting (see section 2.1).
- The SEEA provides the recognized methodological basis for multiple headline indicators of the Kunming-Montreal GBF, notably Goal A.2 (extent of natural ecosystems), Goal B.1 & Target 11 (services provided by ecosystems) and Target 9 (benefits from the sustainable use of wild species).
- Paris Agreement: The SEEA provides critical information on the drivers and impacts of climate change and complements information from UNFCCC emissions inventories.
- UN Decade on Ecosystem Restoration: The SEEA EA can inform effective nature-based solutions for the UN Decade on Ecosystem Restoration.
- Beyond GDP: The SEEA can be used to derive indicators that help policymakers go beyond GDP, such as degradation or depletion-adjusted aggregates.

There has been a high demand for the implementation of the SEEA, especially in recent years. Many countries have begun implementing the SEEA EA in addition to the SEEA CF, particularly with the adoption of the SEEA EA by the UN Statistical Commission in 2021. In addition, in his report “Our Common Agenda”, UN Secretary-General Antonio Guterres urged all Member States to begin implementing the SEEA Ecosystem Accounting and acknowledged its use in going beyond GDP¹.

2.1. Multilateral Environmental Agreements

Multilateral Environmental Agreements are international treaties or agreements negotiated and adopted by multiple countries to address specific environmental challenges or issues of global concern. These agreements involve cooperation and coordination among participating member countries to work towards common environmental goals and objectives. They are legally binding agreements that establish rights and obligations for the signatory countries. Bhutan is a signatory and party to MEAs governing climate change, ozone depletion, biodiversity conservation and hazardous waste management.

¹Our Common Agenda – Report of the Secretary General, 2021. United Nations: https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf

The MEAs and other agreements listed below comprise a valuable opportunity for the development of the SEEA in Bhutan. The SEEA can be used to measure progress towards many MEAs as well as provide information on how to achieve the goals and targets of these MEAs more efficiently. In some cases, the measurement frameworks of the MEAs already explicitly use the SEEA in their monitoring frameworks. In other cases, the SEEA plays an important complementary role to the MEA measuring framework, by providing new information on the environment-economy nexus. Details of the relevant conventions, agreements and protocols that Bhutan has been obliged to or became a member of are listed below.

2.1.1. United Nations Framework Convention on Climate Change

This convention, adopted in 1992, aims to stabilize greenhouse gas concentrations in the atmosphere and prevent dangerous human interference with the climate system. It provides the framework for international cooperation on climate change, including the annual Conference of the Parties (COP) meetings. Bhutan ratified the United Framework Convention on Climate Change (UNFCCC) in 1995. As part of its obligations under the UNFCCC, the RGoB submits the National Communications and Biannual Transparency Reports. The Department of Environment and Climate Change (DECC), erstwhile National Environment Commission Secretariat (NECS), is the apex agency that compiles the data and information from various sectors such as the National Centre for Hydrology and Meteorology (NCHM), Department of Trade (DoT), Department of Industry (DoI), Department of Forests and Park Services (DoFPS), Department of Local Government and Disaster Management (DLGDM), etc. The DECC also includes national greenhouse inventories as part of its National Communication.

Greenhouse gas inventories provide emissions data for economic sectors, which is not consistent with economic data. Thus, SEEA accounts on energy and air emissions provide valuable information that complements the air emission inventories, by linking economic production and consumption with energy use and emissions of greenhouse gases. As the SEEA is consistent with the SNA, it can provide indicators on the emissions of industries. In addition, SEEA EA accounts can provide an ecosystem perspective on climate change and inform solutions that focus on land use planning and carbon sequestration, among others.

2.1.2. Paris Agreement

More recently, the Paris Agreement, which was adopted in 2015, builds upon the convention to accelerate and intensify global efforts to combat climate change and enhance adaptation efforts. Bhutan ratified the Paris Agreement, and the RGoB submits Nationally Determined Contributions (NDCs) which outline self-defined targets, policies and measures to mitigate emissions and adapt to climate change. Bhutan submitted its first NDC in 2016 and its second NDC in 2021.

2.1.3. Convention on Biological Diversity

Bhutan ratified the Convention on Biological Diversity (CBD) in 1995. The CBD sets targets and action plans for biodiversity conservation and its sustainable and equitable use.

In 2022, Bhutan along with other Parties to the CBD adopted the Kunming-Montreal Global Biodiversity Framework (GBF). The framework, which supports the achievement of the SDGs and builds on the Convention's previous Strategic Plans, sets out an ambitious pathway to

reach the vision of a world living in harmony with nature by 2050. The Kunming-Montreal GBF includes a monitoring framework which outlines indicators for Parties to use to measure progress towards goals and targets. Several goals and targets of the monitoring framework use the SEEA EA as the methodological basis for the compilation of their indicators. The National Biodiversity Centre of Bhutan is currently working on the 5th National Biodiversity Strategy and Action Plan and the 7th National Report to the CBD. Thus, the implementation of SEEA EA accounts in Bhutan would facilitate national monitoring of progress towards the goals of the GBF.

2.1.4. United Nations Convention to Combat Desertification

Bhutan ratified the United Nations Convention to Combat Desertification (UNCCD) in 2003, which is a global agreement that addresses the issue of desertification, land degradation and drought, particularly in arid, semi-arid, and dry sub-humid regions. Soil and land cover data are required for UNCCD reporting, and SEEA land cover and soil accounts could contribute significantly to UNCCD reporting.

2.1.5. Montreal Protocol on Substances that Deplete the Ozone Layer

Bhutan ratified the Montreal Protocol on Substances that Deplete the Ozone Layer in 2004. This international environmental agreement aims to protect the Earth's ozone layer by phasing out the production and consumption of ozone-depleting substances (ODS). It sets out specific control measures and timelines for the reduction and eventual elimination of ODS, including chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and other harmful substances. Many of these harmful substances can be systematically measured over time using SEEA air emission accounts.

2.1.6. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

Bhutan ratified this Convention in 2002, which aims to reduce the movements of hazardous waste between nations, and specifically to prevent the transfer of hazardous waste from developed to less developed countries, with the ultimate goal of protecting human health and the environment. The DECC is responsible for submitting reports on the Control of Transboundary Movements of hazardous wastes and their disposal to the Basel Convention. The scope of SEEA solid waste accounts includes transboundary movements of hazardous waste, and the accounting framework of the SEEA could ensure that these flows are measured and accounted for. The source data for the accounts could be retrieved from the DoT, Department of Industry (DoI), Department of Public Health (DoPH) and other relevant agencies, and further compiled and consolidated to understand the intensity of waste generated, amount of waste imported, hazardous waste generated from industries and health care, etc.

2.1.7. Ramsar Convention on Wetlands

Bhutan ratified the Ramsar Convention on Wetlands in 2012, which promotes the conservation and sustainable use of wetlands, recognizing their ecological importance and the benefits they provide to humanity. Wetlands encompass a variety of habitats, including marshes, swamps, lakes, rivers, peatlands and coastal areas. Based on this convention, Bhutan is responsible for designating wetlands of international importance as Ramsar Sites and submit periodic

reports on wetlands and their status. SEEA EA accounts could be used to keep track of the extent and condition of Ramsar sites as well as make explicit the value of the services these sites provide to the economy and humanity.

2.1.8. Other agreements and bodies

At the regional level, Bhutan is an active member of the Malé Declaration on Control and Prevention of Air Pollution and Its Likely Transboundary Effects for South Asia. Bhutan is also a member of various international bodies and regional groups such as the World Meteorological Organization and Global Telecommunications System Network, South Asian Association for Regional Cooperation (SAARC) and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) agreements. Under these agreements and memberships, Bhutan shares its environmental and socio-economic data with all relevant agencies. Thus, they are a potential source of input data for SEEA accounts, and SEEA accounts could be shared with these initiatives as well.

2.2. SDGs and the SEEA in Bhutan

The 2030 Agenda for Sustainable Development deserves special mention, as it provides an especially important opportunity to mainstream the use of the accounts in Bhutan. The SDGs were adopted by UN Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that by 2030 all people around the world enjoy peace and prosperity. Like the SEEA, the SDGs are an integrated framework; while each SDG may focus on the economic, social or environmental dimension, they are ultimately intrinsically connected.²

Similarly, the development ethos of GNH and the SDGs are very closely matched. Bhutan follows a cycle of five-year planning (FYP) and its FYPs and programmes are anchored on the long-term development goal of GNH. These goals and programmes are closely aligned with the SDGs. Three SDGs—Goal 1: No Poverty, Goal 13: Climate Action, and Goal 15: Life on Land—were given top priority for implementation in the 11th FYP (2013–2018). Moreover, in the 12th FYP (2019–2023), almost all SDGs are included in or closely linked to the FYP's objectives and indicators. This has allowed for Bhutan's longer-term development vision to be fully in line with the SDGs. The 12th FYP strategizes for achieving these global goals, laying out concrete and specific targets for Bhutan's development progress by 2023³.

The SDGs consist of 17 goals that also include cross-cutting issues as shown in the following figure below:

²Sustainable Development Goals: The SDGs in Action, 2023. UNDP, Bhutan
<https://www.undp.org/bhutan/sustainable-development-goals>

³UNDP, SDG Structured Dialogue Report. United Nation Development Programme, Bhutan

Figure 2.1: Sustainable Development Goals



(source: United Nations, un.org/en/sustainable-development-goals)

With 17 goals and 231 unique indicators, monitoring and reporting of the SDGs is a challenge. While there is no single, unified effort which covers all implementation, monitoring and reporting, there exist various initiatives to support these efforts in Bhutan. Some of the most prominent include:

- In 2021, an integrated dashboard called the Dashboard to Enhance Wellbeing of All (DEWA) was developed by the GNH Commission in collaboration with NSB, under the guidance and support of the UN Development Programme (UNDP).⁴ This dashboard was launched to monitor GNH, SDGs and development planning in Bhutan. The data from various ministries, departments and sectors are collected and compiled under the platforms provided in the DEWA Dashboard, which in turn provides real-time data for predefined indicators related to the SDGs, GNH and FYPs. It also provides a common Geographic Information System (GIS) interface platform for data visualization. An agency to take charge of the DEWA dashboard is yet to be identified following the transformation exercise in 2023.
- Bhutanese parliamentarians have come up with an action plan to mainstream SDGs and GNH advocacy, monitoring and oversight into legislative, oversight and budgetary efforts;⁵
- The GNH Commission has submitted two Voluntary National Reviews (VNRs) to the United Nations, in 2018 and 2021, respectively. These reports provide an overview of Bhutan's progress towards the SDGs and highlight key challenges and successes. The reports are regularly presented at the High-Level Political Forum on Sustainable Development; and
- UNDP has developed a strategic plan, 'UNDP Strategic Plan 2022-2025' to guide and support Bhutan in its path towards the SDGs

⁴DEWA, a dashboard to track SDGs, GNH and Five-Year Plans Launched, 2021. UNDP, Bhutan

<https://www.undp.org/bhutan/stories/dewa-dashboard-track-sdgs-gnh-and-five-year-plans-launched>

⁵Engaging parliamentarians in Bhutan on Sustainable Development Goals, 2021. UNDP, Bhutan

<https://www.undp.org/bhutan/news/engaging-parliamentarians-bhutan-sustainable-development-goals>

3. National Legislations and the SEEA in Bhutan

Bhutan is endowed with a rich natural environment of about 69.7% of the total land area under forest cover⁸ (i.e., consistent with what is mandated in the Constitution of Bhutan), and more than half of the country's landscape is designated as a protected area. The country is part of the Eastern Himalayan global biodiversity hotspot's region. The natural habitat of Bhutan ranges from subtropical broadleaf forest and grassland through temperate mountain forests, to alpine meadows, interspersed with marshlands and various water bodies.⁹

The GNH framework and Bhutan's Five-Year Plans (FYPs) prescribe following the middle path for any developmental activities in the country, which consider not only economic but also socio-economic and environmental activities. Envisaged by His Majesty, King Jigme Singye Wangchuck, the middle path for development is engraved in GNH as the Middle Path – National Environment Strategy for Bhutan.¹⁰ Furthermore, output 4 of the strategic objective of the draft 13th Five Year Plan enshrines “Ecological services enhanced and utilised and, climate resilience strengthened” giving further impetus to environmental protection and conservation whilst harnessing benefits from ecosystems.

Under the nine domains of GNH¹¹, the “Ecological Diversity and Resilience” domain is most directly informed by the SEEA accounts. The Ecological Diversity and Resilience domain includes indicators that measure people's perceptions and evaluations of their environment and assess environmentally friendly activities and consumption. It also covers hazards like forest fires and earthquakes.¹²

Another domain that can be informed by the SEEA is the “Living Standard” domain. While Living Standard refers to the level of material comfort as measured by income, conditions of financial security, housing and asset ownership, there are strong connections between this dimension and the SEEA. The central tenet of the SEEA is that the environment and economy are intertwined and interconnected, and the relationships between the two domains should be measured and understood. Thus, the SEEA can also provide information on the Living Standard domain, as the environment contributes directly to peoples' incomes (e.g., extraction of natural resources, etc.) as well as quality of life (e.g., cleaner air, amenity services, etc.).

⁸High-level Political Forum on Sustainable Development, 2021. UNDP, Bhutan
<https://hlpf.un.org/countries/bhutan/voluntary-national-review-2021>

⁷UNDP, Bhutan, 2023. Roles of UNDP in fulfilling SDGs and GNH in Bhutan.
<https://www.undp.org/bhutan/about-us>

⁸Department of Forests and Park Services, Ministry of Agriculture and Forest, 2017: National Forest Inventory Report
<https://www.dofps.gov.bt/download/4420/?tmstv=1693805196>

⁹National Environment Commission, 2014: National adaptation programme of action II: Addressing the risk of climate-induced disaster through enhanced national and local capacity of effective actions.

¹⁰National Environment Commission, 1998: The Middle Path, National Environment Strategy for Bhutan.
https://www.thegef.org/sites/default/files/ncsa-documents/Middle_Path.pdf

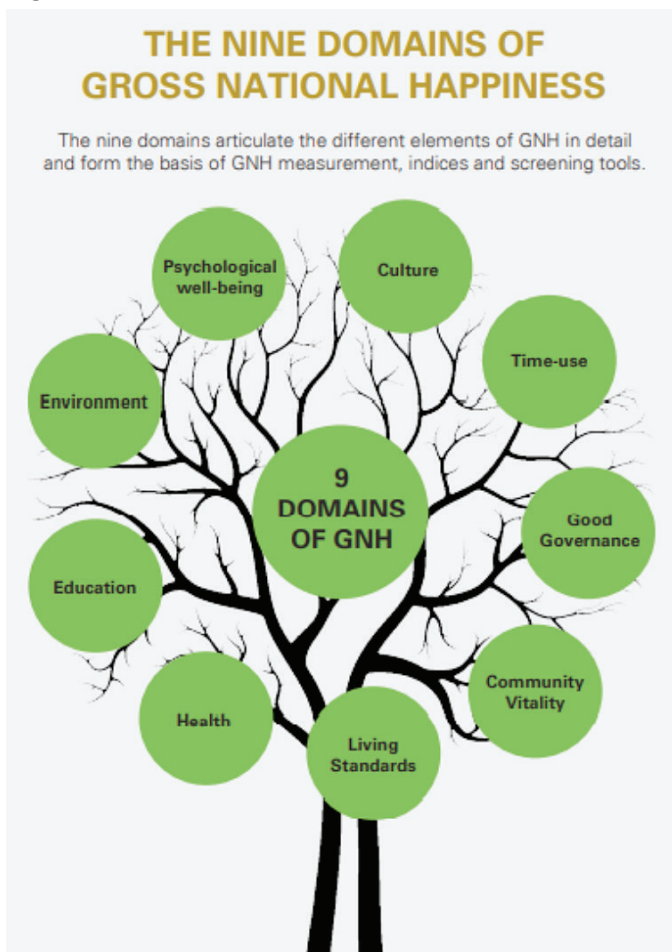
¹¹Nine Domains and Indicators of GNH, 2022. GNH Centre, Bhutan.
<https://www.gnhcentrebbhutan.org/the-9-domains-of-gnh/>

¹²Sustainable Earth Reviews: National Progress, sustainability and higher goals: the case of Bhutan's Gross National Happiness, 2019.
<https://sustainableearthreviews.biomedcentral.com/articles/10.1186/s42055-019-0022-9>

The NSB is the central agency responsible for coordinating and conducting statistical activities in the country and its primary mandate is to collect, compile, analyze, and disseminate high-quality and reliable statistical data and information for informed decision-making, policy formulation, planning, and monitoring of Bhutan's socio-economic development.

It has adopted the SEEA as the official national accounting framework to monitor and measure the environment and its relationship to the economy. The NSB started its SEEA programme in 2012 and is responsible for developing and disseminating the accounts and ensuring their quality and accuracy. The NSB is also responsible for providing technical assistance, training, capacity building and guidance to other government agencies, the private sector and other stakeholders to ensure the effective implementation of the SEEA.

Figure 3.1: Nine Domains of GNH



Currently, the NSB compiles and publishes annual environmental reports covering energy, minerals, timber and waste annually; These accounts are mainly in physical terms, though the mineral asset account is in both physical and monetary terms¹³. To facilitate the use of the accounts for policy and SDG reporting, the NSB also disseminates indicators and graphics in their SEEA releases.

3.1. National acts/legislation and reporting obligations

Bhutan's development policies fully recognize the impacts of development on the environment. This section outlines key legislation that require environmental information and data reporting. Importantly, this section outlines how the SEEA could contribute to measuring and monitoring these policies.

The National Environment Protection Act (NEPA) of 2007 deserves special mention. Even though there are several relevant acts and legislation, arguably the most central is the NEPA. This Act mandates the National Environment Commission Secretariat (NECS) to periodically

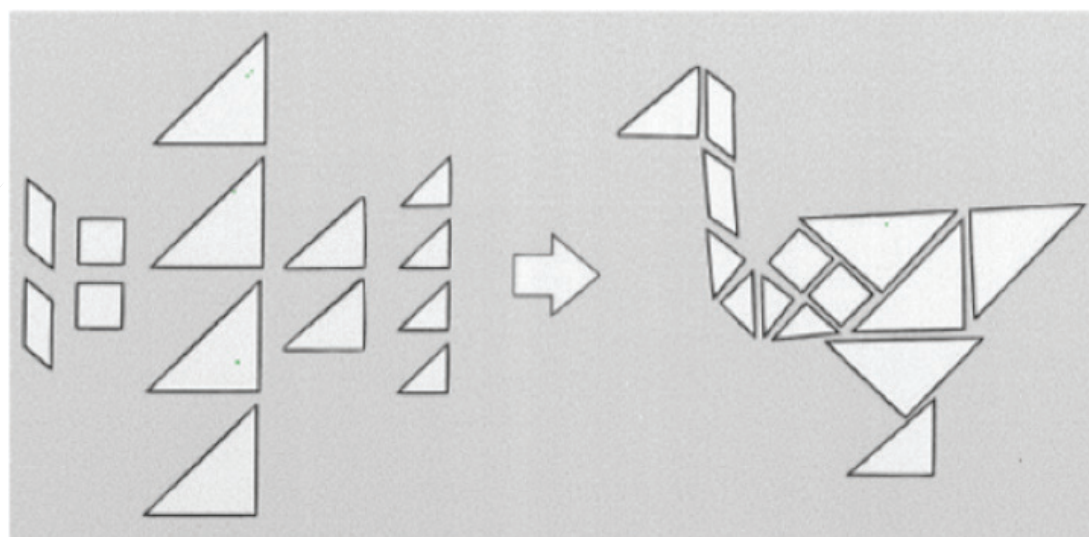
¹³Much of this work was done under a Danish International Development Agency (DANIDA) project on environmental accounts and statistics.

produce status reports on the environmental condition of the country and to establish environmental information systems at the national level. Under the 2023 government transformation initiative and the Civil Service Reform Act of 2023¹⁴, the National Environment Commission Secretariat has transformed into the Department of Environment and Climate Change (DECC) and sits under the Ministry of Energy and Natural Resources (MoENR). The DECC also serves as the Secretariat to the National Environment Commission (NEC).

The NEPA stipulates the protection and conservation of existing environmental resources, the sustainable use of these resources, and the minimization of environmental impacts. Carrying out the Act requires data on a whole range of natural resources, including information on forest, timber, water, land, air, soil and others. Thus, there is significant potential to use existing SEEA accounts to meet the reporting requirements of the Act, given that they provide robust and high-quality data on the supply and use of environmental resources and the impact of the economy on the environment.

Highlighted in Table 3-1 below are 13 environmental acts and legislation, including NEPA. The table also highlights some of the key data needed for monitoring these policies (including specific indicators, in some cases), as well as the specific SEEA accounts which could be used to provide a consistent, high-quality basis for monitoring and reporting (third column).¹⁵ In some cases, the specific SEEA accounts can be created with existing data that is produced as a product of the act. The value added to compiling SEEA accounts is that disparate, siloed data from different ministries is brought together and harmonized by NSB, thereby providing consistent information that is greater than the sum of its parts, to better inform policy (see Figure 3-2). In other cases, the creation of a relevant SEEA account may necessitate collecting and organizing new data. In both cases, the data requirements and related accounts provide information on the demand for SEEA accounts, which helps inform the prioritization of SEEA accounts given under Chapter 5 (section 5.3: Recommendations and Priority Accounts).

Figure 3.2: From disparate statistics to coherent and integrated accounts



¹⁴<https://www.rcsc.gov.bt/wp-content/uploads/2023/01/Enactment-of-CSR-Act.pdf>

¹⁵The list of existing acts and legislation listed below were validated and confirmed with the relevant stakeholders during the consultation meetings. The data and information required were collected directly from the national task force teams already nominated by NSB for this project and from other relevant agencies.

Table 3.1: Acts and legislation related to environmental information reporting

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
Constitution of the Kingdom of Bhutan 2008	<ul style="list-style-type: none"> -Requires the Government to secure ecologically balanced sustainable development while promoting justifiable economic and social development and ensuring a safe and healthy environment. -Mandates people to contribute towards the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation including noise, and visual and physical pollution through the adoption and implementation of environment-friendly practices and policies. -Key data requirements include an indicator of forest cover, as the Constitution mandates a minimum of 60 percent forest coverage for all time to come. 	<ul style="list-style-type: none"> -SEEA land cover accounts can organize existing land cover data and provide a consistent time series data to ensure that the minimum amount of forest coverage is being met. They also provide information on what types of land cover type conversions are taking place over time. -SEEA EA accounts can also be used to systematically measure the health/ ecological condition and flow of services (e.g. air filtration, carbon sequestration, cultural services, etc.) from forests. 	<ul style="list-style-type: none"> -All relevant agencies on environment and biodiversity, with oversight by the Parliament of Bhutan

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
<p>National Environment Protection Act (NEPA), 2007</p>	<ul style="list-style-type: none"> - Calls for the establishment of an “effective system to conserve and protect the environment” which adheres to the Middle Path Strategy under which “economic development and environmental conservation shall receive equal priority”. - Requires the protection and conservation of existing environmental resources, sustainable resource use, and minimizing environmental impacts. - Requires the establishment of an environmental information system at the national level. -Key data requirements include: <ul style="list-style-type: none"> I) Data on the environmental condition of the country for periodic reporting; II) Integrated, coherent data on resource use and economic activity to measure adherence to the Middle Path Strategy. 	<ul style="list-style-type: none"> -Efficiency and productivity indicators derived from various SEEA accounts (e.g. water productivity, air emission intensity, energy intensity) can help ensure adherence to the Middle Path Strategy, as these indicators directly compare resource use to economic output. - SEEA accounts can also be used for decoupling analysis, to see the extent to which GDP can increase while pressures on the environment decrease (e.g. water use, energy use, etc.). -More broadly, by providing consistent, high-quality information on the environment-economic nexus, all SEEA accounts can be thought of as part of the monitoring/reporting system that helps conserve and preserve the environment. 	<p>-NECS / DECC as the lead agency</p>

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
Water Act of Bhutan, 2011	<ul style="list-style-type: none"> - Ensure water resources are protected, conserved and/or managed in an economically efficient, sustainable and equitable manner. - Key data requirements include: <ul style="list-style-type: none"> I) Disaggregated data on water use: The act prioritizes water use in accordance with a prioritized order (i.e. i. water for drinking and sanitation; ii. water for agriculture; iii. water for energy, etc.); II) Data on water quality: The act prohibits the discharge of chemical, radiological, radioactive, medical or any other hazardous waste into water bodies. 	<ul style="list-style-type: none"> - SEEA physical water flow accounts provide consistent data on water use by economic industry (e.g., energy industry) and households, helping monitor whether the water use priorities of the Water Act are met, and in a manner consistent with the Middle Path Strategy - SEEA water emission accounts systematically track point and non-point source emissions, including heavy metals, hazardous waste, other pollutants and substances which have an unfavorable influence on the oxygen balance 	<ul style="list-style-type: none"> -DoW (lead) -DECC and others as relevant
Waste Prevention and Management Act of Bhutan, 2009	<ul style="list-style-type: none"> - Ensure that waste is reduced, reused and recycled; waste is disposed of in an environmentally sound manner; and that there is coordination amongst implementing agencies. - Key data requirements vary according to the agency. For example, the DoI is responsible for ensuring waste prevention and management with respect to industrial waste, the MoAL is responsible for ensuring waste prevention and management from the agricultural sector, etc. The NEC is responsible for collecting and periodically reporting this information to the Cabinet and the Parliament 	<ul style="list-style-type: none"> - The production of SEEA solid waste accounts can be of use for this act, as they provide coherent, compatible data on the amount of solid waste generation by different economic industries. Importantly, the accounts are also meant to include information on whether/how this waste is collected, treated and disposed of. By using consistent classifications and definitions, information on solid waste from different industries can be compared and reported on in a uniform manner. 	<ul style="list-style-type: none"> -DECC -Ministry of Infrastructure and Transport (MOIT) -Thromdes -Dzongkhags

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
Waste Prevention and Management Regulation, 2012 and 2016	<ul style="list-style-type: none"> - Sets up waste management plans and strategies handling industrial waste, municipal waste, medical waste and e-waste. - Set up rules and regulations for waste management with well-defined roles and responsibilities of relevant government agencies. - Key data requirements include data on the amount of industrial waste, municipal waste, medical waste and e-waste that is properly managed/disposed of. 	<ul style="list-style-type: none"> - SEEA solid waste accounts could inform the performance of these regulations (see above), as chemical and healthcare waste, radioactive waste, etc. are within scope. 	<ul style="list-style-type: none"> -Implementing agencies (Municipal waste – Thromdes, Medical waste – DoPH, Industrial waste – DOI, E-waste – Department of Information Technology (DoIT)) Monitoring and evaluating agency – DECC under MoENR
Land Act of Bhutan 1979, revised 2007	<ul style="list-style-type: none"> - Sets the basis for land tenure in Bhutan, including land ownership, categorization, and acquisition process and systems. - Defines clear roles and responsibilities of agencies in connection to land issues in the country. - Key data requirements include data on land ownership, land use, land cover, land management plans and land resources. 	<ul style="list-style-type: none"> - SEEA land cover accounts track the area of different types of land cover for the whole country using consistent classifications over time. They can also identify land cover conversions. SEEA land use accounts do the same, using land use classifications, and land ownership accounts are also possible. 	<ul style="list-style-type: none"> -National Land Commission Secretariat (NLCS)

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
Biodiversity Act of Bhutan 2003, revised 2023.	<ul style="list-style-type: none"> - Ensure conservation and sustainable use of biochemical and genetic resources. - Promote the equitable sharing of benefits derived from the use of genetic resources while promoting technology transfer and capacity building related to the conservation and sustainable use of biological diversity. - Key data requirements: Consistent data on the supply and use of biological and genetic resources, both natural and cultivated. 	<ul style="list-style-type: none"> - The SEEA CF provides a way to account for the supply and use of cultivated non-cultivated biological resources. Cultivated biological resources can be accounted for through specific accounts depending on the resource (e.g. aquatic resource accounts; timber accounts). In addition, genetic material services can be accounted for through SEEA EA ecosystem service accounts. - The SEEA also includes accounts for natural biological resources and genetic material services. - The SEEA framework harmonizes this data and provides information on additions and reductions of these resources. 	<ul style="list-style-type: none"> -National Biodiversity Centre (NBC) -Ministry of Agriculture and Livestock (MoAL)
Electricity Act of Bhutan, 2001	<ul style="list-style-type: none"> - Proper planning, implementation, operation and monitoring of electricity related issues and programmes in the country. - Defines roles and responsibilities of relevant agencies, including the private sectors' participation in supplying electricity to the whole of the country. - Key data requirements <p>I) Consistent, regularly provided data on energy generation, transmission and distribution, including exports and imports of electricity;</p> <p>I) Electricity generation from renewable energy resources;</p> <p>III) Information on revenue from selling electricity and costs to consumers.</p>	<ul style="list-style-type: none"> - SEEA physical energy flow accounts (PEFA) include all of the key data required for this act in a comprehensive, coherent package. The PEFA includes data on 1) natural resource extraction for energy, including renewables; 2) how these natural resources are produced into electricity; 3) how electricity is used by various industries and households; and 4) losses and residuals of electricity which flow back to the environment (e.g. dissipative heat). -Importantly, monetary energy flow accounts can be derived from PEFA which are entirely consistent with the physical accounts. 	<ul style="list-style-type: none"> -Bhutan Electricity Authority (BEA) -Department of Energy (DOE) of the MoENR

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
Environment Assessment Act, 2000	<ul style="list-style-type: none"> - Establishes procedures for environmental impact assessments for strategic plans, policies, programmes and projects, with an aim to reduce adverse effects on the environment. - The DECC is responsible for issuing environmental clearance based on the results of the assessment, including its contributions to sustainable development and adherence to existing environmental commitments. - Key data requirements: Parties seeking clearance will need data to conduct impact assessments, potentially including scenario analysis. 	<ul style="list-style-type: none"> - SEEA accounts, particularly SEEA EA accounts can provide important contextual information and information upon which to conduct scenario analysis. - At the same time, SEEA CF accounts can provide important benchmark information on natural resources from a macro perspective. 	-DECC
Forest and Nature Conservation Act, 1995 (Updated version – Forest and Nature Conservation Act, 2023)	<ul style="list-style-type: none"> -Regulation of utilization and conservation of forest and non-forest products including regulations on water, soil and waste management. -While not specifically mentioned in the Act, reports such as National Forest Inventories are key to the preparation of sound management plans. -Key data requirements: Reporting on allotment of timber and non-wood forest products, trade and transport of forest products. 	<ul style="list-style-type: none"> - Data related to forest/ timber resources are made available by this act, which could be aggregated and made consistent over time through the compilation of SEEA asset accounts for timber resources. These accounts can provide consistent information on the industries/households responsible for timber supply and use and can be in both physical and monetary terms. 	-DoFPS -MoENR

¹⁶Policy Scenario Analysis Using SEEA Ecosystem Accounting, 2021. United Nations: <https://seea.un.org/ecosystem-accounting/policy-scenario-analysis>.

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
National Biodiversity Strategic Action Plans	<ul style="list-style-type: none"> - Provide a strategic action plan for the national implementation of the Kunming-Montreal Global Biodiversity Framework, which is aimed at the protection and preservation of biodiversity. - The most recent NBSAP is from 2014 and outlines 20 national targets, including targets on mapping and monitoring habitats and ecosystems. - Key data requirements (portion taken from 2014 NBSAP): <ul style="list-style-type: none"> I) Valuation of ecosystem services and integration into national accounting systems II) Mapping of high-biodiversity value habitats and protected areas, including information on loss and fragmentation III) Information on ecosystem conditions, including ecosystem degradation. 	<ul style="list-style-type: none"> - Compilation of the SEEA EA would meet several of the key data requirements listed in the 2014 NBSAP. - Extent accounts provide maps of protected areas and high-biodiversity areas, providing information on loss/fragmentation. - Condition accounts provide information on ecosystem conditions according to an internationally recognized condition typology. - Ecosystem service accounts in physical and monetary terms are designed to be integrated into national accounting systems. 	<ul style="list-style-type: none"> -NBC -MoAL
Mine and Mineral Management Act, 1995	<ul style="list-style-type: none"> - Sets terms for management of exploration and mining activities, including feasibility studies and impact assessments. - Mandates to have proper conduct of mining operations, management of exploration and mining activities, etc. -Key data needs: <ul style="list-style-type: none"> I) Registers, maps, and records of all mining leases; II) Site-specific data on soils, surface and sub-surface waters, air quality, plant and animal life. 	<ul style="list-style-type: none"> - SEEA energy and mineral asset accounts can use the data provided under this Act on mining leases, etc. to provide an aggregate view of the energy and mineral assets of Bhutan. - SEEA EA accounts are spatially explicit and can provide site-specific data on the surrounding ecosystems of potential sites. 	<ul style="list-style-type: none"> -DGM -MoENR

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
Mines and Minerals Management Regulations, 2020	<ul style="list-style-type: none"> - Provides procedures for registration of mines, information and data compilation on mines and minerals availability, records of mining and quarrying leases, procedures and management for mining operations, mandates for keeping records, reports and notices by mining and quarry holders to DGM, provision for monitoring, offences and sanctions on mining and quarries. - Key data needs are mainly administrative data on mining operations. 	<ul style="list-style-type: none"> - The role for the SEEA is similar to the Mine and Minerals Regulation Act of 1995. 	<ul style="list-style-type: none"> -DGM -MOENR

Act/Legislation	Policy goal/target and key indicators	SEEA accounts and how they can be used to inform the key data needs/indicators	Lead responsible agency (i.e., source data providers and users of the accounts)
<p>Climate Change Policy of the Kingdom of Bhutan, 2020</p>	<p>- Identifies four key areas of action to accomplish its goals: emissions reduction, adaptation to the negative effects of climate change, guaranteeing adequate support measures, and effective stakeholder engagement:</p> <ol style="list-style-type: none"> 1. Objective 1: Decoupling of GHG emissions from industries including mining, transport and waste sectors; 2. Objective 2: Ensuring recognition of the special needs of vulnerable groups through the National Adaptation Plan (NAP) process, integration of climate change adaptation planning and implementation with national and local level plans wherever possible; 3. Objective 3: Coherent and coordinated nationally driven approach for accessing climate finance to prioritize climate actions, from international and national climate mitigation funds in support of a national resource mobilization strategy; encourage private sector investment in climate change action; 4. Objective 4: Ensures active stakeholder participation; produce synergies across different legislation, policies, programs, actions and thematic issues for effective use of resources for climate change actions. 	<p>- The SEEA provides valuable data on climate change mitigation (both through air emission accounts and carbon accounts), meeting the needs of objective 1. While air emission inventories are important, only SEEA accounts are disaggregated according to economic industries, and disaggregation according to economic industry is needed to see whether decoupling is taking place.</p> <p>- SEEA EA accounts can help address</p> <p>Objective 2, as they measure the provision of ecosystem services which are important for climate change adaptation (e.g. water supply, soil/ sediment retention services, etc.).</p>	<p>-DECC -MoENR</p>

3.2. Institutional framework for policy and planning

The institutional landscape for policy and planning has recently changed with the 2023 government transformation. Upon dissolution of the GNHC during the government transformation exercise, the Perspective Planning Division and the Research and Evaluation Division were placed under the Cabinet Secretariat. These two divisions have assumed the mandate to direct and coordinate the formulation of national plans and programmes and the subsequent review of all plans and policies implemented. As such, there is a strong need to establish a mechanism of data sharing to improve the availability of statistics for supporting evidence-based decision making.

From the financial perspective, the Department of Planning, Budget and Performance (DPBP) under the Ministry of Finance is an important agency that allocates resources for development plans and programmes. The main roles of this department is to formulate annual budgets and apportionment bills based on national priorities (based on SDGs, GNH and FYPs). It also streamlines the budget for green, ecological and environmental projects that align with the government's sustainability goals. Green-funded projects are monitored and evaluated using performance indicators to check the progress and efficiency of fund utilization.

3.3. Institutional frameworks for compiling SEEA accounts: current status and needs

Bhutan has adopted a statistical system that has characteristics of both centralized and decentralized systems. The role and the functions of the NSB are communicated through the Government Executive Order of 2006 and NSB is mainly entrusted with the responsibility of production and publishing of economic, environmental, population and social statistics.

To carry out the statistical functions in line agencies and dzongkhags, statistical officials are placed depending on their needs and demands. These officials not only serve as the NSB's representatives in these agencies but also carry out sectoral statistical mandates. As regards the production of environmental accounts, NSB has taken on the primary responsibility to compile and produce environmental accounts according to the SEEA, although line agencies and dzongkhags also produce statistics based on their own statistical needs to monitor plans and programmes and to fulfil reporting obligations of multilateral conventions and agreements.

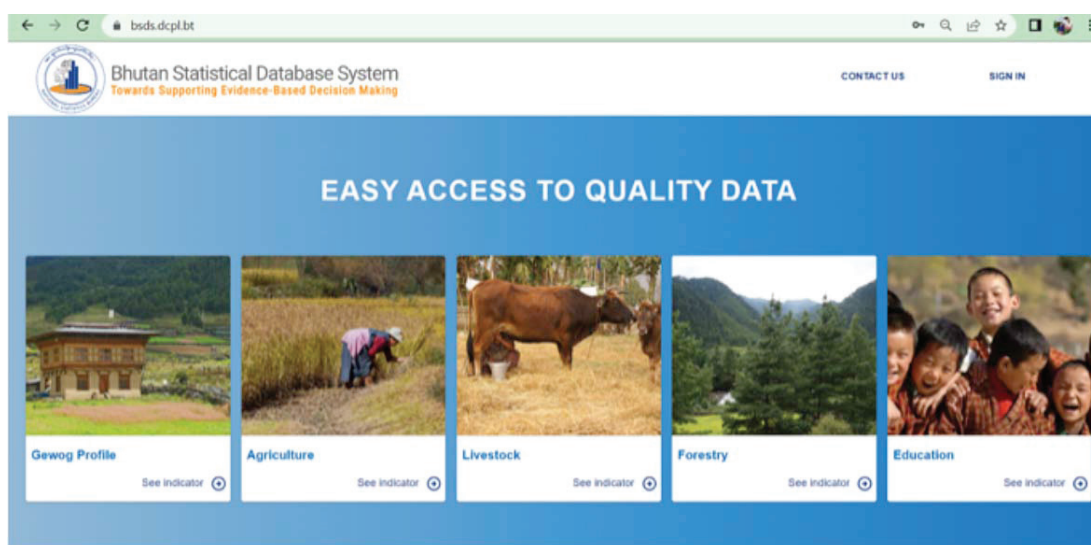
Despite limited resources, the NSB has sustained its work on environmental accounts to a limited extent. Since 2017, the NSB has been compiling data and information for energy, minerals, waste and timber accounts using the SEEA-CF. The focus has been on improving these existing accounts. At the same time, there are no formal mechanisms or groups—whether technical or non-technical—that facilitate coordination for the production of the SEEA.

In terms of data sharing, the NSB as a competent statistical authority has been enforcing the proper guidelines and standards in conformity with international and national standards. However, consultations with line ministries indicated that stronger data-sharing mechanisms are needed. To meet this need, the NSB has developed the Bhutan Statistical Database System (BSDS) which is designed to be a comprehensive data compilation, integration, and maintenance system in the country. The purpose of the system is to streamline proper

administrative data collection, validation, and dissemination from local (gewog) to the national level despite providing easy access to quality data from a single system.

This system will function as a data-sharing platform for government agencies as well as a dissemination platform for other data users. The BSDS has included five different sectors, namely Gewog Profile, Agriculture, Livestock, Forestry, and Education in its dashboard. For the Gewog Profile, Agriculture, and Livestock sectors the data will be collected and entered into the system from the Gewog. However, for the Forestry, and Education sectors, their existing systems will be integrated with the BSDS. This will be further populated by other sectors that have been reflected in the 13th Five-Year Plan (FYP). The web-based statistical system is being piloted which can be accessed at www.bsds.nsb.gov.bt as shown in figure below.

Figure 3.3: Data on five sectors included in BSDS



BSDS is one of the initiatives that entails the vision of integrating the data accounting for various sectors including environment and ecosystems under one roof. Having the data in one place and making it accessible not only to the respective government agencies but also to the general public, could facilitate the compilation of the accounts. Moreover, the data compiled and uploaded in this system could be used by multiple types of users (e.g., private sector, different ministries, etc), for various purposes.

Any data required for environment and ecosystem accounting as per the SEEA framework could be retrieved/extracted at any time thus making it human-independent. Furthermore, there is a potential to integrate a SEEA framework processing and analysis tool or dashboard in BSDS, so that any physical or monetary asset accounting of any resources could be retrieved in the forms of graphs, tables, images and even spatial databases which could be easy and quick to interpret and analyse.

4. Data Assessment

The previous section focuses on the policy demands that can be answered by the SEEA and provides input for potential priority SEEA accounts from a user perspective. However, implementation of the SEEA must also take into consideration the supply of data, the current data landscape and the potential challenges that data compilers may face. The main objective of the desk reviews and stakeholder meetings were to undertake an initial assessment of data availability and their sources which could be used to compile SEEA accounts.

In many cases, especially for the SEEA CF, the key data required to compile the accounts can be derived from existing national data that is already collected by line ministries. It is important to note that the data needed to compile the SEEA does not only comprise environmental data (e.g., water or energy statistics). Depending on the specific SEEA account, compilers may also make use of national accounts, trade, traffic, balance of payments or administrative data, etc.

4.1. Mineral Resources

Mineral accounting in Bhutan specifically consists of tracking and managing the minerals production, extraction and utilization of mineral resources in the country. The NSB currently compiles mineral accounts in its Annual Environmental Accounts Statistics (AEAS).¹⁷ In particular, NSB compiles and disseminates both physical and monetary asset accounts for coal, dolomite, limestone, gypsum, talc, quartzite and iron ore. The mineral accounts provide insight into the feasibility, sustainability and cost of current and future extraction and could be used to prepare plans for the sustainable use of minerals, as per the Constitution, NEPA, and the Mines and Minerals Management Act.

Data accounting for minerals is carried out solely by Department of Geology and Mines (DGM) which includes mine locations, minerals' stocks, discovery of new mineral sources. These are collected from time to time, as required. The data on extraction of minerals from all mine sites are monitored and recorded by DGM with annual submission to NSB. They are also responsible for collecting and analyzing geology and mineral data along with preparing geological map of Bhutan and topo-sheet.¹⁸

The Department also has the records on physical and monetary asset accounting extracted and exported minerals on annual basis, which feed into the accounts compiled by NSB. Both metallic and non-metallic mineral resources data are available but due to no or little extraction of metallic minerals, data on metallic mineral resources are not reflected or reported.

The Department has planned to have more detailed survey using the latest mineral survey equipment and methods for the entire country. The main objective of this survey is to collect more reliable and accurate data for the mineral resources across the country and simultaneously to develop spatial data in the form of maps and figures which is also one of the requirements of SEEA CF for resource accounting purpose. According to DGM, this survey data on minerals and geology needs to be compiled, managed and disseminated with the

¹⁷Annual Environmental Accounts Statistics, 2021. National Statistics Bureau (NSB), Royal Government of Bhutan

¹⁸Mineral Portal of Bhutan, 2021. Department of Geology and Mines, Ministry of Energy and Natural Resources. <https://dgm.gov.bt/MineralPortal/AboutDGM.do>

various relevant agencies including NSB through online data sharing mechanism to have data uniformity and reliability.

Until 2023, data on surface collection on sand and boulders are handled by the DOFPS. Since the introduction of the new Forest and Nature Conservation Act (FNCA) 2023, these responsibilities on sand and boulder will be handed over to DGM. But this is a work in process as of Oct 2023.

The quality and scope of the minerals account compiled by the NSB could be improved. The NSB uses minerals and mines data collected and it includes mine locations, minerals' stocks and the discovery of new mineral sources to some extent. The data quality can be improved by ensuring timeliness and granularity. Several data discrepancy has been identified by the NLCS recently due to a nation-wide data compilation and cleaning exercise.

There is no specific need of increased resources, capacity building or information system for DGM to continue with the current reporting. However, the data from DGM could be incorporated with the national BSDS for easy data sharing and use for SEEA as well. For this, an API needs to be set up along with training of manpower at DGM and NSB.

4.2. Energy Resources

The Department of Energy (DoE) under the Ministry of Energy and Natural Resources (MoENR) is responsible for compiling and managing energy (electricity from all sources including hydro, solar and wind sources) and biomass energy data (collected from department of forests) while the entire fossil fuel data are recorded and maintained by the Department of Trade (DoT).

The NSB currently compiles physical and monetary asset accounts for energy. NSB has also developed both physical and monetary asset accounts for various forms of energy (electricity, fossil and biogas fuels), which is in line with the requirement of SEEA framework.

There is no prescribed data sharing and dissemination system with the NSB for the input data from either DoE, DoFPS or DoT, which means that data processing and analysis faces time delays and manual processing. The DoE does however provide technical support in terms of data compilation, management and dissemination of data to other relevant agencies through their online sharing mechanism.

Moving forward, the DoE plans to develop an integrated online platform for the collection, compilation and dissemination of energy data with various relevant stakeholders through the Business Intelligence Dashboard Integrated System (BIDIS). The Department aspires to combine all forms of energy as into one system including the data compiled and managed by DoT and DoFPS so that all the energy resources and use data are made easily available under the department. The energy data could be incorporated in the BSDS of NSB with corresponding set up of systems at DOT, DOFPS and DOE along with training of personnel.

4.3. Solid Waste

The NSB conducted the first nationwide inventory survey in 2019. Prior to the inventory survey in 2019, the only data on waste that policy makers could access was that from administrative records maintained by municipal offices in different regions, and this information only covered

waste collected through the waste collection service, which is only available in urban areas. Data was sorely lacking despite clear policy need. For instance, the 12th FYP defines national level waste management as a key performance area and includes a number of national level indicators, including the absolute amount of solid waste (in tonnes) that is recycled.¹⁹

In 2019 a National Waste Inventory Survey (NWIS) was conducted, which revealed that Bhutan generates 172.16 Metric Tonnes (MT) of solid waste per day (per capital generation of around 0.23 kilograms per day)²⁰. While the NWIS greatly broadened the amount of waste data available, information of waste in rural areas are not available, though the thromdes and dzongkhag towns have some information on waste collected and disposed at the landfill sites. There are also no data/information on the types of segregated solid waste at the moment. The amount of waste transported to the landfills and the amount of waste been recycled or reused are also not available.

Moving forward, the NSB needs to partner and work with NECS/DECC and other relevant agencies to collect regular information on solid waste from four thromdes and dzongkhags. A mechanism needs to be put in place to at least compile and publish statistics on solid waste. There is also a need to conduct more comprehensive and regular waste inventory surveys to collect accurate data on the amount and value of types of waste generated, recycled, and disposed off in the country, including rural areas.

4.4. Land Resources

The National Land Commission Secretariat (NLCS) serves as the central authority for land administration, management, and spatial data within the country. Its statutory responsibility encompasses overseeing the ownership and use of land to foster socioeconomic development and environmental well-being. The NLCS achieves this through efficient land administration, ensuring land tenure security, promoting equitable access to land, facilitating land market operations, optimizing land resource utilization, and preserving ecosystems via robust spatial and land use planning and zoning.

Over time, NLCS has amassed a comprehensive repository of spatially formatted land information, including updated cadastral data covering the entire country and 1:25,000 scale base mapping for southern Bhutan. The base mapping for the rest of the country will be updated in the coming years with technical support from the Japan International Cooperation Agency. Within NLCS, the Center for Geo-Information Coordination (CGISC) operates independently under the NLCS within the purview of Geo-Information (GI) Policy 2018. CGISC acts as a coordinating hub for formulating and enforcing regulations, standards, and bylaws encompassing all facets of geo-information. Recognizing the indispensability of geospatial information in effective planning and decision-making, CGISC collaborates with a diverse array of experts and resources from various geospatial information member agencies and end-users. Currently, CGISC has around 34 member agencies, and their data is collected.

Furthermore, NLCS recently published the Land Use Land Cover 2020 mapping as part of the National Land Use Zoning Project (NLUZ) project, which will be updated every 5 years. The

¹⁹Bhutan Waste Accounts Report, March, 2021. UNESCAP
https://www.unescap.org/sites/default/d8files/2021-04/Bhutan_Waste_Accounts_Report_2021.pdf

²⁰Bhutan Waste Accounts Report, March, 2021. UNESCAP
https://www.unescap.org/sites/default/d8files/2021-04/Bhutan_Waste_Accounts_Report_2021.pdf

NLUZ Baseline Report 2023, launched on 18th September 2023, categorizes land uses into 9 macro, 23 micro, and 23 nano zones, including High Conservation Values (HCV) zones, based on land use genres and relevance. This classification promises to resolve land use conflicts and enable more accurate land accounting. NLCS is also engaged in collaborative efforts with various government departments, including Agriculture, Livestock, Forest, Culture, and Tourism, to address land-related matters such as wetland protection (Chhuzhing), reaping benefits from rangelands, and the allocation and management of limited arable state land. In addition, the Department of Surveying and Mapping (DoSAM) is actively advancing the National Spatial Data Infrastructure, a key initiative aimed at enhancing the utility of geospatial information. This infrastructure seeks to reduce data duplication, enhance data accessibility, and bolster data reliability through an upcoming Geo-Portal.

From the AEAS 2021, some data on land is disseminated through green economic indicators. For example, NSB disseminates indicators on the percentage of degraded land by type of degradation, proportion of agricultural land to total land area, etc. However, these indicators are based on statistics from MoAL, and NSB does not currently compile land cover and land use accounts.

4.5. Soil Resources

The National Soil Service Centre (NSSC) is an agency of the DoA, under the MoAL, which is responsible for collecting and disseminating soil data and information for the entire country. The NSSC maintains a Sustainable Land Management Database and undertakes soil-related research. The Centre is responsible for updating the national data in the global soil database system prepared by the World Overview of Conservation Approaches and Technologies (WOCAT) as and when required. It has also initiated an updated version of the National Soil Map, 2021 that includes data on soil resources (soil type, soil composition, minerals and chemical content in soil; soil conditions and also changes in land use) for the entire country.

Most of this data is disseminated in the form of analysed and published data without any sharing mechanism with other relevant agencies. Soil data due to changes in land cover is available but changes in soil quality and changes in soil environment are not available for the entire country. Most of these data are project-specific and based on the areas of interest. NSSC has also digitized their data and constructed digital soil maps for certain locations.

No extensive data on soil extraction, soil erosion, catastrophic losses of soils, various mineral contents in soil are available at the moment. Thus, in order to compile soil resource accounts, ideally, a more extensive soil survey would be conducted, which could be complemented through modelling and remote sensing data.

4.6. Forest and Timber Resources

The Department of Forests and Park Services (DoFPS) is the national agency for planning, implementation and monitoring of all forestry related activities in the country. In the AEAS, 2021, NSB published data on the quantity of forest area in terms of percentage and square kilometres of forest coverage. In addition, NSB disseminates a physical timber asset account that includes supply (using data from NRDCL and DoFPS) and consumption (commercial and concessional uses) of timber on an annual basis.

For National Forest Inventories (NFI), DoFPS carries out periodic surveys (the 2nd NFI being completed and published in June 2023²¹) to update its existing 1st NFIs. This includes two reports: (i) National Forest Inventory Volume I: State of Forest Report, and (ii) National Forest Inventory Volume II: State of Forest Carbon Report. Annual Forestry Statistics (AFS) are also initiated by the department that contains all the information required on forestry products which is reported on annual basis.

DoFPS also developed an online system, the Forest Information Reporting and Monitoring System (FIRMS) which is solely used within the agencies for accessing and uploading forestry data. The system is further complemented by the web-based Spatial Decision Support System (SDSS), which supports decision-making through the multicriteria analysis of geospatial data and it is used primarily for issuance of clearance by the Departments.²²

For spatial data sharing at the National level, DoFPS is a member of Center for Geo-information (CGI) under the National Land Commission (NLCS), and CGI is currently in the process of building the National Spatial Data Infrastructure (NSDI) in collaboration with GovTech for seamless sharing of GI data among agencies as well as for public use.

The Forest and Nature Conservation Bill Act 2023 has been enacted which entails handing over responsibilities of monitoring and evaluating sand, gravel/boulders' extraction and permitting with resource study to DGM.

The department has also recently released an Ecosystem Assessment on The Economic Valuation of Forest Resource Services. The assessment looks at several forest ecosystems services, including provisioning services, cultural services, and regulating services.²³

Besides this, all the data compiled and maintained by the department are available as per the SEEA requirement. However, these available data need to be further furnished, updated and verified using more recent scientific and technology-based methods and equipment.

4.7. Water Resources

Water resources is one of the most important resources for Bhutan as electricity generated by hydropower plants provides significant revenue to the government. The NSB currently disseminates some indicators based on the available data. For example, in the AEAS, 2021, NSB has included indicators on the total population's access to improved drinking water and the proportion of urban and rural population with access to improved drinking water resources. The National Integrated Water Resources Management Plan (NIWRMP)²⁴ also has information on water availability, demand, balance and also an integrated plan for the future.

²¹State of forest carbon report: National Forest Inventory Volume II, June, 2023. Department of forest and park services. <https://www.dofps.gov.bt/download/4424/?tmstv=169380519>

²²Department of Forest and Park Services Spatial Database, Ministry of Environment and Natural Resources. <https://sdss.dofps.gov.bt/>

²³Forest in Bhutan: Economic Value of Forest Ecosystem Services in Bhutan, 2019. Watershed Management Division, Department of Forest and Park Services, MoENR
file:///C:/Users/ASUS/Downloads/Economic-Valuation-of-Forest-ES-in-Bhutan_Final-Report.pdf

²⁴Bhutan National Integrated Water Resources Management Plan 2016. National Environment Commission.

Water is a cross sectoral issue and several players are involved in the data collection and dissemination of water data. A list of agencies and their roles in the water sector are summarized as below:

- The Department of Water (DoW), newly formed in 2023, is responsible for collecting data on various water resources available in the country, allocate water, regulate and coordinate activities for the water sector.
- National Centre for Hydrology and Meteorology (NCHM) collects, archives and shares all hydro-meteorology data of the entire country. This includes river flow, flood height, snowfall, glaciers, rainfall, temperature and other weather data.
- DECC issues environmental clearances and ensures their compliance.
- The Ministry of Infrastructure and Transport (MoIT) through the Infrastructure Planning and Flood Adaptation Division (IPFAD) under the Department of Human Settlement, looks after planning and design of flood mitigation structures. Similarly, the Water and Sanitation Division (WSD) under the Department of Infrastructure Development (DoID) in the MoIT through infrastructure development strives to provide safe and affordable water, adopt measures to combat the impacts of climate change on drinking water infrastructure, protect environment and health by establishing sustainable waste water and solid waste management systems in every Bhutanese town.
- The Royal Centre for Disease Control (RCDC), Ministry of Health is responsible for testing water quality against the drinking water quality standards and its compliance is monitored by the DoW.

While a lot of water data are available from different agencies, there is no data sharing mechanism or system in place. This means that the data are not integrated and consistent, and there are issues in terms of data duplication and high data variability.

During the 13FYP, the DoW has proposed to carry out a national water resources inventory for the development of a Water Master Plan. Further, the data management and access to information on water resources and water related activities will be strengthened through establishment of centralized water data repository system and revival of water security index system.

The NCHM has initiated the development of a common online platform known as the Central Database Management System (CDMS) for compiling and sharing various processed and analysed hydrological and meteorological data (which may also be made available to the public in the future). The Centre also plans to complete a Freshwater lake inventory in the 13 FYP.

The Water and Sanitation Division (WSD) of MoIT maintains the Water and Sanitation Information System (WASIS) which includes water supply information for urban areas of Bhutan. However, the data input and update in the system are not robust at the moment.

In terms of water quality, the DECC ensures the safety of drinking water and DoPH issues the certification of water quality standards and the control of their compliance. However, data/information on water emissions are very limited, even though there are acts such as NEPA and the Water Act of Bhutan that mandate the collection of water emissions data. The only available data on water emissions are limited to project specific data collected as baseline water quality data and quality of drinking water. The Bhutan State of the Environment Report,

2022 includes information on the pollution of water and access to water resources, but that doesn't include detailed information on water emissions or provide full coverage of water emissions from various sources.

Another important aspect on water that is missing is information on groundwater in Bhutan. However, DoW has initiated a groundwater assessment at the pilot scale level which will be later scaled to cover detailed groundwater assessment as secondary water resources.

4.8. Biological Resources

The National Biodiversity Centre (NBC), under the MoAL, collects data on biological resources and biodiversity and animal genetic data (includes indigenous, hybrid and local animals – especially for domestic animals). It is the main agency that compiles and maintains database systems on biodiversity and ecosystems for the entire country which includes both domestic and wild species.

In the absence of a full ecosystem accounting, the NSB compile only basic information on biodiversity as included in its Annual Environment Accounts Report, and NSB does not account for biological or ecosystem resources.

Flora data are available for both the wild and domestic vegetation which includes cultivated, domesticated and species found in natural vegetation. The Centre also maintains a database on endemic or threatened species of floral species. These data are collected consistently every month mostly for floral species and genes of native animals by the Centre while most of the generic faunal species' data are mostly collected by DoFPS or Ugyen Wangchuck Institute for Forestry Research and Training (UWIFoRT).

As per provision for instituting mechanism for ecosystem services, green accounting (Chapter 3 article 47) mapping and monitoring of habitats and ecosystems is planned, as specified under Bhutan's NBSAP. This is under the mandate of the Department of Forests and Park Services as per the Forest and Nature Conservation Act, 2023, section 47 Payment for Ecosystem Services.

Data on the economic values of biological resources are available and the Centre is working on data collection and compilation for biological and ecosystem accounting of these resources. These data include information on various floral and faunal species and also ecosystem data such as on fragile watersheds, vegetated and cultivated lands, and nationally protected areas related to biological resources. The Centre also collects information on habitats and geographical coordinates of the places where the faunal species are found. These data are required since the RGOB has emphasized finding sustainable utilization of biological resources simultaneously serving as an opportunity for development and return of adequate benefits to the people and the country which is mandated in Bhutan Vision 2020.²⁵

While NBC is the main agency for the collection and compilation of data on biodiversity and biological resources, there exists a significant amount of relevant data that is collected by other government stakeholders. However, these data and information are not easily accessible

²⁵Nature conservation and biodiversity for poverty reduction – case of Bhutan, 2020.
<https://www.fao.org/3/ae537e/ae537e0n.htm>

mainly due to the lack of a common sharing platform, resulting in either duplication of efforts or underutilization of the existing data. Therefore, the Centre has developed a web-based biodiversity portal known as Biodiversity Information Management System (BIMS) to strengthen its information management. The Portal was subsequently upgraded to the status of a national biodiversity information clearinghouse in 2010 to provide access to data archiving, management and dissemination to all agencies collecting biodiversity-related data.

The NBC is the lead agency for preparation of the National Biodiversity Strategic Action Plans (NBSAP). NBC confirmed that NBSAP preparation in Bhutan will be according to SEEA EA requirements.

4.9. Air Emissions

The DECC under MoENR is responsible for monitoring and reporting of GHG emissions and pollution. The DECC collects and disseminates data for numerous climate change-related publications, such as the National Communications, Biannual Transparency Reports, State of the Environment Reports and more. Unfortunately, there is no online data-sharing platform currently available and all data are collected manually using different UNFCCC calculators, compiled, analyzed and reported. Data on GHG emissions (such as CO₂, CH₄, N₂O, traces of gases such as the group of F-gases²⁶) and particulate matter are available for few climate stations and are ultimately compiled and collected by DECC for analysis and publications. Overall, most of the source data required as input for SEEA air emission accounts are available with DECC.

As of 2023, the DECC is developing a cross-sectoral data-sharing mechanism known as the Bhutan Climate Portal (BCP) where the relevant agencies from energy, industries, transport, water, waste and other key areas will compile, upload and manage data in a common platform. The DECC also plans to integrate more thematic data into the BCP. However, this portal is not yet operational.

²⁶Bhutan: CO₂ Country Profile, 2023. <https://ourworldindata.org/co2/country/bhutan#>

5. Recommendations and priority accounts

Based on an analysis of the policy priorities and corresponding data needs, the current institutional landscape, and the results of the data assessment, several recommendations can be made for SEEA implementation in Bhutan. This section covers the following: 1) overarching recommendations that are not account or policy-specific; 2) specific recommendations on how to better connect SEEA accounts with the SDGs and FYPs in Bhutan; and 3) priority accounts, which are determined based on policy need and data availability, and which are specified according to time horizon (short term, medium term and long-term).

5.1. Overarching recommendations

A detailed programme of work on advancing the SEEA in Bhutan needs to be developed in coordination with relevant agencies and stakeholders. A national steering committee should be developed to provide guidance to the SEEA implementation process and serve as a two-way platform for the government, development partners and other stakeholders to connect as both data providers and users of the accounts. Including both data providers and users of the accounts in the national steering committee will ensure that NSB compiles SEEA accounts that respond to current policy questions and that high-quality data on the environment-economy nexus are used for policy making.

Specific thematic lead agencies and relevant agencies are also indicated in the subsequent section who will work with NSB in provision of SEEA related information in a timely fashion with good quality.

5.1.1. Institutional frameworks and data sharing

As part of the development of this national plan, relevant officials from different government agencies were nominated as National Task Force members. However, this Task Force is a temporary group meant to provide input and feedback on the national plan. Thus, there is a need to create a more permanent SEEA Technical Group with clear Terms of Reference (ToR) to guide the compilation of the accounts, as per the implementation plan, from a technical perspective. The members of the group should include key officials who have a role in the collection, compilation and production of statistics in their respective agencies. It is recommended that the NSB serve as the Secretariat, as they are responsible for the overall implementation of the SEEA in Bhutan.

The current lack of data-sharing mechanisms amongst NSB and line ministries in the short term can be addressed by instituting a SEEA Technical Group which will serve as a perfect forum to exchange of data and information among the relevant stakeholders. In the long term, the BSDS which is a comprehensive national database system for the management of administrative data should address and resolve most of the data-sharing challenges through system integration of relevant stakeholders.

5.1.2. Capacity building

Building capacity for both data providers and account users will be key to ensuring that high-quality accounts are both created and used. Some potential vehicles for capacity building are provided below. It is recommended that specific capacity building efforts be designed in

conjunction with the roll-out of priority accounts. The capacity building efforts can further be complemented by the development of manuals and national standards within the framework of international guidelines and standards.

E-learning to build technical capacity: There exist several publicly available, self-paced e-learning courses on the SEEA (provided by UNSD and UN SIAP), including specific courses on the SEEA CF, SEEA EA, energy accounts and water accounts.²⁷ In addition, UNSD and UN SIAP regularly run facilitated SEEA e-learning courses with lectures and question-and-answer sessions. As these courses are free of charge, stakeholders and others involved in the compilation of the accounts can use these courses as a low-cost way to build an understanding of the accounts. Taking e-learning courses alone is unlikely to be sufficient training, but is a useful tool/vehicle that can be undertaken in conjunction with other efforts. E-learning to build user awareness: It is important to build capacity amongst the user community as well. UNSD provides a “SEEA for Policy Makers” course, which is a non-technical introduction to how the SEEA can be used for biodiversity, climate change and finance/macroeconomic applications.

Workshops/in-person training and technical support: While e-learning courses can provide a good foundation, they are usually best used as an injunction with in-person activities. Workshops, in-person training and technical support are necessary to provide an opportunity for real-time learning, clarification of issues, and problem-solving on specific technical issues. Technical support is particularly helpful when it comes to actual compilation, as experts have a wealth of technical knowledge and experience that they can provide.

Specific trainings in this regard would involve training technical personnel on the conceptual framework of the SEEA, as well as hands-on training on how to link together different data sources to create the accounts in a robust, replicable way, following good data management practices.

Projects aimed to build capacity for the SEEA: While it is not ideal to rely on ad-hoc funding for capacity building, one-off projects and opportunities remain a useful way to build capacity and make progress on specific priority accounts. If a national steering committee is created, it is recommended that this committee aim to identify possible projects/funding opportunities to support the development of SEEA accounts in Bhutan. This may necessitate liaising with donor organizations and international organizations.

5.2. Opportunities to connect the SEEA, SDGs and FYPs

One of the main objectives of the SEEA is to eliminate data siloes, thereby increasing efficiency and providing policymakers with integrated information to design effective strategies and monitor progress toward achieving the SDGs. According to the UN Committee of Experts on Environmental-Economic Accounting (UNCEE), the SEEA can inform 40 indicators for nine SDGs.²⁸ However, at the moment, the SEEA is not used to monitor and report on SDGs in Bhutan.

²⁷<https://seea.un.org/content/seea-e-learning-resources>

²⁸UN Committee of Experts on Environmental-Economic Accounting, <https://seea.un.org/content/sustainable-development-goals>

Figure 4.1: following the convention used.



(Source: United Nations Statistics Division, seea.un.org/content/sustainable-development-goals)

NSB already compiles some accounts which could be used for national reporting of SDG indicators, namely the experimental physical energy flow account. Once the experimental physical energy flow account is improved, it should be used to report on the relevant SDGs, namely 1) SDG indicator 7.2.1, Renewable energy share in the total final energy consumption and 2) SDG indicator 7.3.1, Energy intensity measured in terms of primary energy and GDP. The DEWA has provided data for one indicator under Goal 7, the Proportion of the population with access to electricity. In addition, Goal 7 is a National Key Result Area (NKRA) of a previous FYP, which means that the SEEA energy account could be used for monitoring and reporting for both the SDGs and FYPs. However, DEWA has become unfunctional and there is no proper office to maintain its sustainability reviving its existence. Thus, it is recommended that DEWA should be revived in the first place and subsequently NSB include these indicators in their AEAS publications in the DEWA.

It is recommended that future compilation and dissemination plans target opportunities to connect the accounts to SDG and FYP reporting. All of the priority SEEA accounts in section 5.3 can be used to inform various aspects of the SDGs and many of them can be directly used for monitoring and reporting on indicators. In addition, multiple priority accounts can be used to monitor and report on SDG indicators as well as key performance indicators of the FYPs.

5.3. Priority accounts

The need for a range of SEEA accounts was identified through stakeholder consultations. However, given limited resources, a prioritization and timeline need to be put in place that balances the resource constraints, available data and potential of the specific accounts to inform policy. This section identifies priority accounts for Bhutan to pursue, categorized under three different timeframes – short, medium and long-term. It should be noted that the required data/steps and requirements are account-specific. In all cases, stronger data sharing remains a need.

Short-term priority accounts are those activities which can be picked up immediately in the next two years in the timeframe of 2024-2025.

Medium-term has been considered as the period between 2026-2028, in the next two – five years.

Long-term duration for the purpose for SEEA has been considered as the period from 2029-2032, in the next five – eight years.

The plans for respective time frame are in the following tables.

5.3.1. Short-term plans and requirements

For the short-term (2024-2025) Minerals; Energy, and Timber are prioritized which already have substantial information and system already. Furthermore, Land Resources and Air Emissions have been prioritized due to data availability and immediate reporting obligations.

Thematic areas	Goal, required data/steps, possible constraints	Lead and Relevant Agencies
Minerals	<p>Goal: Improved scope/coverage and quality of existing mineral asset accounts (physical and monetary)</p> <p>Required data/steps: Completion of a national survey for mineral deposits, including new deposits (develop mineral resources inventory)</p> <p>Integration of mineral data to BSDS.</p> <p>Possible constraints: Highly technical equipment and methods are needed for conducting the national survey</p>	DGM – followed by NSSC and NLCS)

Thematic areas	Goal, required data/steps, possible constraints	Lead and Relevant Agencies
<p>Energy</p>	<p>Goal: Increased scope/coverage and quality of existing physical energy flow accounts; work towards monetary asset accounts when feasible</p> <p>Required data/steps:</p> <ul style="list-style-type: none"> o Improved measures of energy supply from biomass o Improved measures of transportation by non-residents of Bhutan o Improved measures of energy stockpiles o Removing data duplication and errors, through the development of an online sharing mechanism and timely consultation meetings with relevant agencies o Integration of Energy data /publication to BSDS. <p>Possible constraints: Additional resources to collect currently unavailable data</p> <p>Other: Ideally, completed data on energy resources should be integrated from the data of relevant agencies (DoT and DoFPS) systematically and then made available under DoE (and integrated with the BSDS)</p>	<p>DoE, DoT, DoFPS</p>
<p>Timber and Forest Resources</p>	<p>Goal: Creation of timber and forest asset accounts, both physical and monetary</p> <p>Required data/steps:</p> <ul style="list-style-type: none"> o Regular updates of forest (timber) inventory for the entire country, including information to calculate additions/growth and removals/losses o Monetary accounts require information on timber available for harvest, as it forms the scope for monetary timber asset accounts o Monetary valuation will require information on timber prices and user costs or estimates of stumpage price o Link the FIRMS data to BSDS through a Data Base Application Programming Interface (DB-API). <p>Possible constraints: The NFIs contain a wealth of information but may not be updated regularly due to resource constraints.</p> <p>Other: Based on the information on the NFIs, it is also possible to compile carbon stock accounts.</p>	<p>DoFPS</p>

Thematic areas	Goal, required data/steps, possible constraints	Lead and Relevant Agencies
Land Resources	<p>Goal: Creation of land cover and use accounts resources accounts</p> <p>Required data/steps:</p> <ul style="list-style-type: none"> o Most of the data for land cover and use accounts is already available, though improvements in data quality and updates would facilitate the compilation of the accounts. These data are collected and updated as and when required. For instance, changes in the cadastral maps and other planning purpose information/data are updated in the geo-portal whenever there are alterations/information required for development purposes. <p>Possible constraints: Land cover and use accounts would require building knowledge of GIS systems by NSB and NLCS.</p> <p>Other: There are lot of other national initiatives such as the National Use Zoning (NUZ) exercise in Bhutan which will produce updated, accurate and coordinated land use/land cover data for planning purpose.</p>	NLCS
Air Emissions	<p>Goal: Creation of air emission accounts</p> <p>Required data/steps:</p> <ul style="list-style-type: none"> - Use existing data from air emission inventories (as reported to UNFCCC) and physical energy flow accounts to create SEEA air emission accounts, which provide information on emissions of GHGs and other pollutants by economic industry (consistent with the SNA) - Integration of the Bhutan Climate Portal to BSDS through an API <p>Possible constraints: Adequate data-sharing mechanisms are needed to ensure that NSB has access to the necessary source data.</p>	DoFPS, DECC, NCHM, DoT, DoI, DoPH, DoE, Bhutan Construction of Transport Authority - BCTA.

5.3.2. Medium-term plans and requirements

For the next two - five years, Water and, Biological resources have been selected.

Thematic Areas	Goal, required data/steps, possible constraints	Lead and Relevant Agencies
Water Resources	<p>Goal: Compilation of physical water flow and asset accounts Required data/steps:</p> <ul style="list-style-type: none"> o There is relatively good data on water resources at larger rivers, but better data on small sources (e.g., small rivers, streams, springs, groundwater, glaciers/ice/snow, etc.) is needed. o Water supply data from WASIS from MOIT needs to be updated and shared. o Data on water losses (Non-Revenue Water) would be advantageous, ideally covering illegal connections, leakages, etc o Integration of NCHM's CDBMS to BSDS could be explored. <p>Possible constraints: Additional resources to collect currently unavailable data; data on water losses (NRW) may be difficult to acquire.</p> <p>Other: References to past initiatives such as the ADB funded NIWRMP project needs to be maintained so that previous lessons learnt are included.</p>	DoW, NCHM, Department of Infrastructure Development, thromdes, municipalities)
Biological Resources	<p>Goal: Compilation of flora and fauna species, stock accounting for new species discovered and loss of existing species.</p> <p>Required data/steps: Time series data on natural flora and fauna species stock is needed Integration of BSDS to Biodiversity Information Management System (BIMS) would be ideal along with using information from NBSAB which will be as per SEEA requirements.</p> <p>Possible constraints: Data on natural biological resources are often scarce or have patchy coverage, particularly in terms of additions and losses (changes in biological resources stocks), no records of certain historical biodiversity data/information leading to data gaps; additional data/information on these resources would be required.</p> <p>Other: A new NBSAB is being developed in 2023 with a technical committee which will be aligned per SEEA framework.</p>	NBC and DoFPS

5.3.3. Long-term plans and requirements

In the next five - eight years for this initiative in 2029-2032, Soil Resources and Solid Waste accounting are listed.

Thematic Areas	Goal, required data/steps, possible constraints	Lead and Relevant Agencies
Soil Resources	<p>Goal: Creation of Soil resources accounts</p> <p>Required data/steps:</p> <ul style="list-style-type: none"> o For soil resource accounts, data on additions and reductions in stock for the top layers of soil is needed, including by soil type. o More soil data needs to be collected from different locations o Soil database needs to be setup with provision of digital update <p>Possible constraints: Soil study and use accounts would require building knowledge of GIS systems at NSSC and also high-end equipment for updates.</p> <p>Other: There is a specific lead agency (NCCS) for the theme in the country and all systems/ updates can be channelized.</p>	NSSC
Solid Waste	<p>Goal: Increased scope/coverage and quality of existing solid waste accounts and understand rate of reuse/recycling.</p> <p>Required data/steps: While there was a 2019 country-wide waste survey, additional data collection from waste collection entities was disrupted by COVID-19. Additional data collection, (particularly on waste treatment by economic sectors) and future iterations of the waste survey are needed to improve/continue the account.</p> <p>Possible constraints: Additional resources to collect currently unavailable data; difficulties in collecting data on unauthorized 'treatment' of waste by burning, composting or dumping.</p>	DECC, MOIT, thromdes, municipalities

6. Conclusion and Next Steps

In conclusion, strengthening SEEA implementation in Bhutan as outlined in this plan is imperative for effective environmental management and sustainable development. The prioritization of specific thematic areas aligns with the urgency and availability of data.

Immediate attention should be directed towards (i) Energy Resources, (ii) Mineral Resources, (iii) Timber and Forest Resources, (iv) Land Resources, and (v) Air Emissions in the short term.

The first three accounts already have information and are also being reported in the AEAS by the NSB. Air Emissions and Land Resources have been prioritized given that they can inform multilateral environmental agreements and because the source data are already available and would require less resources to compile (i.e. GHG inventories, land cover data). At the same time, all of these areas require not only data updates but also the establishment of robust data sharing mechanisms.

Moving into the medium-term, (i) Water Resources, and (ii) Biological Resources are selected for implementation. On the other hand, (i) Soil Resources, and (ii) Solid Waste are domains that can be brought under accounting in the long term.

While data exists for these domains, streamlining data collection, compilation, and dissemination will be crucial for their effective integration into the SEEA. For most themes where there are data available, it will be necessary to review the formats, update and integrate them through to enable seamless data sharing effectively and efficiently.

The achievement of environmental accounting in Bhutan is contingent on being able to build capacity and achieve a critical mass of officials with the required capacities in environmental accounting—both in terms of its production and use. This will ensure that agencies are well-equipped to handle data collection, management, and sharing efficiently. Furthermore, as short-term achievements are realized, swift action should be taken to sustain the momentum in collecting and maintaining data consistently, as well as using the produced accounts for monitoring and reporting on the environment.

Overall, the systematic enhancement of Bhutan's SEEA accounts will not only contribute to informed policy decisions but also reinforce the nation's commitment to environmental stewardship and sustainable development.