



Natural Resources Accounts

Forest and Ecosystem



June 2025



Strengthening Environment, Climate Change
and Disaster Statistics (ECDS) Project
Bangladesh Bureau of Statistics
Statistics and Informatics Division
Ministry of Planning
Government of the People's Republic of Bangladesh



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Prepared by

Strengthening Environment, Climate Change and Disaster Statistics (ECDS) Project
Bangladesh Bureau of Statistics

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Graphics Design: Publication Section, FA & MIS Wing, BBS

ISBN-978-984-475-371-6

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Director General

Bangladesh Bureau of Statistics

Preface

Bangladesh Bureau of Statistics (BBS) has developed the Natural Resource Accounts (NRA) Forest and Ecosystem Accounts for the first time, in accordance with the United Nations System of Environmental-Economic Accounting (SEEA) framework. This report classifies forest resources based on SEEA standards and presents detailed data on forest area, changes in forest cover, and the use of forest land over time. It also includes information on different types of ecosystems and their conditions, contributing to a comprehensive understanding of forest and ecosystem dynamics in Bangladesh.

This report is vital for promoting sustainable forest management, biodiversity conservation, and informed policy development. It enables decision-makers to monitor deforestation, assess ecosystem health, and align forest-related strategies with national and international commitments, including the Sustainable Development Goals (SDGs). By integrating environmental and economic data, the report supports long-term planning for climate resilience, conservation efforts, and natural resource governance.

Sincere thanks to the Secretary of the Statistics and Informatics Division (SID) for the invaluable support and encouragement in ensuring the systematic and timely completion of this publication. I extend my heartfelt appreciation to the ECDS Team, led by the Project Director, for their active coordination for preparation of this report. I believe that the publication will excite feelings and passions with strong interest regarding environment related statistics among policy-makers, researchers, academics, students and other stakeholders.

Any suggestions and recommendations for further improvement of this publication would be highly appreciated.

Dhaka
June 2025

Mohammed Mizanur Rahman



Project Director
ECDS Project
Bangladesh Bureau of Statistics

Acknowledgement

This Baseline Report on Natural Resource Accounts (NRA) for Forests and Ecosystems follows the UN System of Environmental-Economic Accounting (UN-SEEA) framework. Its objective is to explore the use of SEEA methodology, identify data gaps, and support the development of comprehensive accounts of natural resources, their changes over time, and their contributions to the economy and society. The report is expected to promote deeper research and monitoring of environmental issues and resource depletion at the grassroots level. I believe its findings will generate strong interest to the stakeholders.

My sincere thanks and deep appreciation to the Secretary of the Statistics and Informatics Division, Ministry of Planning, for the guidance in ensuring the timely publication of this report.

I am indeed grateful to Mr. Mohammed Mizanur Rahman, Director General of BBS, for his wise guidance throughout the accounting process and for his wholehearted support in the preparation of this report.

It would be an injustice to them if I did not mention the advice I received at various stages of the project from Dr. A K Enamul Haque, Director General, Bangladesh Institute of Development Studies (BIDS) which enabled me to achieve the goals. Special thanks are due to Mr. Md. Rafiqul Islam, Director, National Accounting Wing and Mr. Md. Nazmul Hoque, Deputy Director of BBS for their contribution to enrich this publication. I am indeed grateful to the ECDS team of BBS and other relevant committee members for their efforts to ensure the quality of this publication.

Comments and suggestions for further improvement of this Publication will be highly appreciated.

Dhaka
June 2025


Mohammad Saddam Hossain Khan

Acronyms

ADP	Annual Development Program
APD	Assistant Project Director
BBS	Bangladesh Bureau of Statistics
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BIDS	Bangladesh Institute Development Studies
CF	Central Framework
DDG	Deputy Director General
DG	Deputy Director General
EA	Ecosystem Accounting
EA	Environmental Assessment
ECDS	Environment Climate Change and Disaster Statistics
EIA	Environmental Impact Assessment
GHG	Greenhouse Gas
GIS	Geographic Information System
NAP	National Adaptation Plan
NCA	Natural Capital Accounts
NDCs	Nationally Determined Contributions
NGO	Non-Government Organization
NRA	Natural Resources Accounts
NSDS	National Strategy for Development of Statistics
PSC	Project Steering Committee
PTC	Project Technical Committee
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDGs	Sustainable Development Goals
SEEA	System of Environmental Economic Accounting
SID	Statistics and Informatics Division
UN	United Nations
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
UNSD	United Nations Statistics Division

Executive Summary

Executive Summary

Forests and ecosystems play a vital role in supporting people's livelihoods, serving as major sources of timber, traditional medicine, fuelwood, food, and building materials. They are also essential components of the carbon and hydrological cycles, contribute to watershed and soil conservation, and help prevent soil erosion. As such, forests and ecosystems are closely linked to a nation's economic growth and overall well-being. Despite their importance, the economic value of forest resources and their broader contributions are often underestimated or insufficiently documented. To address this gap, the development of forest and ecosystem accounts aims to provide a comprehensive assessment of these resources, ensuring their value is fully recognized and integrated into national planning and decision-making processes.

This is the first set of forest and ecosystem accounts developed for Bangladesh, covering the period from 2015 to 2023. The forest accounts are prepared in accordance with the System of Environmental Economic Accounting (SEEA) framework. Compiled using a range of data sources, these accounts present the flows of forest resources from the environment into the economy. The effective utilization of this resource will enable accurate assessment of forest resources and informed policy-making.

The physical asset accounts for forests and other wooded land in Bangladesh, covering the years 2015 to 2023, detail the changes in three main categories: (i) Other naturally regenerated forests including bamboo forests, hill forests, sal forests, swamp forests, and mangrove forests; (ii) Planted forests including forest plantations, swamp plantations, and mangrove plantations and (iii) Other wooded land including Shrub-covered areas. These categories represent the initial set of forest products included in the first publication of the forest accounts. However, several important aspects of forest resource use were not addressed in this initial publication. These include timber resources and their corresponding monetary asset accounts, as well as the contributions of forests to tourism, carbon sequestration, biodiversity conservation, ecosystem services, and water

নির্বাহী সারসংক্ষেপ

বন ও বাস্তুতন্ত্র মানুষের জীবিকা ও জীবনধারার জন্য অত্যন্ত গুরুত্বপূর্ণ। এগুলো কাঠ, জালানি, খাদ্য, ঐতিহ্যবাহী ও শুধু এবং নির্মাণ সামগ্রীর গুরুত্বপূর্ণ উৎস হিসেবে কাজ করে। পাশাপাশি, কার্বন ও জলচক্রের ভারসাম্য রক্ষা, জলাধার ও মাটি সংরক্ষণ এবং মাটির ক্ষয় রোধেও বন গুরুত্বপূর্ণ ভূমিকা পালন করে। ফলে, একটি দেশের অর্থনৈতিক উন্নয়ন ও জনগণের সামগ্রিক কল্যাণের সঙ্গে বন ও বাস্তুতন্ত্রের অবদান নিবিড়ভাবে জড়িত। তবে, এদের এমন বহুবৈ অবদান থাকা সত্ত্বেও, বনসম্পদের প্রকৃত অর্থনৈতিক মূল্য প্রায়ই অবমূল্যায়িত হয় কিংবা যথাযথভাবে নথিভুক্ত হয় না। এই ঘাটতি দূর করতেই বন ও বাস্তুতন্ত্রের হিসাব প্রণয়নের উদ্যোগ নেওয়া হয়েছে। এর মূল লক্ষ্য হলো এই প্রাকৃতিক সম্পদগুলোর সামগ্রিক মূল্যায়ন নিশ্চিত করা, যাতে এগুলোর প্রকৃত গুরুত্ব জাতীয় পরিকল্পনা ও নীতিনির্ধারণ প্রক্রিয়ায় সঠিকভাবে প্রতিফলিত হয়।

এটি বাংলাদেশের জন্য প্রণীত প্রথম বন ও বাস্তুতন্ত্রের একাউন্ট, যা ২০১৫ থেকে ২০২৩ সাল পর্যন্ত সময়কালকে অন্তর্ভুক্ত করেছে। এই একাউন্টসগুলি সিষ্টেম অব ইনভায়রনমেন্টাল ইকোনোমিক একাউন্টিং (SEEA) এর কাঠামো অনুযায়ী প্রস্তুত করা হয়েছে। বিভিন্ন উৎস থেকে সংগ্রহ করা তথ্যের ভিত্তিতে সংকলিত এই হিসাবগুলো বনসম্পদের পরিবেশ থেকে অর্থনীতিতে প্রবাহ এবং তাদের ব্যবহার ও রূপান্তরকে দৃশ্যমান করে। এর মাধ্যমে বনসম্পদের সঠিক মূল্যায়ন এবং নীতিনির্ধারণে এ সম্পদের কার্যকরী ব্যবহার সম্ভব হবে।

২০১৫ থেকে ২০২৩ সাল পর্যন্ত দেশের বন ও অন্যান্য বনভূমির জন্য প্রস্তুত ভৌত সম্পদের হিসাব মূলত তিনটি প্রধান ভাগে পরিবর্তনের ব্যবস্থা করা হয় যার বিস্তারিত চিত্র তুলে ধরা হলো। (i) অন্যান্য প্রাকৃতিকভাবে পুনরুজ্জীবিত বন যেমন বাঁশ বন, পাহাড়ি বন, শাল বন, জলাভূমি সংলগ্ন বন এবং ম্যানগ্রোভ বন; (ii) রোপিত বন, যার মধ্যে রয়েছে বন রোপণ, জলাভূমি প্রস্তুত এবং ম্যানগ্রোভ রোপণ এবং (iii) অন্যান্য বৃক্ষ আচ্ছাদিত ভূমি, যার মধ্যে ঝোপঝাড় আচ্ছাদিত এলাকা অন্তর্ভুক্ত। এই ক্যাটাগরিসমূহে বন বিভাগ কর্তৃক প্রকাশিত প্রথম প্রকাশনায় অন্তর্ভুক্ত প্রাথমিক বনজ পণ্যের প্রতিনিধিত্ব করে। তবে, এই বনসম্পদ ব্যবহারের কয়েকটি গুরুত্বপূর্ণ দিক অন্তর্ভুক্ত করা সম্ভব হয়নি। এর মধ্যে রয়েছে কাঠসম্পদ ও সংশ্লিষ্ট আর্থিক সম্পদের হিসাব, পাশাপাশি পর্যটন, কার্বন শোষণ, জীববৈচিত্র্য সংরক্ষণ, বাস্তুতন্ত্র পরিমেবা এবং জল ব্যবস্থাপনা ও সরবরাহে বনভূমির অবদান। ভবিষ্যতে বন বিভাগের দ্বিতীয় সংস্করণে এই গুরুত্বপূর্ণ

supply. These elements may be incorporated in the second edition of the forest accounts. Additionally, the publication provides a foundational overview of ecosystem accounting in the context of Bangladesh.

The forest accounts reveal several key trends in forest land use over the period from 2015 to 2023. Overall, the total area of forest and other wooded land has declined from 18499.08 sq. km in 2015 to 17498.18 sq. km in 2023, marking an overall decrease of approximately 5.41%. In contrast, there has been a 27.36% increase in the area of planted forests though other naturally regenerated forests and other wooded land area decrease 1.39% and 19.86% respectively between the same period.

The forest accounts highlight several critical policy issues that are particularly relevant to sustainable forest management in Bangladesh. One key area is the promotion of sustainable forest practices through forest certification systems, which can help ensure that forest resources are harvested responsibly and managed in accordance with environmental and social standards. In the context of Bangladesh, where forests such as the Sundarbans and the hill forests of the Chittagong Hill Tracts are ecologically sensitive, implementing forest certification can enhance accountability and attract environmentally conscious investment.

Water catchment management and the protection of groundwater recharge systems also emerge as urgent priorities. Many forested regions in Bangladesh serve as vital water catchment areas that regulate local hydrology and reduce the risk of floods and droughts. Effective management of these areas are essential not only for water security but also preserving ecosystem services that benefit both rural and urban communities.

The formulation and implementation of comprehensive forest management plans is another critical area of concern. These plans should emphasize biodiversity conservation, particularly in light of the country's rich but increasingly threatened flora and fauna. Forest management strategies must also support the

উপাদানগুলো সংযোজন করা যেতে পারে। এছাড়াও, এই প্রকাশনাটি বাংলাদেশের প্রেক্ষাপটে বাস্তুতন্ত্রের হিসাবরক্ষণের একটি প্রাথমিক ও মৌলিক সারসংক্ষেপ প্রদান করে, যা ভবিষ্যৎ পরিকল্পনা ও নীতিনির্ধারণে সহায়ক হতে পারে।

বন একাউন্টস ২০১৫ থেকে ২০২৩ সাল পর্যন্ত মেয়াদে বনভূমি ব্যবহারে বেশ কিছু গুরুত্বপূর্ণ প্রবণতা তুলে ধরে। সামগ্রিকভাবে, বন এবং অন্যান্য বনভূমির মোট আয়তন ২০১৫ সালের ১৮৪৯৯.০৮ বর্গকিলোমিটার থেকে হাস পেয়ে ২০২৩ সালে ১৭৪৯৮.১৮ বর্গকিলোমিটারে দাঁড়িয়েছে, যা প্রায় ৫.৪১ % হাস নির্দেশ করে। অন্যদিকে, প্রাকৃতিকভাবে পুনরুজ্জীবিত বনভূমির ক্ষেত্রে প্রায় ২৭.৩৬% বৃক্ষ পরিলক্ষিত হয়েছে, যার মধ্যে বৌশ বন, পাহাড়ি বন, শাল বন, জলাভূমি বন এবং ম্যানগ্রোভ বন অন্তর্ভুক্ত। একই সময়ের মধ্যে প্রাকৃতিকভাবে পুনরুজ্জীবিত বন এবং অন্যান্য বনভূমি যথাক্রমে ১.৩৯% এবং ১৯.৮৬% হাস পেয়েছে।

বন একাউন্টস মূলত বাংলাদেশের টেকসই বন ব্যবস্থাপনার ক্ষেত্রে বিশেষভাবে প্রাসঙ্গিক কয়েকটি গুরুত্বপূর্ণ নীতিগত বিষয় তুলে ধরে। এর একটি গুরুত্বপূর্ণ দিক হলো বন সার্টিফিকেশন ব্যবস্থার মাধ্যমে টেকসই বন ব্যবস্থাপনা পদ্ধতির উন্নয়ন ও প্রসার, যা পরিবেশ ও সামাজিক মানদণ্ড অনুসরণ করে বনসম্পদ দায়িত্বশীলভাবে আহরণ ও ব্যবস্থাপনার ক্ষেত্রে সহায়ক হতে পারে। বাংলাদেশের প্রেক্ষাপটে, যেখানে সুন্দরবন ও পার্বত্য চট্টগ্রামের পাহাড়ি বনাঞ্চল পরিবেশগতভাবে অত্যন্ত সংবেদনশীল, সেখানে বন সার্টিফিকেশন কার্যকরভাবে জোবাবদিহিতা নিশ্চিত করতে পারে। একইসঙ্গে, এটি পরিবেশবান্ধব বিনিয়োগ আকর্ষণে গুরুত্বপূর্ণ ভূমিকা রাখতে পারে।

জলাধার ব্যবস্থাপনা এবং ভূগর্ভস্থ জল পুনর্ভরণ ব্যবস্থার সুরক্ষাও একটি গুরুত্বপূর্ণ অগ্রাধিকার হিসেবে চিহ্নিত হয়েছে। বাংলাদেশের অনেক বনাঞ্চল গুরুত্বপূর্ণ জলাধার অঞ্চলের ভূমিকা পালন করে, যা স্থানীয় জলচক্র নিয়ন্ত্রণে সহায়তা করে এবং বন্যা ও খরার ঝুঁকি কমায়। এই অঞ্চলগুলোর সঠিক ও কার্যকর ব্যবস্থাপনা কেবল পানি সুরক্ষার জন্যই নয়, বরং গ্রামীণ ও শহরাঞ্চলের জনগণের জন্য উপকারী বাস্তুতন্ত্র পরিমেৰা রক্ষার ক্ষেত্রেও অত্যন্ত গুরুত্বপূর্ণ।

বিস্তৃত বন ব্যবস্থাপনা পরিকল্পনা প্রণয়ন ও কার্যকর বাস্তবায়ন একটি গুরুত্বপূর্ণ নীতিগত অগ্রাধিকার। এসব পরিকল্পনায় জীববৈচিত্র্য সংরক্ষণের ওপর বিশেষ গুরুত্ব দেওয়া প্রয়োজন, বিশেষ করে দেশের সমৃদ্ধ অর্থচ দিন দিন হমকির মুখে পড়া উদ্দিদ ও প্রাণীর প্রেক্ষাপটে। বন ব্যবস্থাপনার কৌশলসমূহকে

restoration of degraded forests, expansion of green cover, and the integration of climate resilience measures.

Additionally, the forest sector offers significant economic opportunities that require stronger policy support. One such opportunity is the sustainable production and commercialization of non-timber forest products, such as liquid honey and beeswax, which are especially viable in the Sundarbans and other forested wetlands. With proper training, market access, and regulatory backing, these products can enhance livelihoods while reducing pressure on timber resources.

Lastly, the overexploitation of wood biomass for household energy use remains a pressing issue in Bangladesh, particularly in rural and forest-adjacent communities. This unsustainable practice contributes to deforestation and environmental degradation. Policies promoting alternative energy sources, improved cookstoves, and community-based forest management are essential to reducing reliance on wood biomass and ensuring long-term forest sustainability. Moving forward, efforts are needed to institutionalize the production and use of forest accounts in government decision-making. This will require ongoing collaboration among government agencies, along with technical and financial support from development partners.

এমনভাবে তৈরি করতে হবে যাতে অবক্ষয়প্রাপ্ত বন পুনরুদ্ধার, সবুজ আচ্ছাদন বৃদ্ধি এবং জলবায়ু সহনশীল ব্যবস্থা একত্রে অন্তর্ভুক্ত হয়।

অধিকস্তু, বন খাত উল্লেখযোগ্য অর্থনৈতিক সম্ভাবনা সৃষ্টি করে, যার বাস্তবায়নের জন্য শক্তিশালী নীতিগত সহায়তা প্রয়োজন। এমনই একটি সম্ভাবনা হলো তরল মধু ও মৌমাছির মোমের মতো কাঠ-বহির্ভূত বনজ পণ্যের টেকসই উৎপাদন ও বাণিজ্যিকীকরণ, যা বিশেষত সুন্দরবন ও অন্যান্য বনজ জলাভূমিতে কার্যকরভাবে প্রয়োগযোগ্য। যথাযথ প্রশিক্ষণ, বাজারে প্রবেশাধিকার এবং সুস্থু নীতিগত সহায়তার মাধ্যমে এই পণ্যগুলো স্থানীয় জনগণের জীবিকা উন্নয়নে গুরুত্বপূর্ণ ভূমিকা রাখতে পারে। একইসঙ্গে, এটি কাঠের ওপর অতিরিক্ত নির্ভরতা করাতে সহায়ক হতে পারে।

পরিশেষে, বাংলাদেশে বিশেষ করে গ্রামীণ ও বন-সংলগ্ন এলাকায় গৃহস্থালির জালানি হিসেবে কাঠজাত জৈববস্তুর অতিরিক্ত ব্যবহার একটি গুরুত্বপূর্ণ সমস্যা হিসেবে রয়ে গেছে। এই অস্থিতিশীল ব্যবহার বন উজাড় এবং পরিবেশগত অবক্ষয়ের জন্য দায়ী। দীর্ঘমেয়াদে বনসম্পদের টেকসইতা নিশ্চিত করতে ও কাঠের উপর নির্ভরতা করাতে বিকল্প জালানি, উন্নত চুলা এবং সম্প্রদায়ভিত্তিক বন ব্যবস্থাপনা প্রচারের জন্য কার্যকর নীতি গ্রহণ জরুরি। এগিয়ে যেতে হলে সরকারি সিদ্ধান্ত গ্রহণ প্রক্রিয়ায় বন অ্যাকাউন্টের উৎপাদন ও ব্যবহারের প্রাতিষ্ঠানিকীকরণ প্রয়োজন। এর জন্য সরকারি সংস্থাগুলোর মধ্যে সমন্বিত সহযোগিতা এবং উন্নয়ন অংশীদারদের প্রযুক্তিগত ও আর্থিক সহায়তা অপরিহার্য।

Chapter I

Introduction

Chapter I

Introduction

1.1 Background

The geography and climate have made the country vulnerable to different meteorological, hydrological and geological hazards. These hazards often lead to disasters and the major ones in the country are floods, cyclones, droughts, tidal surges, tornadoes, earthquakes, river erosion, infrastructure collapse, water logging, water and soil salinity, epidemic, and various forms of pollution etc. Changes in the climate is a reality and is happening mainly due to greenhouse gas emission and rise in the surface air temperature of the earth. Climate Change and its impacts are the burning issue in the world.

Himalayan range to the north, the Bay of Bengal to the south with its funnelling towards Meghna estuary and the vast stretch of Indian land to the west of the country. It's a low-lying country with 405 rivers and it's the largest delta in the World formed by the mighty rivers namely the Padma (the Ganges), the Brahmaputra, the Jamuna, the Meghna etc.

The constitution of Bangladesh in its 18(A) clause states that the State shall endeavour to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetlands, forests and wild life for the present and future citizens.

Thus, it highlights the importance of protection and improvement of environment and biodiversity for the benefit of its citizens. Similarly, the Wildlife (Conservation and Security) Act 2012, which was enacted by the present government aims to protect the biodiversity, wildlife, and forests of the country. It provides provisions for establishing sanctuaries, national parks, and community conservation areas, as well as defining the permissible activities within these areas. An admirable feature of this Act is its recognition of national heritage, memorial trees, and sacred trees, while also respecting the traditional and cultural values of the communities. This is a significant stride towards acknowledging and upholding the rights of indigenous communities.

In 2017, the Bangladesh Biodiversity Act (2017), was passed in line with Bangladesh's constitutional mandate under Article 18A and international mandates under Convention on Biodiversity to regulate and ensure conservation of biodiversity in Bangladesh. In addition to the aforementioned Acts, there are several other laws that indirectly tackle environmental issues.

Given this background, it has been of keen interest to the Government to understand the contribution of the forest and ecosystem to the economy and to determine where such natural resources are managed sustainably so that the constitutional obligations of the government is upheld and the interest of the future generations are upheld.

Based on this commitment and the international obligations of the government of Bangladesh towards SDGs, the Bangladesh Bureau of Statistics has developed a project to undertake the Natural Resource Accounting (NRA) activities in Bangladesh. The objective of the assignment is to explore possibilities of NRA using UNSEEA methodology and to understand the data and research gaps that exists towards completing a full account of natural resources, its changes over time and to measures their contribution to the economy.

Natural Resource Accounts (NRA) is a process of measuring the value of natural resources and their services. It is a tool that can be used to understand the economic value of nature, and to inform policy decisions about sustainable development.

We are preparing the Forest and Ecosystem Accounts to ensure the valuation of these resources. Economic valuation of forest ecosystem services is crucial for sustainable forest management and policy-making at all levels, recognizing forests both as natural capital and for their socio-economic benefitsⁱ.

1.2 Vision of NRA/NCA

To gather or provide data and information on the condition of natural resources using geospatial techniques (Remote Sensing, GIS, and GOs) and to build a gateway for disseminating Natural Resource/Capital Accounts (NRA/NCA) Statistics in collaborative ways so that appropriate policies and interventions would be adopted to safeguard them as well as ensure the Management of Sustainable Development in a holistic approach.

1.3 Mission

- To develop an integrated, professional, efficient and effective roadmap on NRA/NCA under the guidance and leadership of BBS, in order to sustainable management and protection of natural resources;
- To administer the quality of environmental data and information to ensure a healthy sustainable environment that is essential in the context of nurturing, understanding and harnessing for the benefit of present and future generations;
- To provide data and information support to apply integrated, innovative and coherent approaches in developing and implementing policies, laws, plans and budgets on poverty eradication;
- To develop a sound, authentic, timeliness environmental database to support the Governments on designing clean environments e.g., land use, preserve forest, ecosystem, water use efficiency, water withdrawal, waste management, air, water and soil pollution, energy solutions-renewable energy, energy efficiency, smart energy distribution etc. that are in the social and economic interest of its people; and
- To define the time frame and design working arrangements to implement the roadmap within the time frame.

1.4 Importance

The NRA/NCA in Bangladesh will provide information on the state of natural resources and the changes affecting them. The NRA/NCA is one of the tools which may be used to support environmental policy, alongside instruments such as environmental impact assessments at a project level, integrated environmental and economic analyses for policy work at the sectoral and macro-economic levels, and public investment/ expenditure reviewsⁱⁱ. In general, the NRA/NCA will create a bridge between the environment and the economy. In Bangladesh, NRA can be used for:

1. It will create the opportunity on the way of thinking for demonstrating the accountability in managerial perspective and protection of natural resources;
2. It will identify present and future environmental problems such as resource depletion, generating unsustainable waste, loss of biodiversity, overfishing;

3. NRA/NCA will help for analysing government plan and policy, undertaking resource management and decision-making to monitor sustainable development and country's national strategic plans;
4. It will draw up macro-economic indicators for environmental performance or prosperity; and
5. It will improve the benchmarks for measuring a country's national resource and economy.

1.5 Policy Evidence

Accumulation of natural resources (capitals) of the surrounding environment and developing the linkage between these resources and economy is now essential for the country like Bangladesh as the country is occupied by diversified geographical features and natural assets. Though this concept is very new for the country but government has already introduced it in the country's strategic plan.

NRA/NCA will ensure a sound database that would help policy makers to understand the potential impact of their decisions. In the National Strategic plan of Bangladesh like the 8th five-year plan, Perspective Plan 2041 and Delta plan , it is emphasized to provide necessary, relevant and timely data on natural resources. It is mentioned in the 8th Five-year plan, in terms of specific activities to improve green growth that the BBS will generate physical statistics about the stock of natural resources and their changes over time. This also entails calculating the monetary costs of losing natural resources. In addition, in the National Strategy of Development of Statistics (NSDS) it is noted in the context of strategic actions that BBS will develop the Compilation of the Natural Resource Accounts.

The NRA/NCA will make a strong interrelation between economy and environment- such as quantifies the nonrenewal damage to the environmental resources and assists in determination of development in real terms. Furthermore, NRA/NCA has deep inter-linkages with the SDGs as 9 out of the 17 goals directly relation to management of natural resources and their accounting. Besides fulfilling the SDGs, Bangladesh government has the international commitments to develop NRA/NCA that would also ensure this nation to become a part of the group of elite countries in generating Asset Accounts.

The UN General Assembly resolution titled, "Transforming our world; the 2030 agenda for sustainable development which got the approval of more than 190 countries, requires the preparation of Natural Resource Accounts. Bangladesh is a signatory to this resolution. The UN, in 2012, adopted the System of Economic and Environmental Accounting (SEEA). It is the latest internationally accepted framework for NRA/NCA. It is an umbrella term covering efforts to make use of an accounting framework to provide a systematic way to measure and report on stocks and flows of natural resources/capitalsⁱⁱⁱ.

1.6 Linkage of International Communities

United Nations Environment Programme, United Nations Statistical Division, Organization of Economic Cooperation and Development (OECD), World Bank, World Resource Institute (WRI), Statistical Office of the European Communities (EUROSTAT) and Worldwide Fund for Nature (WWF).

Chapter II

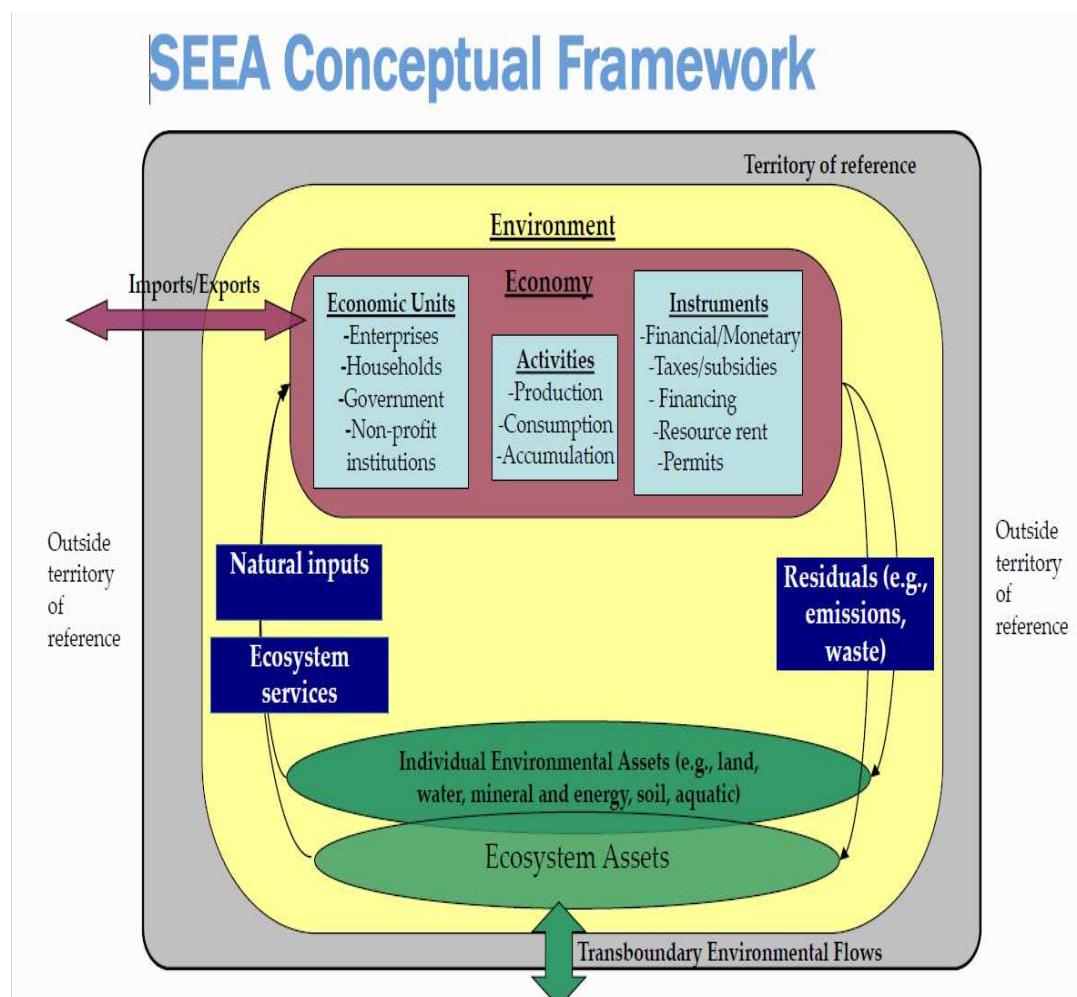
Concepts and Definitions

Chapter II

Concepts and Definitions

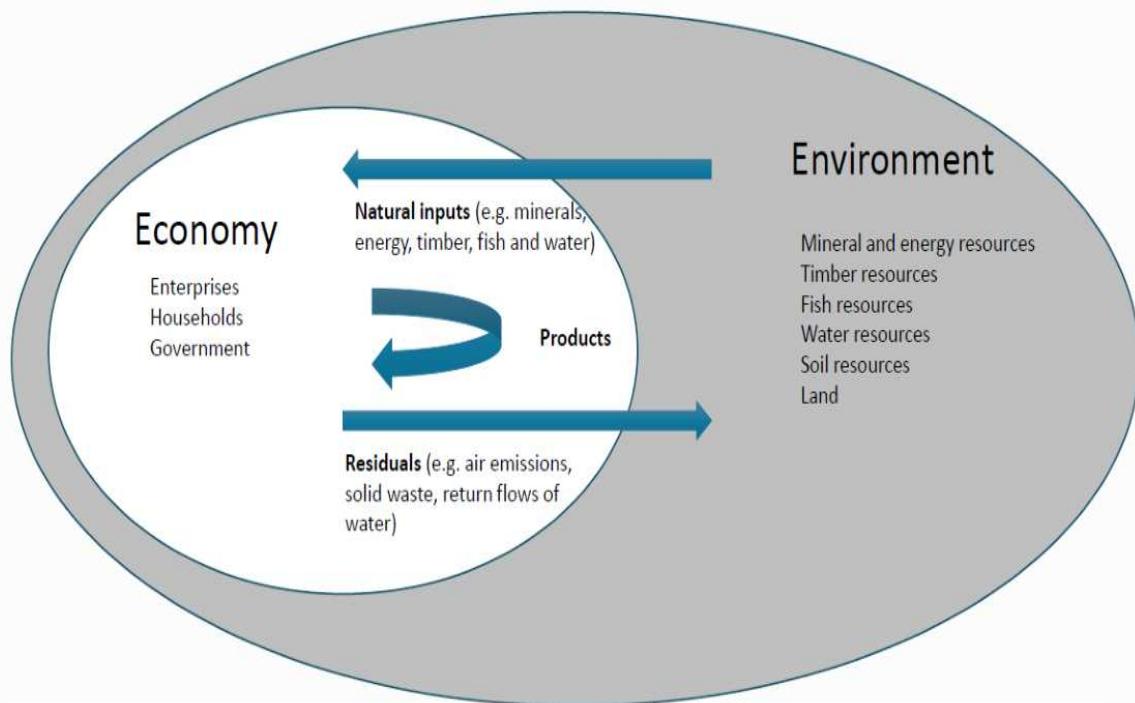
2.1 The System of Environmental-Economic Accounting (SEEA)

In practice, NRA/NCA structure includes the compilation of physical supply and use tables, functional accounts and asset accounts for natural resources like water and wetland, ocean (blue economy), land and soil, forest, ecosystem, energy, fisheries, waste, air emission (GHG), disaster expenditure etc. The integration of information concerning the economy and the environment requires an interdisciplinary approach. The System of Environmental-Economic Accounting (SEEA) CF brings together, in a single measurement system. Each of these areas has specific and detailed measurement approaches that are integrated in the SEEA CF to provide a comprehensive as a holistic view^{iv}. The concepts and definitions that comprise the SEEA CF are designed to be applicable across all countries, regardless of their level of economic and statistical development, their economic structure, or the composition of their environment^v. The SEEA CF will be accompanied by two related parts 1) SEEA Ecosystem Accounts, and 2) SEEA Extensions and Applications.



Physical Flow Accounts: Physical flow accounts track the extraction, use, and disposal of environmental resources. These accounts quantify the flows of natural resources from the environment to the economy, such as energy and water extraction, as well as emissions and waste generated by economic activities^{vi}.

Physical Flows in the SEEA



Asset Accounts: Asset accounts capture changes in the stock of natural resources over time. They provide information on the availability, condition, and value of environmental assets, including land, forests, fisheries, and minerals. By valuing these assets, the SEEA enables policymakers to assess their contribution to national wealth and economic development.

Monetary Accounts: Monetary accounts assign economic values to environmental resources and their services. They quantify the economic benefits derived from ecosystem services, such as pollination, water purification, and climate regulation. By incorporating these values into economic indicators, such as GDP, policymakers gain insights into the true costs and benefits of economic activities.

Environmental-Economic Extensions: The SEEA CF facilitates the integration of environmental and economic data with other analytical tools. This includes the use of input-output analysis to understand the environmental footprints of different industries and the application of environmentally-adjusted macroeconomic models for policy simulations.

The SEEA plays a crucial role in informing policy decisions and fostering sustainable development. Its integrated approach provides policymakers with a comprehensive understanding of the environmental and economic implications of different policy options. By quantifying the value of natural resources and ecosystem services, the SEEA enables the development of policies that internalize environmental costs and promote more sustainable resource management.

The SEEA serves as a valuable framework for integrated analysis, enabling policymakers to make informed decisions that balance economic development with environmental sustainability. By accounting for the environment and its resources, the SEEA provides a comprehensive understanding

of the interactions between the economy and the environment. Its standardized approach enhances comparability across countries and facilitates the monitoring of sustainable development progress. The SEEA continues to evolve, guiding policymakers in addressing complex environmental challenges and promoting a more sustainable and resilient nations in future.

Valuation of Natural Assets: In the stock account, value of land resources needs to be assessed. The monetary asset account can be determined by multiplying the physical asset account with the unit rent. In the case of land resources, the Net Present Value (NPV) method is utilized to calculate the rent units. NPV involves^{vii} evaluating the value of resources by considering their price as a proxy for future sales value of land without taxes/subsidies. Such values play critical roles in use of these resources. In this case, classification of land is important.

The NPV is calculated using the following formula

$$NPV = \sum_i^T \frac{P_i Q_i}{(1+d)^i}$$

Where, i is the year, T is the time horizon used for the valuation purpose, P is the price of annual output (goods/services) produced on the land, and Q is the quantity of the produced goods and services.

Using the NPV from the above equation, it is possible to calculate the rent units using the following equation.

$$\text{Unit Rent} = \frac{NPV}{\text{Economic Life}}$$

2.2 The System of Environmental Economic Accounting-Experimental Ecosystem Accounting (SEEA-EEA)

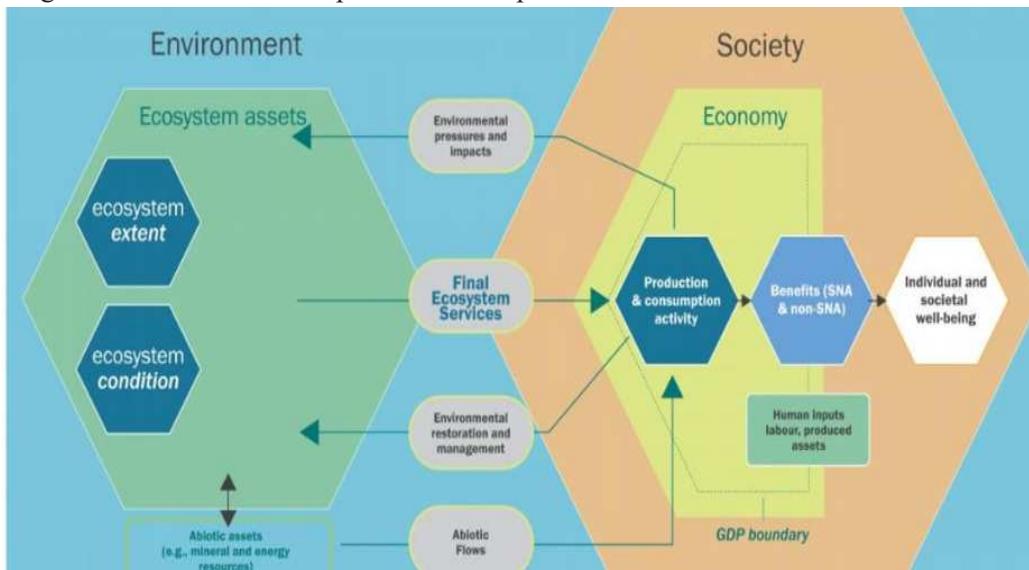
SEEA EEA is a spatially-based, integrated statistical framework for organizing biophysical information about ecosystems, measuring ecosystem services, tracking changes in ecosystem extent and condition, valuing ecosystem services and assets and linking this information to measures of economic and human activity^{viii}. Ecosystem Accounting was developed by a multidisciplinary group of experts to respond to a range of policy demands and challenges with a focus on making visible the contributions of nature to the economy and people, and on better recording the impacts of economic and other human activity on the environment. To this end, ecosystem accounting incorporates a wider range of benefits to people than captured in standard economic accounts and provides a structured approach to assessing the dependence and impacts of economic and human activity on the environment.

The SEEA EEA complements the measurement of the relationship between the environment and the economy described in the SEEA CF. The data on ecosystems can be combined with the data from the SEEA CF accounts on environmental pressures, individual resource stocks and environmental responses in the form of expenditures, taxes and subsidies, to provide a comprehensive picture of the environmental economic relationship.

2.3 SEEA-EEA Conceptual Structure

The SEEA EEA helps us understand how forests support communities by providing clean water. Forests act as natural filters, with trees and plants absorbing pollutants like nitrogen and phosphorus before they reach rivers and lakes. As a result, communities near healthy forests spend less on water treatment than those near degraded forests. In this way, ecosystems, depending on their health, provide valuable

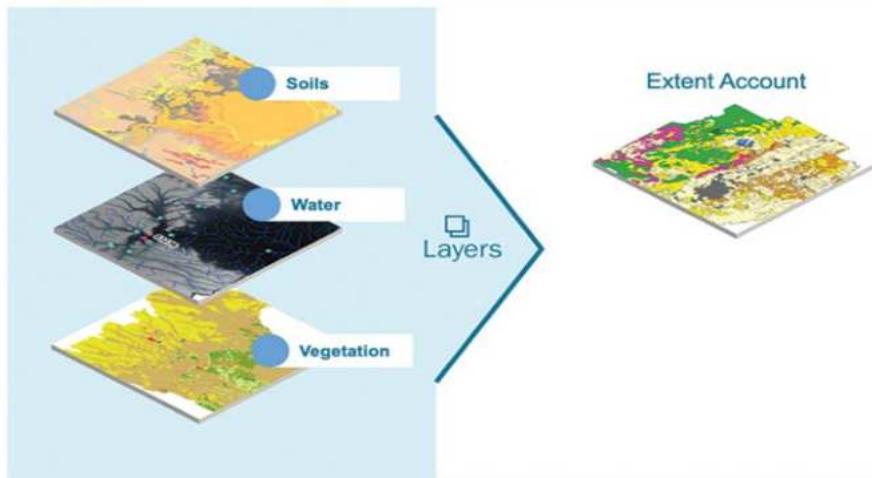
services that benefit specific populations. The SEEA EEA offers a clear picture of these contributions by breaking down the different components of this process.



(Source: https://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_EA_Final_2021.pdf, Page 12, Figure 2.1)

2.4 Key Features of the SEEA EEA

A key feature of the SEEA EA is its spatial approach, recognizing that the benefits of ecosystems depend on their location. This focus helps identify critical ecosystem assets, services, and their beneficiaries (households, businesses, and governments). Accounting tables are often complemented with maps, which combine geographical, environmental, ecological, and economic data. The below figure illustrates a hypothetical ecosystem extent account created by integrating multiple spatial datasets. This spatial information allows for more targeted policy efforts. Accounts can be built from underlying maps:



Source: (https://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_EA_Final_2021.pdf, Page 30, Figure 3.2)

A major advantage of the accounting framework is that it allows ecosystem contributions to be expressed in monetary terms. Since most ecosystem services are public goods without clear market prices, their value must be estimated using economic valuation methods. The SEEA EA leads the development of robust monetary estimation approaches aligned with the System of National Accounts.

Monetary estimates provide valuable information for decision-makers, such as in discussions with finance ministries, budget allocations, policy assessments, and raising awareness of ecosystems' economic contributions. However, monetary valuation is not essential in ecosystem accounting, and many efforts focus solely on physical measures.

The SEEA EA offers great flexibility, allowing accounts to be compiled at subnational or national levels, and across terrestrial, freshwater, and marine areas. Ecosystem assets and services can be presented in physical (e.g., hectares, tons) or monetary terms. Not all accounts need to be developed; their creation depends on national priorities and data availability.

2.5 SEEA-CF Accounts – Forest

In the SEEA, forests are considered a form of land cover and forestry is considered a category of land use. Often, forests are seen predominantly in terms of timber resources, i.e. the volume of standing timber, however, forests are used in the production of a wide range of products, hence forests and timber resources should not be equated. It is also the case that timber resources are not found solely in forests in many countries, other types of land cover, for example, other wooded land, contain timber resources. Given both the distinction between forests and timber resources, and the resource focus for environmental assets in the Central Framework, the classification of environmental assets includes forests as a subcategory of land, and distinguishes the timber resources located on this land as a separate environmental asset^{ix}.

Afforestation: Afforestation represents an increase in the stock of forest and other wooded land either due to the establishment of new forest on land that was previously not classified as forest land, or as a result of silvicultural measures such as planting and seeding. In particular, land previously classified as other wooded land may be converted to forest land as a result of silvicultural measures.

Natural expansion: Natural expansion is an increase in area resulting from natural seeding, sprouting, suckering or layering. Where the expansion is into the area of another type of forest or other wooded land (e.g., natural expansion of other naturally regenerated forest into other wooded land), a corresponding entry for natural regression should be recorded.

Deforestation: Deforestation represents a decrease in the stock of forest and other wooded land due to the complete loss of tree cover and transfer of forest land to other uses (e.g., use as agricultural land, land under buildings or roads) or to no identifiable use. Removals of standing timber do not lead to decreases in forest and other wooded land if the use of the land does not change after felling.

Natural regression: Natural regression should be recorded when the stock of forest and other wooded land reduces for natural reasons. An entry for natural regression should be recorded together with an entry for natural expansion when there are natural changes in the areas of different types of forest and other wooded land (e.g., natural expansion of other naturally regenerated forest into other wooded land, i.e., a natural regression of other wooded land).

The boundary between cultivated and natural timber resources: Determining whether timber resources are cultivated or natural is important in the application of the appropriate accounting treatment. The growth in cultivated timber resources is considered to be a process under the direct control, responsibility and management of institutional units. Consequently, the growth is recorded as occurring within the production boundary on an ongoing basis as an increase in inventories of those

enterprises undertaking the cultivation. (The removal of cultivated timber resources is recorded as a decrease in inventories of timber resources and an equivalent number of sales.) The growth of natural timber resources, on the other hand, is not considered to take place within the production boundary and is recorded as entering the production boundary only at the time the tree is removed from the forest or other land area.

The treatment of timber resources as either cultivated or natural depends on the management practices applied to the areas in which timber resources are found. For timber resources to be classed as cultivated, the management practices must constitute a process of economic production. This is likely to include activities such as (a) control of regeneration, for example, seeding, planting of saplings, thinning of young stands; and (b) regular and frequent supervision of trees to remove weeds or parasites, or to attend to disease. The level of these types of activity should be significant relative to the value of the timber resources and should be directly connected with the growth of the timber resources in question.

Additions to the stock: The stock of timber resources will increase due to natural growth. This is measured in terms of the gross annual increment, i.e., the volume of increment over the reference period of all trees with no minimum diameter. The calculation of natural growth should be based on the timber resources available at the beginning of the accounting period. Increases in the area of forest land, other wooded land and other areas of land that lead to increases in the volume of available timber resources should not be considered natural growth but should, instead, be recorded as reclassifications. Reclassifications may also occur as a result of changes in management practice that shift timber resources from cultivated to natural or vice versa.

Reductions in the stock: The stock of timber resources will decrease over an accounting period through the removal of timber resources and natural losses. Removals are estimated as the volume of timber resources removed from forest land, other wooded land and other land areas during the accounting period. They include removals of trees felled in earlier periods and the removal of trees killed or damaged by natural causes. Removals may be recorded by type of product (e.g., industrial roundwood or fuelwood) or by species of tree (e.g., coniferous or broadleaved). Removals constitute the relevant variable for measuring the extraction of timber resources because the definition of the stock of timber resources includes trees that have been felled and are on the ground but have not yet been removed. To fully account for the change in the volume of timber resources over an accounting period, it is necessary to deduct felling residues. These residues are associated with the fact that, at the time of felling, a certain volume of timber resources is rotten, damaged or in excess in terms of the size requirements. Felling residues exclude small branches and other parts of the tree that are also excluded from the scope of timber resources. Estimates of felling residues may also provide important information on the nature of forestry practice.

Natural losses: Natural losses are the losses to the growing stock (i.e., living, standing trees) during an accounting period due to mortality from causes other than felling. Examples include losses due to natural mortality, insect attack, fire, wind throw or other physical damages. Natural losses should include only those losses that can be reasonably expected when considering the timber resources as a whole. Natural losses should be recorded only when there is no possibility that the timber resource can be removed. All timber removed should be recorded as removals.

Catastrophic losses: Catastrophic losses should be recorded when there are exceptional and significant losses of timber resources due to natural causes. Catastrophic losses should be recorded only when there

is no possibility that the timber resource can be removed. All timber removed should be recorded as removals.

Felling's: While these entries fully account for the change in the volume of timber resources over an accounting period, there may be specific interest in the volume of trees felled during the period relative to the volume of timber resources removed. Annual felling's are equal to the volume of timber resources that is felled during an accounting period. Felling's include silvicultural and pre-commercial thinning's and cleanings. Where available, estimates of the volume of felling's may be added as supplementary information in the physical asset account.

Chapter III

Methodology for Forest Accounts

Chapter III

Methodology for Forest Accounts

3.1 The Two Paths of Natural Resource Accounting

The development of resource accounting is generally perceived as having gone along two different paths; these are characterized as "physical" accounts and "monetary" accounts. The "physical" approach is based on the laws of conservation of matter and of energy.

The "monetary" approach has its base in the pioneering work to set out the System of National Accounts (SNA) in order to better reflect on economic welfare.^x

Thematic Area of NRA/NCA in Bangladesh
Thematic Area 01: Environment, Climate Change and Disaster Risk Statistics
Bangladesh Disaster-related Statistics: Climate Change and Natural Disaster Perspectives
Compilation of Environmental Statistics (Collected from secondary sources)
Environmental Protection Expenditure and Resources Management Statistics/Accounts
Municipal (City corporations and Paurashavas) Waste Management Statistics/Accounts
Household Environmental Survey (HES) of Bangladesh 2023
Climate Vulnerability Index (CVI) on the basis of lowest administrative unit under the BESF 2016-2030 and Statistical Act 2013 using UNSD/Global Guideline
Thematic Area 02: Physical Flow and Monetary Valuation Land, Forest, Water etc.
Land Accounts
Forest Accounts
Ecosystem Accounts
Material Footprint and Domestic Material Consumption Accounts
Water Accounts
Air Emission Accounts/ GHG Inventories
Energy Accounts
Disaster Risk Reduction (DRR) Expenditure Accounts
Thematic Area 03: Physical Flow and Monetary Valuation of the Ocean and Fisheries
Ocean Accounts (Blue Economy)

Thematic Area of NRA/NCA in Bangladesh
Fisheries Accounts
Thematic Area 04: Poverty Environment Nexus (PEN)
Poverty Environment Accounts (PEA)
Measuring Green Growth Indicators of Bangladesh

3.2 Physical Asset Accounts for Forest and Other Wooded Land

For particular land uses or types of land cover, it is also possible to construct basic physical asset accounts as established for other resources. The most developed example is for forest and other wooded land. In principle, accounts for forest and other wooded land are a type of land account. The scope of the forest and other wooded land account is defined consistent with the definition of this land in the FAO Global Forest Resources Assessment 2010.

The following descriptions of different forest and other wooded land types are based on SEEA central framework-2012.

Forest and other wooded land types	Description
Forest land	Forest land is defined as land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. The scope of the forest and other wooded land account follows a land use perspective. Thus, it does not include land that is predominantly under agricultural or urban land use and is not strictly defined on the basis of changes in tree-covered areas.
Naturally regenerated forest	<p>Naturally regenerated forest is the forest that is predominantly composed of trees established through natural regeneration. In this context, “predominantly” means that the trees established through natural regeneration are expected to constitute more than 50 per cent of the growing stock at maturity.</p> <p>(a) Primary Forest: Primary Forest is naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed. Key characteristics of primary forests are that:</p> <ol style="list-style-type: none"> 1. They show natural forest dynamics, such as natural tree species composition, occurrence of dead wood, natural age structure and natural regeneration processes; 2. The area is large enough to maintain its natural characteristics; and 3. There has been no known significant human intervention or the last significant human intervention occurred long enough in the past to have allowed the natural species composition and processes to have become re-established.

Forest and other wooded land types	Description
	<p>(b) Other naturally regenerated forest: Other naturally regenerated forest is naturally regenerated forest with clearly visible indications of human activities. These include:</p> <ol style="list-style-type: none"> 1. Selectively logged-over areas, areas regenerating following agricultural land use and areas recovering from human-induced fires, etc.; 2. Forests where it is not possible to distinguish whether they are planted or naturally regenerated; 3. Forests with a mix of naturally regenerated trees and planted/seeded trees and where the naturally regenerated trees are expected to constitute more than 50 per cent of the growing stock at stand maturity; 4. Coppice from trees established through natural regeneration; and 5. Naturally regenerated trees of introduced species
Planted forests	Planted forests are predominantly composed of trees established through planting and/or deliberate seeding. Planted/seeded trees are expected to constitute more than 50 % of the growing stock at maturity, including coppice from trees that were originally planted or seeded.
Other wooded land	Other wooded land is land not classified as forest land, spanning more than 0.5 hectares; with trees higher than 5 metres and a canopy cover of 5-10 %, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 %. It does not include land that is predominantly under agricultural or urban land use.

3.3 Mapping of SEEA Forest and Other Wooded Land Classification; Bangladesh Perspective

UNSEEA-CF Forest and Other wooded land types Classification	Local classification
Primary Forest	
Other Naturally Regenerated Forest	Bamboo Forest Hill Forest Plain Land Forest (Sal Forest) Swamp Forest Mangrove Forest
Planted Forest	Forest Plantation Swamp Plantation Mangrove Plantation
Other wooded land	Shrub-covered areas

Chapter IV

Forest Account for Bangladesh

Chapter IV

Forest Account for Bangladesh

Forests play a critical role in sustaining environmental balance, supporting biodiversity, and contributing to economic and social well-being. In a country like Bangladesh, where natural resources are under increasing pressure, understanding the true value of forest ecosystems is essential for sustainable development. The Forest Account for Bangladesh is a significant step toward integrating forest-related data into national economic planning and environmental policy. By systematically compiling information on forest assets, services, and their contributions to the economy, this account provides a comprehensive foundation for informed decision-making, promoting conservation, and enhancing the resilience of communities that depend on forest resources. We can explore the findings in below:

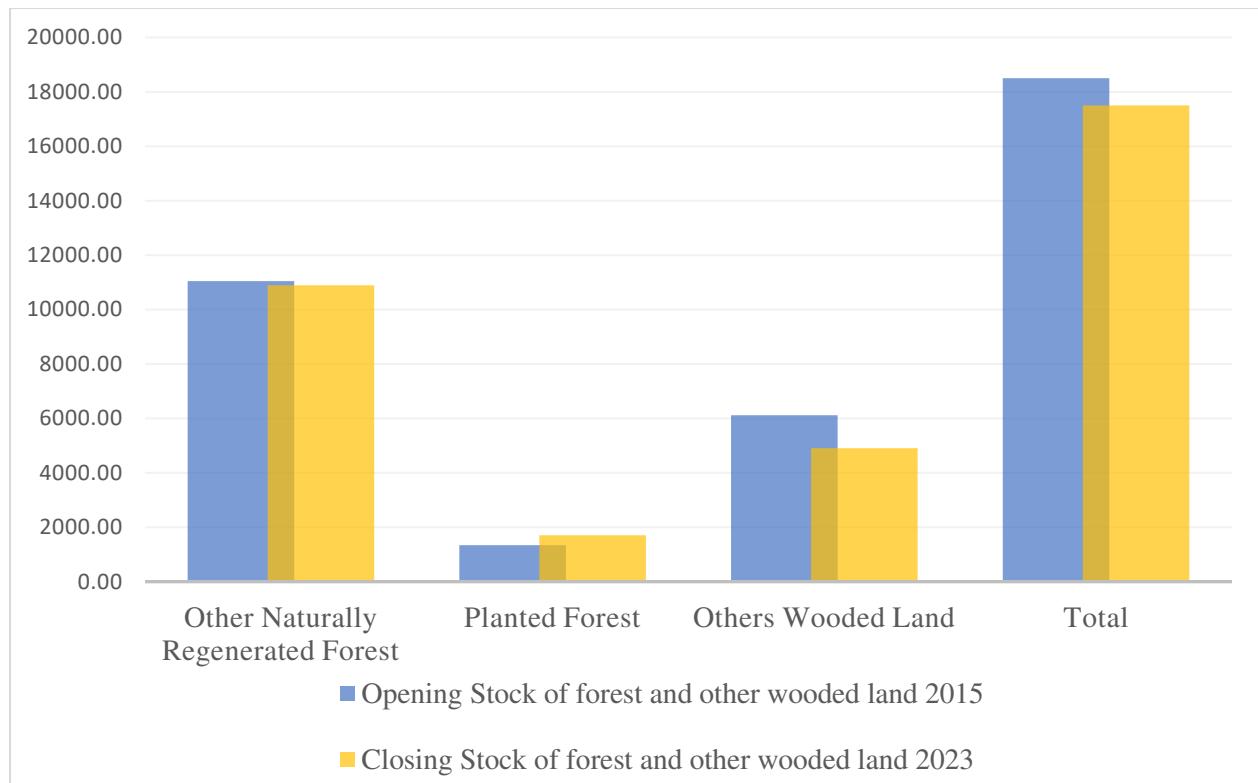
Table 4.1 Physical asset accounts for forest and other wooded land, Bangladesh, 2015 and 2023 (sq. km)

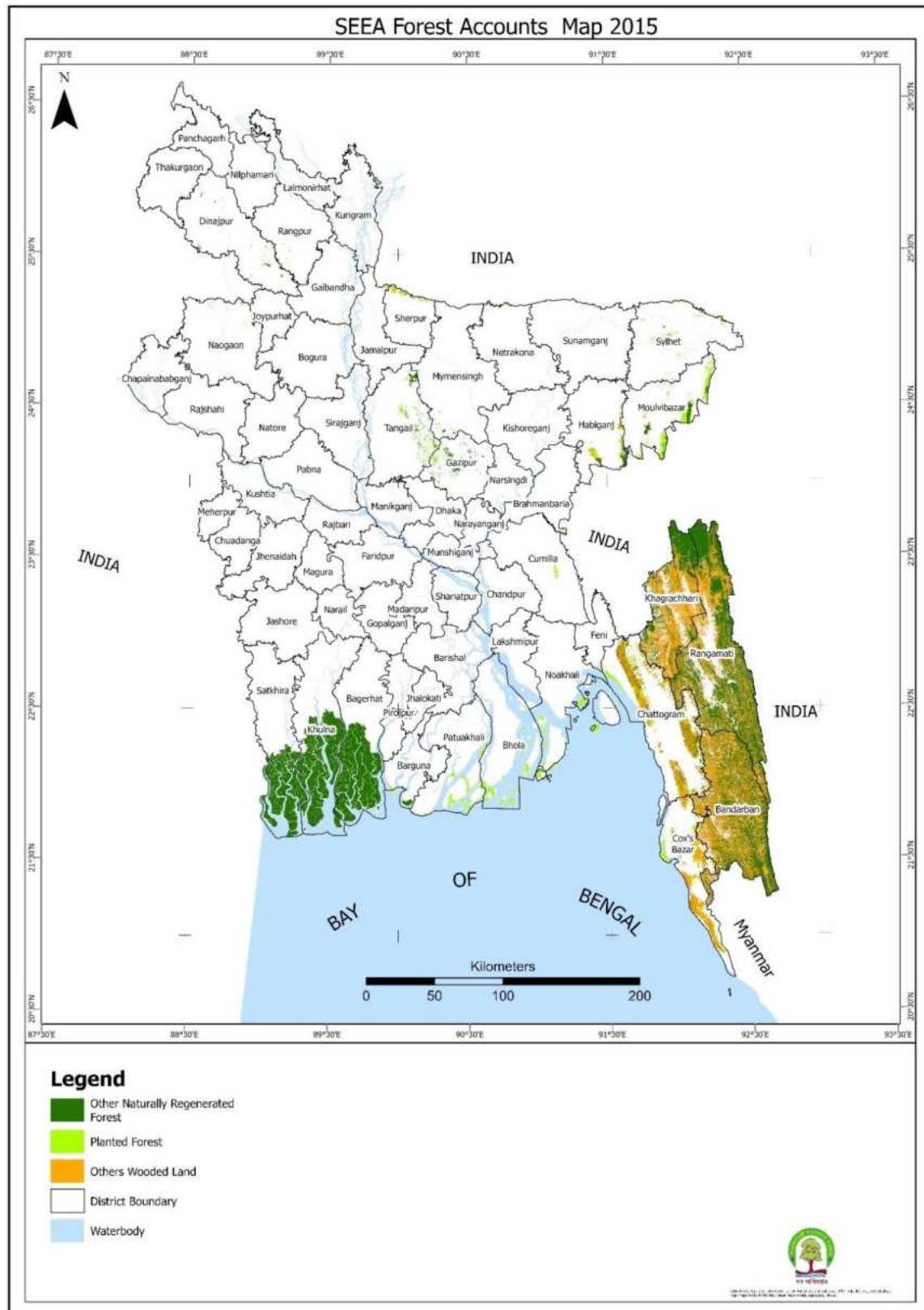
	Primary forest	Other naturally regenerated forest	Planted forest	Other wooded land	Total
Opening Stock of forest and other wooded land 2015	-	11043.83	1341.48	6113.77	18499.08
Additions to Stock	-	710.94	620.38	599.05	1930.37
Reductions in Stock	-	864.48	253.33	1813.47	2931.28
Closing Stock of forest and other wooded land 2023	-	10890.30	1708.53	4899.35	17498.18
Percentage (%) Change	-	-1.39	27.36	-19.86	-5.41

** Data Source: Forest Department

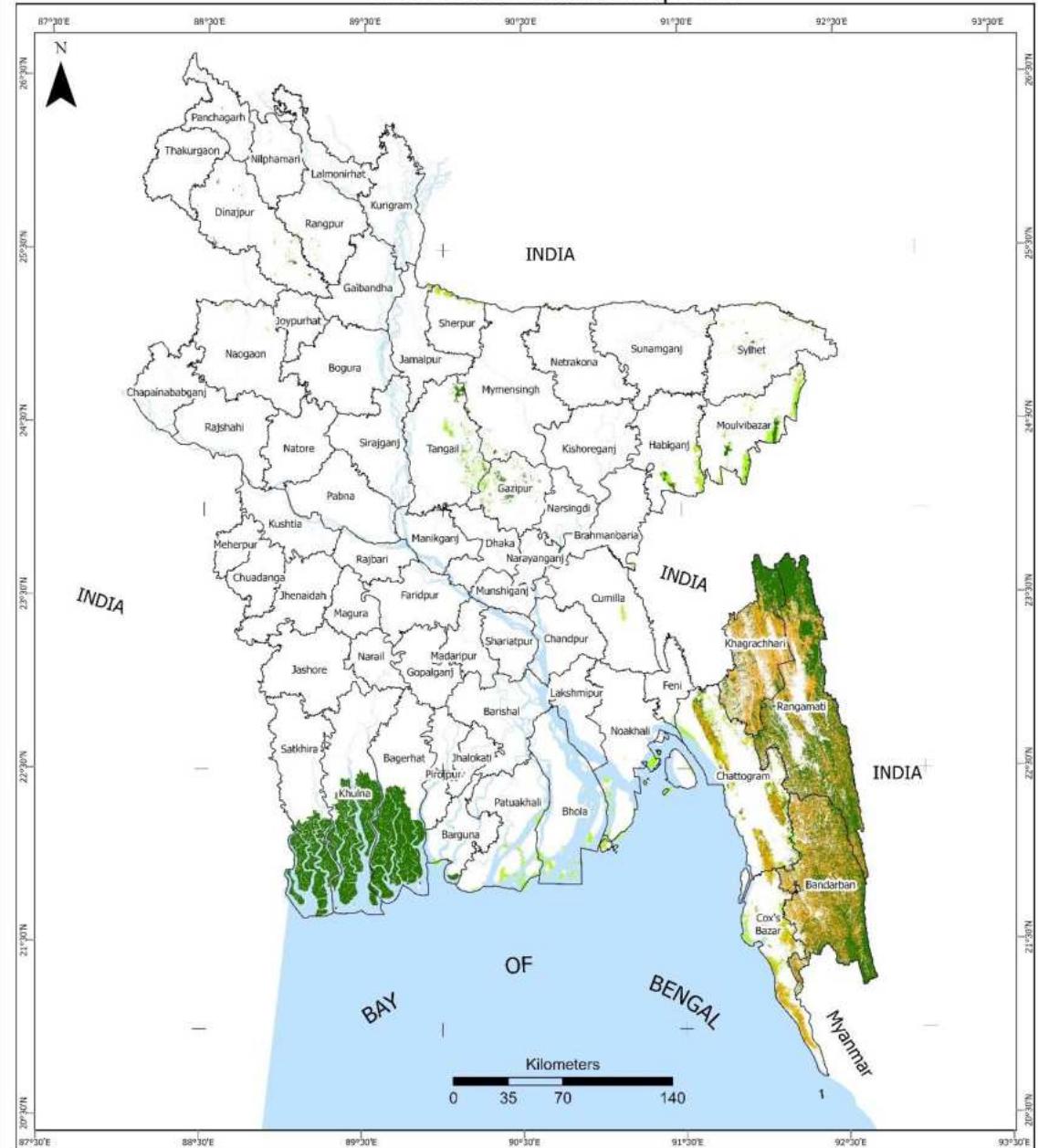
Table 4.1 portrays the physical asset accounts for forest and other wooded land of Bangladesh from 2015 to 2023 in Square Kilometre (sq. km) by forest and other wooded land cover classification reflecting the status of opening and closing stock from the specific years. Opening stock of Other naturally regenerated forest, Planted Forest and Other wooded land at 2015 are recorded 11043.83 and 1341.48 and 6113.77 sq. km respectively. On the other hand, after 08 years, at 2023 its closing stock is recorded 10890.30 (-1.39%), 1708.53 (27.36%) and 4899.35 (-19.86) sq. km respectively. Overall, opening stock of forest and other wooded land was 18499.08 sq. km at 2015 and after 08 years Closing stock of forest and other wooded land 2023 reached at 17498.18 sq. km i.e. 5.41% reduced from 2015 to 2023. According to SEEA, Forest Accounts Maps are given below as on 2015 and 2023:

Figure 4.1: Forest and other wooded land cover of Bangladesh from 2015 to 2023 in sq. km by classification.





SEEA Forest Accounts Map 2023



Legend

- Other Naturally Regenerated Forest
- Planted Forest
- Others Wooded Land
- District Boundary
- Waterbody



4.1 Physical asset accounts for timber resources (thousands of cubic metres over bark)

Timber resources are important environmental assets in many countries. They provide inputs for construction and the production of paper, furniture and other products and are both a source of fuel and an important sink for carbon. The compilation of timber resource asset accounts is one measurement tool that provides information for use in assessing and managing changes in timber resources and the services they provide. For a complete assessment of timber resources, it is also relevant to construct asset accounts regarding the stock of land associated with timber resources, primarily forest and other wooded land. The changes in the stock of forest and other wooded land due to afforestation and deforestation may be of particular interest.

The physical asset account for timber resources records the volume of timber resources at the beginning and end of an accounting period and the change in this stock over the accounting period. The particular interest is the analysis of the natural growth of timber resources compared with the removals. A basic structure for a physical asset account for timber resources is presented below. The asset account should distinguish between the types of timber resource, most importantly between cultivated timber resources and natural timber resources. For natural timber resources, a distinction should be made between those timber resources available for wood supply and those not available for wood supply, so as to ensure that the different scopes of the asset accounts in physical and monetary terms can be reconciled. Depending on the purpose of analysis and available data, accounts by species of tree may be compiled.

4.2 Monetary asset accounts for timber resources (currency units)

Monetary asset accounts for timber resources consist in measuring the value of the opening and closing stock of timber resources and the changes in the value of the stock over an accounting period.

Valuation the stock of timber resources: In line with its general definition, resource rent on timber resources can be derived as the gross operating surplus from the harvest of timber resources (after taking into account specific taxes and subsidies) less the value of the user costs of produced assets used in the harvesting process. Defined in this way, the resource rent will implicitly include a share that should be attributed to the land on which the timber stands. This reflects the composite nature of the overall asset. In many cases, owing to the location of the land or the quality of the soil, the return to the land may not be large compared with the return to the timber resource; but where relevant (e.g., where the land may be potentially of value for other purposes), an estimate of the resource rent attributable to land should be deducted for the purpose of deriving the estimate of resource rent on timber resources.

Resource rent can be estimated more directly by using estimates of the stumpage price, which is the amount paid per cubic metre of timber by the harvester to the owner of the timber resources. The stumpage price itself may also be derived by deducting various harvesting costs from roadside pickup prices (also called wood-in-the-rough or raw wood prices). The harvesting costs should include felling costs as well as costs of thinning (net of any receipts), other management costs and rent on land. For natural timber resources, these additional costs may be very low or even zero. Where timber resources are sold prior to felling, relevant contract prices may also be used, with appropriate adjustments for the scope and coverage of the prices to align them with the concept of resource rent.

Valuation of removals, natural growth, depletion and other flows: In general terms, the valuation of flows of timber resources (including removals, natural growth, depletion and other flows) should be undertaken using the same in situ resource prices underlying the valuation of the opening and closing

stock of timber resources. With respect to catastrophic losses, for example, due to wind throw or forest fire, when a catastrophic event does not fully destroy the wood, it is necessary to consider the value of the wood that will be salvaged. Prices may rise following destruction of timber resources due to fire or they may fall if trees are killed but not destroyed in storms. The price changes will reflect the changes in the pattern of timber available to be supplied. Further, the stumpage value of the salvaged timber has to be accounted for in the value of the stock for the period until its removal from the forest, which, in some cases, may take a number of years.

Other changes that affect the value of stocks of standing timber as a resource for the logging industry are changes in use or status, for example, when forests are protected and logging is prohibited. In this case, the value of the standing timber, in terms of income from the sale of timber resources, is reduced to zero.

Chapter V

Ecosystem Accounts-Bangladesh Perspective

Chapter V

Ecosystem Accounts-Bangladesh Perspective

Bangladesh Bureau of Statistics (BBS) as a National Statistical Organization, generating the Socio-Economic and Demographic statistics as well as environmental Statistics by conducting different surveys as well as compiling from the different secondary sources. According to SEEA, BBS is compiling the Land, Forest and Ecosystem Accounts for the first ever in Bangladesh. This is baseline and it is providing a unique picture of land and Forest in details and little glimpse of Ecosystem Accounts. Basically, Bangladesh is a densely populated country in South Asia, bordered by India on three sides, Myanmar to the southeast, and the Bay of Bengal to the south. It has a population exceeding 160 million people, making it one of the most populous countries in the world. Dhaka is the capital and largest city of the country. The economy of Bangladesh has seen impressive growth in recent decades, primarily driven by textiles, agriculture, and remittances. However, the country faces significant challenges such as poverty, overpopulation, climate change, and environmental degradation.

Ecosystem accounts are a method for systematically assessing the contribution of natural ecosystems to human well-being, including their role in providing essential ecosystem services (e.g., water purification, climate regulation, pollination). These accounts are essential for sustainable development, as they provide data that can help policymakers make informed decisions about the management and conservation of natural resources.

In Bangladesh, ecosystem accounting is particularly important due to the country's vulnerability to climate change, over-exploitation of natural resources, and its heavy reliance on agriculture and fisheries. The System of Environmental-Economic Accounting (SEEA) is a framework used globally to integrate economic and environmental data, and Bangladesh has started incorporating it into its national statistics.

5.1 Key Aspects of Ecosystem Accounts

- i) Biodiversity and Ecosystem Services: Bangladesh is home to rich biodiversity, including the Sundarbans, the world's largest mangrove forest, which provides significant ecosystem services like coastal protection, carbon sequestration, and supporting fisheries.
- ii) Natural Resource Management: Ecosystem accounting helps track the condition and extent of vital resources like forests, wetlands, and agricultural land. This is crucial for sustainable land use planning and reducing the risk of land degradation.
- iii) Climate Change Resilience: Bangladesh is highly vulnerable to the impacts of climate change, including flooding, cyclones, and rising sea levels. Ecosystem accounts can help assess how ecosystems can mitigate these impacts, for example, through coastal mangrove forests or floodplain wetlands.
- iv) Valuation of Ecosystem Services: Bangladesh has initiated projects to estimate the economic value of ecosystem services. This is crucial for demonstrating the value of ecosystems in economic terms, influencing policy decisions, and encouraging conservation efforts.
- v) Policy Integration: Ecosystem accounting helps in integrating environmental concerns into national policies and development plans. It encourages a holistic view of the economy that accounts for the value of nature, not just market-based transactions.

Ecosystem accounts in Bangladesh are a valuable tool to promote sustainable development, ensuring that economic growth does not come at the expense of the country's natural wealth and the long-term well-being of its people.

The **Ecosystem Accounts for Bangladesh** provide a comprehensive framework to measure and value the country's natural capital, including forests, wetlands, agricultural lands, and coastal ecosystems. By integrating environmental data with economic and social statistics, these accounts help capture the true contribution of ecosystems to human well-being and national development. This approach supports evidence-based policymaking, ensuring that the management of natural resources aligns with goals for sustainability, climate resilience, and inclusive growth. As Bangladesh faces growing environmental challenges, ecosystem accounting offers a vital tool to balance development with ecological integrity. The Ecosystem Accounts can be compiled using the following tools, concepts, and methods:

First of all, we can express bit about SEEA, the SEEA (System of Environmental Economic Accounting) EA (Ecosystem Accounts) is comprehensive in its coverage of ecosystems, including all terrestrial, freshwater, marine and subterranean ecosystem realms. Further, in describing the connection between ecosystems and economic and human activity, it has a deliberate focus on ecosystem services reflecting the many direct and indirect uses of ecosystems. However, this coverage does not encompass all of the potential connections with ecosystems. Specifically, the measurement scope of the SEEA EA does not directly encompass the importance of ecosystems arising from their ongoing existence and only captures a portion of significant cultural and spiritual relationships we have with the environment.

5.2 Core accounts of the Ecosystem Accounting Framework^{xi}

- i) Ecosystem extent accounts
- ii) Ecosystem condition accounts
- iii) Ecosystem services accounts
- iv) Ecosystem monetary asset accounts

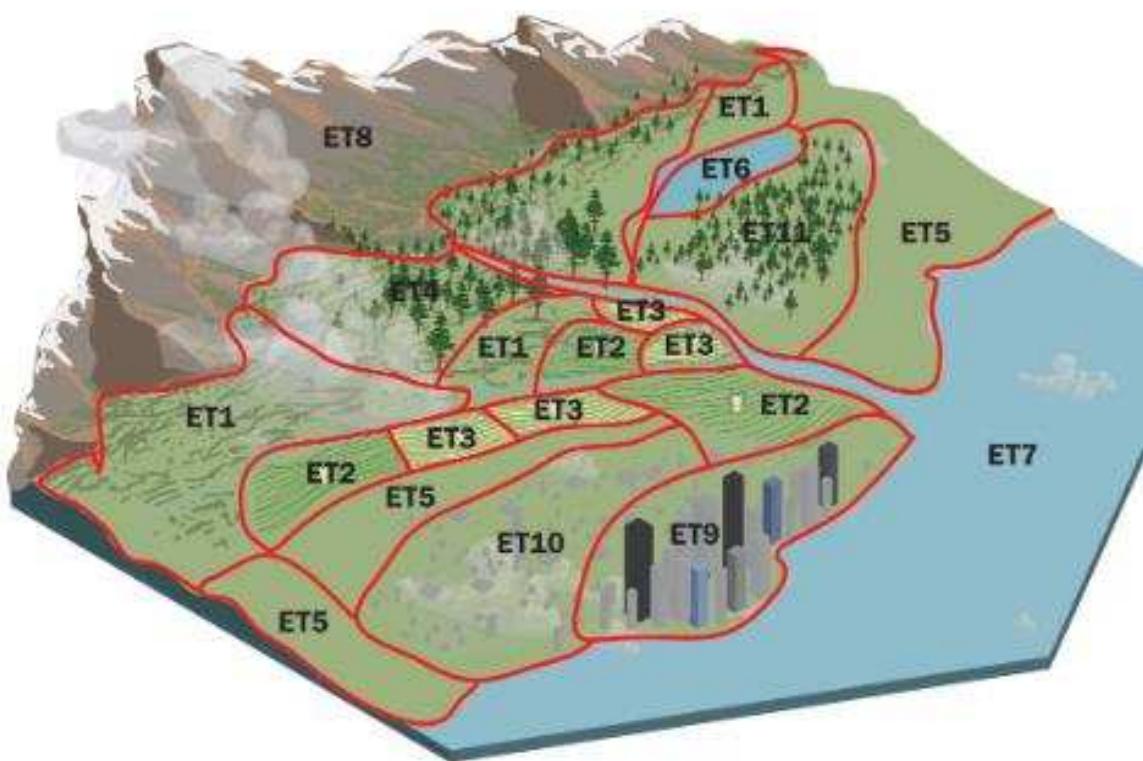
There are also accounts for specific subject areas. This section provides an overview of two such accounts: species and carbon. Other accounts are also being pursued topics such as oceans and protected areas.

i) Ecosystem Extent Accounts

Ecosystem Extent Accounts provide vital data on the size, distribution, and changes in various ecosystem types across a country. In the context of Bangladesh, a nation with diverse and dynamic landscapes including forests, wetlands, rivers, coastal zones, and agricultural lands—these accounts are essential for monitoring environmental change and land use dynamics. Rapid urbanization, population pressure, and climate impacts are driving significant shifts in ecosystem coverage. By developing Ecosystem Extent Accounts, Bangladesh can better track the degradation or expansion of critical ecosystems, inform land management policies, and support sustainable development planning. These accounts are a foundational step toward integrating environmental sustainability into national statistics and policy frameworks^{xii}.

Basically, this account serves as a common starting point for ecosystem accounting. It organizes information on the extent of different ecosystem types (e.g. forests, wetlands, agricultural areas, marine areas) within a spatial area (administrative region, river basin, etc.) in terms of area.

Ecosystem accounts describe the environment in terms of sets of mutually exclusive (i.e. non-overlapping) ecosystem assets (EA). These assets can be classified by different ecosystem types (ET) such as forests, wetlands, cropland etc. All assets together populate the Ecosystem Accounting Area (EAA), and examples include a municipality, a state, a river basin, a country etc. The below figure shows an ecosystem accounting area, which could be an administrative region with different ecosystem types.



Source: https://seea.un.org/sites/seea.un.org/files/documents/EA/3._ecosystem_extent_and_ecosystem_typerology_v1.0_0.pdf

Extent accounts can play a role in implementing global commitments and tracking their progress. For example, by overlaying the extent account with information on protected areas, it is possible to track Aichi targets such as goals for percentages of land set aside for ecological protection. The extent account is an important building block for the development of specific thematic accounts, such as protected area accounts.

In this publication we emphasized the Ecosystem Extent Accounts and in Bangladesh, Ecosystem extent Accounts can be crucial for understanding the extent and changes in key ecosystems such as:

a) Coastal and Mangrove Ecosystems:

Bangladesh's coastal and mangrove ecosystems, including the world-renowned Sundarbans, play a crucial role in protecting the coastline, supporting biodiversity, and sustaining millions of livelihoods. These ecosystems act as natural barriers against cyclones, storm surges, and erosion, while also serving as vital habitats for species like the Royal Bengal Tiger and numerous fish and bird species.

However, these ecosystems are under growing threat from climate change, sea level rise, salinity intrusion, and human activities such as overexploitation and unplanned development. The degradation of coastal ecosystems not only undermines biodiversity but also increases the vulnerability of coastal communities.

To address these challenges, Bangladesh is advancing conservation efforts through community-based management, coastal afforestation, and the integration of ecosystem values into national planning. Ecosystem accounting is emerging as a valuable tool to inform sustainable management and policy decisions, ensuring long-term resilience and ecological integrity.

b) Wetlands and Haors:

Wetlands, particularly **haors** (seasonal floodplain depressions), are among Bangladesh's most valuable ecosystems. Predominantly located in the country's northeastern region, haors support rich biodiversity, sustain agriculture and fisheries, and provide vital ecosystem services such as water storage, groundwater recharge, and flood regulation.

From an **ecosystem accounting** perspective, wetlands and haors are essential for understanding the natural capital that underpins rural livelihoods and food security. However, these ecosystems are increasingly threatened by land-use change, overfishing, pollution, siltation, and climate-related impacts such as erratic rainfall and prolonged flooding.

Developing **ecosystem accounts** for wetlands and haors allows Bangladesh to systematically measure changes in their extent, condition, and service flows. This data is critical for valuing their contributions to the economy and integrating wetland management into development planning. By recognizing wetlands as economic assets, ecosystem accounts support informed decision-making for conservation, disaster resilience, and sustainable resource use.

c) Forests:

Forests in Bangladesh ranging from the mangroves of the Sundarbans to the hill forests of Chattogram and the sal forests of central regions, are vital ecosystems that provide a wide array of goods and services. They support biodiversity, store carbon, regulate climate, prevent soil erosion, and sustain the livelihoods of forest-dependent communities.

In the context of **ecosystem accounting**, forests are recognized not just for their timber value but for their broader contribution to the economy and environment. Through the **Forest Ecosystem Accounts**, Bangladesh can assess the extent, condition, and economic value of forest ecosystems, including provisioning (e.g., fuelwood, timber), regulating (e.g., carbon sequestration, flood control), and cultural services. Woodlands and forests were distinguished by structure and use. Planted and managed primarily for commercial production^{xiii}.

These accounts help policymakers understand the trade-offs between conservation and development and promote the sustainable management of forest resources. As deforestation, degradation, and land-use pressures continue, ecosystem accounting offers a powerful tool to guide forest policy, monitor trends, and align national planning with environmental sustainability. Here we can see the spatial and temporal plant trait data reveal forest ecosystem changes^{xiv}.

d) River Systems and Floodplains:

Bangladesh is a riverine country shaped by the vast Ganges-Brahmaputra-Meghna River system and its extensive floodplains. These ecosystems are central to agriculture, fisheries, water supply, and disaster mitigation, providing essential services that support millions of livelihoods and national food security.

From an **ecosystem accounting** perspective, river systems and floodplains are critical natural assets. They offer provisioning services like freshwater and fish, regulating services such as flood control and sediment transport, and support biodiversity and nutrient cycling. However, these ecosystems are under pressure from pollution, encroachment, upstream water diversion, and climate-induced changes.

By developing **Ecosystem Accounts** for rivers and floodplains, Bangladesh can better quantify their ecological and economic value, monitor changes in extent and condition, and inform integrated water resource management. These accounts help ensure that the role of rivers and floodplains is fully reflected in policy, planning, and investment decisions, promoting sustainability and resilience in a climate-vulnerable landscape. Also note that Inland freshwater ecosystems within drylands—such as rivers, lakes, reservoirs, and wetlands are critically important due to their high potential for providing ecosystem services^{xv}.

ii) Ecosystem Condition Accounts

This account evaluates the overall quality of an ecosystem asset by using a set of key indicators to assess the ecosystem's condition and function. It looks at both its natural state and its ability to provide ecosystem services.

Ecosystem Condition Accounts assess the health and quality of ecosystems based on physical, chemical, and biological indicators. In Bangladesh, these accounts are crucial for monitoring changes in key ecosystems such as forests, wetlands, rivers, and coastal areas, which are increasingly threatened by pollution, land use change, and climate impacts.

By tracking indicators like vegetation health, water quality, soil fertility, and biodiversity, these accounts help measure ecosystem degradation and guide restoration and conservation efforts. For example, they can monitor forest canopy loss, wetland water levels, or river pollution levels.

Ecosystem Condition Accounts support better policymaking by identifying priority areas for intervention, evaluating the effectiveness of environmental programs, and promoting sustainable development. In a climate-vulnerable country like Bangladesh, they are essential tools for integrating environmental health into national planning and resilience strategies.

iii) Ecosystem Services Accounts

Ecosystem Services Accounting (ESA) is a method of valuing the benefits people receive from nature, such as food, water, flood control, and climate regulation. In Bangladesh, where ecosystems like the Sundarbans, wetlands, rivers, and forests play a crucial role in supporting livelihoods and protecting against climate change, ESA is particularly important. It helps integrate the value of natural resources into national planning and decision-making, promoting sustainable development.

Bangladesh has begun implementing ESA through initiatives by the Bangladesh Bureau of Statistics and the Ministry of Environment, with support from international organizations like the UN and World Bank. Studies have shown the economic importance of areas like the Sundarbans and haor wetlands, emphasizing their role in disaster risk reduction and food security.

However, challenges remain, including limited data, lack of technical expertise, and weak coordination among agencies. To strengthen ESA, Bangladesh must improve data systems, build institutional capacity, and raise awareness of the value of ecosystem services. Doing so will help the country protect its natural assets while ensuring sustainable growth and climate resilience.

SEEA EA uses the following three broadly agreed on categories of ecosystem services:

(a) Provisioning services refer to the tangible products obtained from ecosystems, such as food, water, timber, fuel, and medicinal resources. In Bangladesh, these services are vital for both rural livelihoods and national economic activities. The country's rivers, wetlands, forests, and agricultural lands provide essential resources like fish, rice, fruits, vegetables, freshwater, and wood.

Ecosystem Services Accounting in Bangladesh has highlighted the economic value of these provisioning services, especially from ecosystems like the Sundarbans (for fisheries and timber), haor wetlands (for rice and fish), and hill tracts (for fruits and medicinal plants). Including these values in national accounts helps recognize their contribution to GDP and ensures better management and conservation of natural resources. It also supports sustainable development planning by showing the true cost of resource degradation and overexploitation.

(b) Regulating services are the benefits ecosystems provide by maintaining environmental balance, such as climate regulation, flood control, water purification, and carbon sequestration. In Bangladesh, these services are crucial due to the country's high vulnerability to climate change, flooding, and natural disasters.

Ecosystem Services Accounting in Bangladesh recognizes the importance of regulating services provided by key ecosystems. The Sundarbans, for example, act as a natural barrier against cyclones and storm surges, while wetlands and floodplains regulate water flow and reduce flood risks. Forests and coastal vegetation also help in carbon storage and erosion control. Accounting for these services supports better policy-making, disaster risk management, and long-term planning for climate resilience and sustainable land use. The origin of ecosystem services can be linked to dominant land use types within land cover categories based on causal relationships^{xvi}.

(c) Cultural services refer to the non-material benefits people obtain from ecosystems, including recreation, spiritual value, cultural heritage, and educational experiences. In Bangladesh, ecosystems like the Sundarbans, hill tracts, rivers, and rural landscapes hold deep cultural, spiritual, and recreational significance.

Ecosystem Services Accounting in Bangladesh acknowledges these values by highlighting how nature supports tourism, local traditions, and community identity. For instance, the Sundarbans is a UNESCO World Heritage Site and attracts both domestic and international visitors, while rivers and forests are central to many religious and cultural festivals. Recognizing these services in national planning promotes eco-tourism, protects cultural heritage, and supports sustainable development with respect for local and indigenous values.

iv) Monetary Asset Accounts

This account tracks the monetary value of ecosystem assets, including opening and closing stocks, as well as additions and reductions. The ecosystem services supply accounts estimate the total annual flow of services generated in the year. Ecosystem asset values can be calculated using the Net Present Value method, which capitalizes on the value of annual service flows over the ecosystem's expected lifetime.

Here the calculation also considers the ecosystem's ability to sustain service flows, depending on its condition, extent, and management. Valuing natural capital flows helps estimate asset values and provides a more comprehensive view of a country's wealth, including natural, produced, financial, human, and social capital. Indicators like wealth per capita and its change over time show whether the country is on a sustainable growth path.

Monetary Asset Accounts measure the economic value of natural resources and ecosystem services, expressing them in financial terms to reflect their contribution to national wealth. In Bangladesh, integrating these accounts helps quantify the value of forests, fisheries, land, and water resources within the national accounting framework.

Through initiatives like the System of Environmental-Economic Accounting (SEEA), Bangladesh has begun valuing assets such as timber from forests, fish stocks from rivers and wetlands, and agricultural land. This allows policymakers to assess the sustainability of resource use, understand depreciation due to overexploitation, and plan investments in conservation. Including natural capital in financial terms supports better budgeting, long-term economic planning, and sustainable development goals.

Chapter VI

Thematic Species and Thematic Carbon

Chapter VI

Thematic Species and Thematic Carbon

The relationship between biodiversity specifically species and ecosystem services are foundational to environmental sustainability and human well-being. In the context of Bangladesh, a biologically diverse country with a variety of unique ecosystems, accounting for species within Ecosystem Services Accounts (ESA) is critical to understanding and maintaining the flow of benefits that ecosystems provide. Limited environmental education reduces local community involvement in conservation, making management responsible for raising awareness. Meanwhile, climate change adds significant challenges to biodiversity and environmental management^{xvii}.

6.1 Importance of Species in Ecosystem Services^{xviii}

Species contribute directly and indirectly to various types of ecosystem services:

- **Provisioning services:** Fish species, medicinal plants, and livestock varieties are vital for food security and health.
- **Regulating services:** Biodiverse forests and wetlands rely on native species to regulate water, sequester carbon, and support pollination.
- **Cultural services:** Many species hold cultural, religious, and recreational significance (e.g., the Bengal tiger and hilsa fish).
- **Supporting services:** Species diversity supports ecosystem productivity, resilience, and nutrient cycling.

In Bangladesh, this biodiversity is deeply tied to the livelihoods of millions, especially in rural and coastal communities.

6.2 Biodiversity Hotspots and Key Ecosystems in Bangladesh

Bangladesh hosts a range of critical ecosystems rich in species diversity:

- **Sundarbans Mangrove Forest:** Home to the endangered Royal Bengal tiger, crocodiles, and numerous fish, bird, and plant species. These species contribute to fisheries, ecotourism, and coastal protection.
- **Hill Tracts:** Contain rare orchids, medicinal plants, and culturally significant species used by indigenous communities.
- **Wetlands and Floodplains:** Crucial for migratory birds, fish biodiversity, and rice-fish farming systems.
- **Haor and Baor Wetlands:** Support large fish populations and seasonal biodiversity that is essential for food and income.

6.3 Ecosystem Services Accounting Linked to Species

Ecosystem Services Accounting in Bangladesh has started to incorporate species-related data in various ways:

- **Valuation of provisioning services:** For example, the hilsa fish, a culturally iconic and economically important species, contributes significantly to fisheries and is valued in monetary terms.

- **Carbon and biodiversity valuation in forests:** Programs like REDD+ (Reducing Emissions from Deforestation and Forest Degradation) assess forest species diversity alongside carbon storage benefits.
- **Tourism revenue:** Species like the Bengal tiger and migratory birds attract eco-tourism, which has been measured in economic terms in the Sundarbans and other protected areas.

6.4 Challenges in Accounting for Species for Bangladesh

While the link between species and ecosystem services is recognized, there are challenges in fully integrating species into national ESA frameworks:

- **Data gaps:** Comprehensive species inventories and long-term biodiversity monitoring are limited, particularly for non-charismatic and lesser-known species.
- **Valuation complexity:** It is difficult to assign accurate monetary values to many regulating or cultural services provided by species.
- **Institutional capacity:** Lack of trained personnel and coordination among departments limits the integration of biodiversity data into ecosystem accounts.
- **Habitat degradation:** Ongoing loss of habitats due to land use change, pollution, and climate change threatens species that underpin ecosystem services.

6.5 Institutional Efforts

Bangladesh has made notable progress in recognizing the value of species in ecosystem functioning^{xix}:

- **National Biodiversity Strategy and Action Plan (NBSAP):** Emphasizes the importance of biodiversity for ecosystem services and aims to improve data and conservation efforts.
- **Protected Areas and Community-Based Conservation:** Help preserve species that contribute to local livelihoods and ecosystem health.
- **Bangladesh Bureau of Statistics (BBS):** Works on Natural Capital Accounting initiatives under frameworks like SEEA, with some focus on biodiversity indicators.
- **Academic and NGO research:** Institutions like IUCN Bangladesh and universities have conducted biodiversity valuation studies that support ESA.

To strengthen the role of species in Ecosystem Services Accounts in Bangladesh, the following actions are recommended:

- **Improve species inventory and monitoring systems**, especially for threatened and economically important species.
- **Integrate biodiversity data into national accounting systems** through SEEA and related frameworks.
- **Invest in capacity-building** across government institutions to support biodiversity-based ecosystem accounting.
- **Promote community engagement** to incorporate traditional knowledge and ensure species conservation aligns with local development.
- **Support interdisciplinary research** that links ecology, economics, and policy to assess the full value of species in ecosystem services.

6.6 Thematic: Carbon

Carbon plays a central role in regulating the global climate, and ecosystems act as both sources and sinks of carbon through processes like carbon sequestration and emissions. In Ecosystem Services

Accounts (ESA), carbon is treated as a key regulating service due to its role in climate stability, air quality, and overall ecosystem health. For a climate-vulnerable country like Bangladesh, incorporating carbon into ecosystem accounting is especially important for informed decision-making, sustainable land use, and meeting international climate commitments^{xx}.

1. Importance of Carbon Regulation in Bangladesh

Bangladesh is one of the most climate-sensitive countries in the world, frequently affected by floods, cyclones, sea-level rise, and temperature variability. Although its per capita carbon emissions are low, the country's ecosystems such as forests, wetlands, coastal zones, and agricultural lands play an essential role in regulating carbon by:

- Sequestering atmospheric CO₂
- Storing carbon in biomass and soil
- Reducing greenhouse gas emissions through land and water management practices

Recognizing and accounting for these carbon-related services is essential to enhance climate resilience and support sustainable development^{xxi}.

2. Key Ecosystems as Carbon Sinks in Bangladesh

a) Sundarbans Mangrove Forest

- The Sundarbans is a critical carbon sink, storing large amounts of carbon in its dense mangrove biomass and soils.
- It not only helps mitigate climate change but also provides co-benefits like storm protection and biodiversity conservation.

b) Hill Forests and Reserved Forests

- Natural forests in the Chittagong Hill Tracts and other regions sequester significant amounts of carbon annually.
- These areas are under pressure from deforestation, shifting cultivation, and illegal logging, which risks turning them into carbon sources.

c) Wetlands (Haors, Baors, and Peatlands)

- Wetlands store carbon in sediments and vegetation and help regulate methane emissions.
- However, drainage and land conversion for agriculture can lead to carbon release.

d) Agricultural Lands

- Depending on land management, agricultural systems can act as modest carbon sinks or emitters.
- Practices like agroforestry, conservation tillage, and organic farming enhance soil carbon storage.

3. Ecosystem Services Accounting for Carbon

Bangladesh has taken initial steps to account for carbon in its ecosystem services through both national and international initiatives:

- REDD+ Program: Under the UNFCCC mechanism, Bangladesh is implementing REDD+ (Reducing Emissions from Deforestation and Forest Degradation), which involves assessing forest carbon stocks and providing financial incentives for conservation.
- Nationally Determined Contributions (NDCs): Bangladesh has committed to reducing greenhouse gas emissions in specific sectors, and ecosystem carbon accounting supports tracking and achieving these targets.
- System of Environmental-Economic Accounting (SEEA): The Bangladesh Bureau of Statistics (BBS) is working with international partners to incorporate carbon stocks and flows into natural capital accounts, as part of broader environmental-economic integration.

4. Challenges in Carbon Accounting

Despite progress, several challenges hinder effective carbon-related ecosystem accounting in Bangladesh:

- Lack of consistent and high-quality carbon stock data, especially for soil and below-ground biomass.
- Limited technical expertise in remote sensing, carbon modeling, and economic valuation of carbon services.
- Inadequate institutional coordination among agencies responsible for forestry, land, environment, and climate change.
- Weak enforcement of forest protection laws, leading to continued carbon loss through deforestation and degradation.

5. Policy and Planning Integration

Incorporating carbon into ecosystem services accounts can directly support national planning and international obligations:

- Bangladesh Climate Change Strategy and Action Plan (BCCSAP): Highlights the role of ecosystems in climate mitigation and adaptation.
- Bangladesh Forest Policy 2016: Encourages carbon trading and valuation of ecosystem services.

To enhance carbon-related ecosystem services accounting in Bangladesh, the following steps are recommended:

- Develop a national carbon inventory for all major ecosystems, including forests, wetlands, and agricultural lands.
- Invest in capacity-building and technology, including GIS, remote sensing, and carbon modeling tools.
- Strengthen cross-sectoral collaboration among environmental, forestry, and planning agencies.
- Mainstream carbon valuation in national budgeting, land-use decisions, and environmental impact assessments.
- Promote community-based carbon monitoring and benefit-sharing through programs like REDD+.

Chapter VII

Policy linking to the National Development Plan

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Policy linking to the National Development Plan

Policy Linking to the National Development Plan

Integrating Ecosystem Accounting (EA) into national development planning is vital for ensuring sustainable growth, environmental conservation, and climate resilience. In the case of Bangladesh, where natural ecosystems like forests, wetlands, rivers, and coastal zones are critical for livelihoods and disaster protection, linking ecosystem accounting with the country's development policies is both strategic and necessary^{xxii}.

1. Overview of National Development Planning in Bangladesh: Bangladesh's development priorities are guided by several key national plans and strategies, including:

- Perspective Plan 2041
- Eighth Five Year Plan (2020–2025)
- Bangladesh Climate Change Strategy and Action Plan (BCCSAP)
- National Sustainable Development Strategy (NSDS)
- National Biodiversity Strategy and Action Plan (NBSAP)
- National Adaptation Plan (NAP) and Nationally Determined Contributions (NDCs)
- Each of these frameworks' highlights sustainability, climate adaptation, and resource efficiency as central pillars of development—areas where ecosystem accounting can play a crucial supporting role.

2. Ecosystem Accounting and Its Relevance to Policy: Ecosystem Accounting (EA), based on the UN System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA-EA), provides a structured method to measure the contribution of natural ecosystems to the economy and human well-being in physical and monetary terms. For Bangladesh, EA enables:

- Tracking degradation and enhancement of ecosystems over time
- Valuing natural capital alongside produced and human capital
- Supporting evidence-based budgeting, planning, and policy-making
- Balancing development needs with ecological sustainability

3. Linkages with Specific National Policies and Plans

- a) Perspective Plan 2041
 - Aims to achieve high-income status with environmental sustainability.
 - Supports long-term investment decisions based on ecosystem service valuation.
- b) Eighth Five Year Plan (2020–2025)
 - Emphasizes green growth, climate adaptation, and resilience.
 - Recognizes the need for Natural Capital Accounting (NCA) to integrate environmental resources into national accounts.
 - EA supports sectoral planning in agriculture, water, forestry, and urban development.
 - A long-term integrated plan focusing on water security, climate resilience, and sustainable land use.
 - EA is crucial for identifying the ecological value of wetlands, floodplains, and mangroves.
 - Supports scenario analysis and cost-benefit evaluations of adaptation measures.

- c) National Biodiversity Strategy and Action Plan (NBSAP)
- Seeks to conserve biodiversity and ensure its sustainable use.
- EA helps quantify the contribution of biodiversity to ecosystem services and integrates biodiversity values into national planning and accounting.
- d) Bangladesh Climate Change Strategy and Action Plan (BCCSAP)
- Addresses adaptation, mitigation, and low-carbon development.
- EA enables carbon accounting through valuation of ecosystem services such as carbon sequestration by forests and wetlands.
- Supports climate-smart policy design.
- e) Nationally Determined Contributions (NDCs)
- EA aids in tracking the carbon mitigation potential of ecosystems.
- Supports policy development for forest conservation, land use management, and wetland protection aligned with NDC targets.

4. Institutional and Policy Mechanisms for Implementation

Bangladesh has made progress in laying the institutional foundation for ecosystem accounting:

- Bangladesh Bureau of Statistics (BBS) is leading the implementation of SEEA frameworks, supported by the UN and World Bank.
- Ministry of Environment, Forest and Climate Change (MoEFCC) plays a critical role in aligning ecosystem accounting with environmental policy.
- Planning Commission integrates environmental sustainability into the national development planning cycle.
- Inter-ministerial coordination mechanisms are being strengthened to ensure that natural capital and ecosystem services are reflected in budgeting and monitoring frameworks.

5. Challenges in Policy Integration

- Lack of consistent ecosystem data and valuation tools
- Insufficient institutional capacity and trained personnel
- Limited awareness among policymakers of EA's policy relevance
- Weak coordination between environmental and economic planning agencies
- Inadequate inclusion of EA outputs in national budget and policy documents

6. Stronger Policy Linkage

- Mainstream ecosystem accounting outputs into the national planning and budgeting process, especially within the Annual Development Program (ADP).
- Institutionalize the SEEA-EA framework across relevant ministries and local government bodies.
- Build technical capacity for data collection, modeling, and valuation of ecosystem services.
- Enhance policy dialogue between planners, economists, and environmental experts to ensure the uptake of EA insights.
- Use EA to inform Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs).
- Support pilot projects and case studies that demonstrate the policy relevance of EA in specific sectors like forestry, water, agriculture, and tourism.

Chapter VIII

Conclusion

Chapter VIII

Conclusion

Bangladesh's forests and ecosystems are vital natural assets that support biodiversity, protect against climate-induced disasters, and provide essential resources for millions of people. The development of Natural Resources Accounts (NRA) for forests and ecosystems marks a critical step in recognizing the economic and environmental value of these resources. Through initiatives like the SEEA (System of Environmental-Economic Accounting), Bangladesh has begun integrating forest and ecosystem data into national planning frameworks. However, deforestation, land degradation, and unplanned development continue to threaten forest ecosystems. Limited data availability, institutional gaps, and lack of awareness hinder the full implementation and use of NRA in policy-making. For the future, we can explore the below recommendations to strengthen Natural Resources Accounts (NRA)-Forest and Ecosystem as it was a baseline, so still the expectations are there to improve in coming days.

1. Strengthen Data Systems and Monitoring
 - Improve forest and ecosystem data collection through remote sensing, GIS, and field surveys.
 - Establish regular monitoring systems to update NRA with accurate and timely data.
2. Institutional Capacity Building
 - Train government officials, planners, and statisticians in ecosystem accounting and natural capital valuation.
 - Strengthen coordination among the Bangladesh Bureau of Statistics (BBS), Ministry of Environment, and Forest Department.
3. Mainstream NRA into Policy and Planning
 - Integrate forest and ecosystem accounts into national development plans, such as the Five-Year Plans and NDCs.
 - Use NRA to inform decisions on land use, forest conservation, climate adaptation, and sustainable resource management.
4. Promote Community Participation and Local Governance
 - Involve local communities in forest monitoring and benefit-sharing schemes to ensure sustainable use and conservation.
 - Support co-management approaches in protected areas.
5. Enhance Legal and Financial Frameworks
 - Enforce policies to prevent illegal logging and encroachment.
 - Introduce incentives for forest conservation, such as payment for ecosystem services (PES) and carbon finance
6. Raise Awareness and Advocacy
 - Conduct awareness campaigns on the value of forests and ecosystems in national development and disaster resilience.
 - Encourage academic and civil society involvement in research and policy advocacy.
7. Data support
 - Try to incorporate the updated data from the Department of Forest and Department of Environment continuously
 - Try to develop a Data base focusing Forest and Ecosystem related statistics and try to include these statistics as an integral part of BBS regular data hub.

By strengthening Natural Resources Accounts for forests and ecosystems, Bangladesh can ensure better governance of its natural capital, foster sustainable development, and build resilience to environmental challenges in the years ahead. Finally, the focus of NRA/NCA (Natural Resource Accounting/Natural Capital Accounting) activities in Bangladesh is to generate valuable new data that supports the country's sustainable development policy priorities. This marks the first step toward building a shared, cost-effective, and sustainable statistical infrastructure under the SEEA framework. To maintain the momentum of these medium-term efforts, ongoing data collection and continuous improvements are essential. NRA/NCA can serve as a foundation for developing detailed project proposals, outlining specific activities and associated funding needs. Resource mobilization should draw from a range of sources—including national initiatives, UN agencies, development partners, and by realigning existing NRA/NCA efforts under SEEA priorities.

In the current report, *2015 & 2023*, baseline data has been developed focusing on the physical assets of forest and other wooded land. However, the report does not yet include detailed accounts for Timber Resources, specifically:

- Physical Assets Accounts for Timber Resources, and
- Monetary Assets Accounts for Timber Resources (in currency units), under the classes of Cultivated Timber Resources and Natural Timber Resources.
- Given the economic and ecological significance of timber resources in the context of sustainable forest management and national natural capital accounting, it is strongly recommended that these components be integrated into the next phase of reporting. The inclusion of these accounts will:
 - Provide a more comprehensive understanding of the forest ecosystem's value and potential;
 - Support informed policy and decision-making regarding forest resource utilization and conservation;
 - Align with the SEEA-CF and SEEA EA frameworks for environmental-economic accounting.

Therefore, it is recommended that Physical and Monetary Accounts for both Cultivated and Natural Timber Resources be developed and included in the subsequent editions of this report, through data collection, estimation methodologies, and stakeholder consultation as necessary.

Annex

Annex 01: (District Data)
SEEA Forest Cover Class 2015 (sq. km)

Sl	District Name	Other Naturally Regenerated Forest	Planted Forest	Other wooded land	Grand Total
01	Bagerhat	1488.22	0.68		1488.90
02	Bandarban	2153.36	1.03	1927.16	4081.54
03	Barguna	22.78	27.73		50.51
04	Barishal		0.00		0.00
05	Bhola		126.16		126.16
06	Bogura		0.00		0.00
07	Brahmanbaria		5.87		5.87
08	Chapainababganj		0.00		0.00
09	Chattogram	411.00	186.53	682.75	1280.28
10	Cox's Bazar	67.25	139.51	471.56	678.32
11	Cumilla	1.20	22.92		24.12
12	Dhaka	0.24	0.21		0.45
13	Dinajpur	16.20	15.92		32.12
14	Feni		8.06		8.06
15	Gazipur	78.47	56.72	0.42	135.61
16	Habiganj	50.73	38.92	49.22	138.88
17	Jamalpur		7.26	2.21	9.47
18	Jhalokati		0.31		0.31
19	Khagrachhari	1025.06	0.03	1353.99	2379.08
20	Khulna	1459.75	1.12		1460.86
21	Moulvibazar	82.15	224.37	26.19	332.71
22	Mymensingh	13.09	16.06	0.83	29.98
23	Naogaon	1.96	10.66		12.62
24	Netrakona	1.03	3.85	4.49	9.37
25	Noakhali		145.89		145.89
26	Panchagarh	0.14			0.14
27	Patuakhali		131.23		131.23
28	Pirojpur		1.58		1.58
29	Rangamati	3064.80	0.00	1535.05	4599.85
30	Rangpur	0.60	3.96		4.56
31	Satkhira	1027.15	2.29		1029.44
32	Sherpur	4.85	30.30	24.01	59.16
33	Sunamganj		1.25	0.76	2.02
34	Sylhet	5.24	35.11	35.12	75.46
35	Tangail	66.33	95.97		162.31
36	Thakurgaon	2.22			2.22
	Grand Total	11043.83	1341.48	6113.77	18499.08

SEEA Forest Cover Class 2023 (sq. km)

Sl	District Name	Other Naturally Regenerated Forest	Planted Forest	Other wooded land	Grand Total
1	Bagerhat	1484.40	4.45		1488.86
2	Bandarban	2185.05	54.30	1575.34	3814.68
3	Barguna	21.59	37.48		59.07
4	Bhola		144.83		144.83
5	Brahmanbaria		4.65		4.65
6	Chattogram	368.75	250.72	495.36	1114.83
7	Chuadanga		0.01		0.01
8	Cox's Bazar	82.96	232.74	321.11	636.81
9	Cumilla	1.54	19.81		21.35
10	Dhaka	0.41	0.52		0.94
11	Dinajpur	22.88	13.31		36.18
12	Feni		8.18		8.18
13	Gazipur	80.00	52.98	0.79	133.76
14	Habiganj	25.47	88.18	27.79	141.44
15	Jamalpur		7.30	2.16	9.47
16	Jhalokati		0.57		0.57
17	Khagrachhari	950.59	14.36	1100.76	2065.71
18	Khulna	1430.36	1.03		1431.39
19	Kishoreganj		0.05		0.05
20	Laalmonirhat		0.38		0.38
21	Moulvibazar	72.76	240.97	25.36	339.09
22	Mymensingh	19.44	9.45	0.16	29.06
23	Naogaon	2.32	6.19		8.50
24	Narayanganj	0.00			0.00
25	Netrakona	0.99	4.16	3.47	8.62
26	Nilphamari		2.09	0.41	2.50
27	Noakhali	0.03	167.89	0.00	167.92
28	Panchagarh	1.56	0.36	0.02	1.94
29	Patuakhali		168.30		168.30
30	Pirojpur		2.23		2.23
31	Rajshahi		1.30		1.30
32	Rangamati	3050.04	3.70	1293.00	4346.73
33	Rangpur	1.31	5.86		7.17
34	Satkhira	1001.36	6.01		1007.36
35	Shariatpur		0.00		0.00
36	Sherpur	4.78	33.13	20.94	58.85
37	Sunamganj		3.80	1.98	5.78
38	Sylhet	8.19	31.13	26.32	65.63
39	Tangail	71.34	85.92	4.27	161.53
40	Thakurgaon	2.20	0.17	0.12	2.49
	Grand Total	10890.30	1708.53	4899.35	17498.18

Annex 02: Committees

01. Project Steering Committee (PSC)

SL. No.	Name, Designation and Office (Not according to seniority)	Designation in the Committee
1.	Secretary, Statistics and Informatics Division, Ministry of Planning	Chairperson
2.	Director General, Bangladesh Bureau of Statistics (BBS)	Member
3.	Additional Secretary (Development), Statistics and Informatics Division, Ministry of Planning	Member
4.	Representative, Finance Division, Ministry of Finance	Member
5.	Representative, Implementation Monitoring and Evaluation Division (IMED)	Member
6.	Representative, Socio-Economic Infrastructure Division, Planning Commission	Member
7.	Representative, Programming Division, Planning Commission	Member
8.	Representative, General Economic Division (GED), Planning Commission	Member
9.	Representative, NEC-ECNEC and Coordination, Planning Commission	Member
10.	Representative, Ministry of Environment, Forest and Climate Change	Member
11.	Representative, Ministry of Disaster Management and Relief (MoDMR)	Member
12.	Representative, Ministry of Power, Energy and Mineral Resources	Member
13.	Representative, Ministry of Water Resources	Member
14.	Representative, Ministry of Agriculture	Member
15.	Director, National Accounting Wing, Bangladesh Bureau of Statistics (BBS)	Member
16.	Project Director, ECDS Project, Bangladesh Bureau of Statistics (BBS)	Member
17.	Deputy Secretary (Development), Statistics and Informatics Division (SID)	Member Secretary

02. Project Implementation Committee (PIC)

Sl. No.	Name, Designation and Office (Not according to seniority)	Designation in the Committee
1.	Director General (DG), Bangladesh Bureau of Statistics (BBS)	Chairman
2.	Additional Secretary (Development), Statistics and Informatics Division, Ministry of Planning	Member
3.	Deputy Director General, Bangladesh Bureau of Statistics (BBS)	Member
4.	Representative, Finance Division, Ministry of Finance	Member
5.	Representative, Implementation Monitoring and Evaluation Division (IMED)	Member

Sl. No.	Name, Designation and Office (Not according to seniority)	Designation in the Committee
6.	Representative, Socio-Economic Infrastructure Division, Planning Commission	Member
7.	Representative, Programming Division, Planning Commission	Member
8.	Representative, General Economic Division (GED), Planning Commission	Member
9.	Representative, NEC-ECNEC and Coordination, Planning Commission	Member
10.	Representative, Ministry of Environment, Forest and Climate Change	Member
11.	Representative, Ministry of Disaster Management and Relief (MoDMR)	Member
12.	Representative, Ministry of Power, Energy and Mineral Resources	Member
13.	Representative, Ministry of Water Resources	Member
14.	Representative, Ministry of Agriculture	Member
15.	Representative, Ministry of Agriculture	Member
16.	Director, National Accounting Wing, Bangladesh Bureau of Statistics (BBS)	Member
17.	Project Director, ECDS Project, Bangladesh Bureau of Statistics (BBS)	Member Secretary

3. Project Technical Committee (PTC)

SL. No.	Name, Designation and Office (Not according to seniority)	Designation in the Committee
1)	Director General, Bangladesh Bureau of Statistics (BBS)	Chairperson
2)	Additional Secretary (Development), Statistics and Informatics Division, Ministry of Planning	Member
3)	Deputy Director General, Bangladesh Bureau of Statistics (BBS)	Member
4)	Dr. A. Atiq Rahman, Executive Director, Bangladesh Centre for Advanced Studies (BCAS), Dhaka.	Member
5)	Professor Dr. A. K. Enamul Haque, Department of Economics, East West University, Dhaka	Member
6)	Professor Dr. Syed Shahadat Hussain, Institute of Statistical Research and Training (ISRT), University of Dhaka, Dhaka	Member
7)	Professor Dr. Bazlul Haque Khondker, Chairman of the South Asian Network on Economic Modeling (SANEM) and Former Professor, Department of Economics, University of Dhaka	Member
8)	Deputy Secretary (Development), Statistics and Informatics Division (SID)	Member
9)	Professor Dr. M Manzurul Hassan, Department of Geography and Environment, Jahangirnagar University.	Member

SL. No.	Name, Designation and Office (Not according to seniority)	Designation in the Committee
10)	Professor Dr. Muhammad Shahadat Siddiquee, Department of Economics, University of Dhaka	Member
11)	Professor Dr. Md. Faruk Hossain, Department of Geography and Environment, Associate Professor, University of Dhaka.	Member
12)	Mr. Md. Mostafizur Rahman, Principal Specialist and Director, Centre for Environmental and Geographic Information System (CEGIS)	Member
13)	Dr. Md. Abdus Salam, Chief Scientific Officer, Space Research and Remote Sensing Organization (SPARRSO), Ministry of Defense	Member
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27)	Mr. Md. Rafiqul Islam, Director (IC), National Accounting Wing, Bangladesh Bureau of Statistics (BBS)	Member
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