Solomon Island’s

First Biennial Transparency Report

Under the Solomon Island’s First Biennial Transparency Report to United Nations Framework Convention on Climate Change (UNFCCC)

Submitted by:

Climate Change Division

Ministry of Environment, Climate Change, Disaster Management and Meteorology, Government of Solomon Islands

May– 2025

EXECUTIVE SUMMARY

I. National Circumstances and Institutional Arrangements

The Solomon Islands, a small island developing state in the South Pacific, comprises over 990 islands with rich biodiversity, extensive forest cover, and significant exposure to climate risks. This section of the BTR1 outlines the country's geographic, socio-economic, and institutional context, and describes the robust arrangements in place for climate governance and greenhouse gas (GHG) inventory development and reporting.

a. Geography, Climate, and Demography

The Solomon Islands spans a land area of 28,900 km^2 across nine provinces and around 90 inhabited islands. Its terrain includes coral atolls, volcanic mountains, and low-lying coastlines, with approximately 80–85% of its landmass covered by forests. The country's climate is tropical with year-round high humidity, minimal temperature fluctuation, and significant annual rainfall (3,000–3,500 mm). It lies in the Pacific Ring of Fire and is prone to natural hazards such as earthquakes, cyclones, floods, and tsunamis. Climate change has exacerbated these vulnerabilities through increased heatwaves, rainfall variability, and sea-level rise (projected between 17–37 cm by 2050).

The 2019 Census reports a population of 720,956, growing at 2.6% annually. A large rural population (72.4%) depends on subsistence farming. The Human Development Index (HDI) improved from 0.475 (2000) to 0.567 (2019), yet it remains below the regional average.

b. Economy

The Solomon Islands' economy is primarily based on agriculture, forestry, fisheries, and mining. In 2023, logging, minerals, and fisheries made up 84% of exports. Agriculture engages 90% of households, while tourism and mining are emerging contributors. However, geographic isolation, climate vulnerability, and dependence on natural resources constrain economic resilience. Disasters such as the 2014 flash floods and the COVID-19 pandemic have had significant economic impacts.

c. Enabling Environment

The country ratified the UNFCCC in 1994, the Kyoto Protocol in 2004, and the Paris Agreement in 2016. A Climate Change Division was established within the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) in 2008, marking a turning point in institutionalizing climate action. Other key institutions include the Climate Change Finance Unit, REDD+ Unit, and sectoral focal points across line ministries.

d. Institutional Framework

Solomon Islands operates under a Westminster-style democratic system. Climate governance is centralized in the MECDM, which houses four technical divisions: Environment & Conservation, Climate Change, Disaster Management, and Meteorological Services. Provincial and local governance structures also play a role in development planning, including climate-related mandates.

Climate mitigation is mainstreamed across key ministries. A Project Steering Committee and Technical Working Groups (TWGs) oversee national GHG inventory development and reporting. Formal inventory approval involves stakeholder consultations, quality reviews, and Cabinet endorsement.

e. National Climate Policies and Strategies

A comprehensive suite of policies supports climate governance, including:

- National Climate Change Policy (NCCP) 2023–2032
- National Adaptation Programme of Action (NAPA) 2008
- Nationally Determined Contribution (NDC) 2021
- Low Emissions Development Strategy (LEDS)
- Relocation Guidelines (2022)

These align with international commitments under the Paris Agreement, UNFCCC, and relevant regional frameworks such as the Framework for Resilient Development in the Pacific (FRDP).

f. Mainstreaming Climate Change

Climate resilience is integrated into the country's long-term National Development Strategy (2016–2035). The fourth objective of the NDS explicitly focuses on building resilience, supported by climate mainstreaming across sectors and the establishment of a Monitoring, Reporting and Verification (MRV) framework. There are plans to extend climate frameworks to provincial levels.

g. Regional and International Engagement

Solomon Islands' national frameworks are harmonized with:

- Regional frameworks: FRDP, PIFACC, PDDFA
- International frameworks: Paris Agreement, Sendai Framework for DRR

This multi-level engagement enhances coherence between local actions and global commitments.

h. Key Sectoral Contexts

- Agriculture: Dominated by subsistence farming, vulnerable to climate extremes, and supported by several sector-specific policies.
- Fisheries: A critical export sector (mainly tuna), facing sustainability and climate threats.
- Forestry: Main export contributor but facing overexploitation; sustainable logging policies are underway.
- Energy: Predominantly diesel-based with growing investment in renewables; the goal is 100% renewable electricity by 2030.
- Water: Access to clean water remains low, especially in rural areas. Saltwater intrusion and poor infrastructure are major challenges.

II. National Greenhouse Gas Inventory

This section of the Biennial Transparency Report presents the Solomon Islands' National Greenhouse Gas (GHG) Inventory for the reporting year 2022, as well as time series data from 1994 to 2022. It has been prepared in accordance with the Modalities, Procedures and Guidelines (MPGs) (decision 18/CMA.1) and decision 5/CMA.3, for the Enhanced Transparency Framework under the Paris Agreement, and the 2006 IPCC Guidelines for National GHG Inventories.

a. Sectors and gases

The inventory covers the following sectors:

1. Energy
2. Industrial Processes and Product Use (IPPU)
3. Agriculture
4. Forestry and Land Use (AFOLU), and
5. Waste

The reference approach has also been used to estimate equivalent CO_2 emissions from the energy sector for the time series 1994-2022.

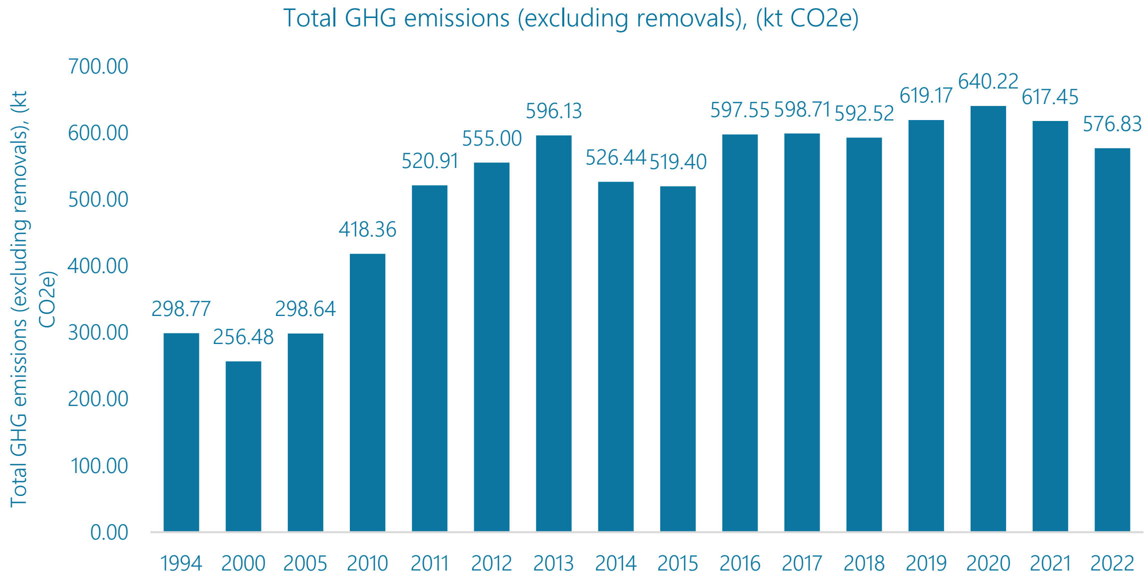
It includes emissions of CO_2, CH_4, N_2O, and HFCs. PFCs, SF_6, and NF_3 are not applicable due to negligible or no emissions. Indirect gases (NOx, CO, NMVOCs, SO_2) from the energy sector are also estimated.

Emissions are reported as CO_2 equivalents (CO_2 eq) using 100-year Global Warming Potential (GWP) values from the IPCC Fifth Assessment Report (AR5). The Tier 1 methodology and default emission factors from the IPCC Guidelines were applied throughout the inventory.

b. Key Findings and Emissions Trends

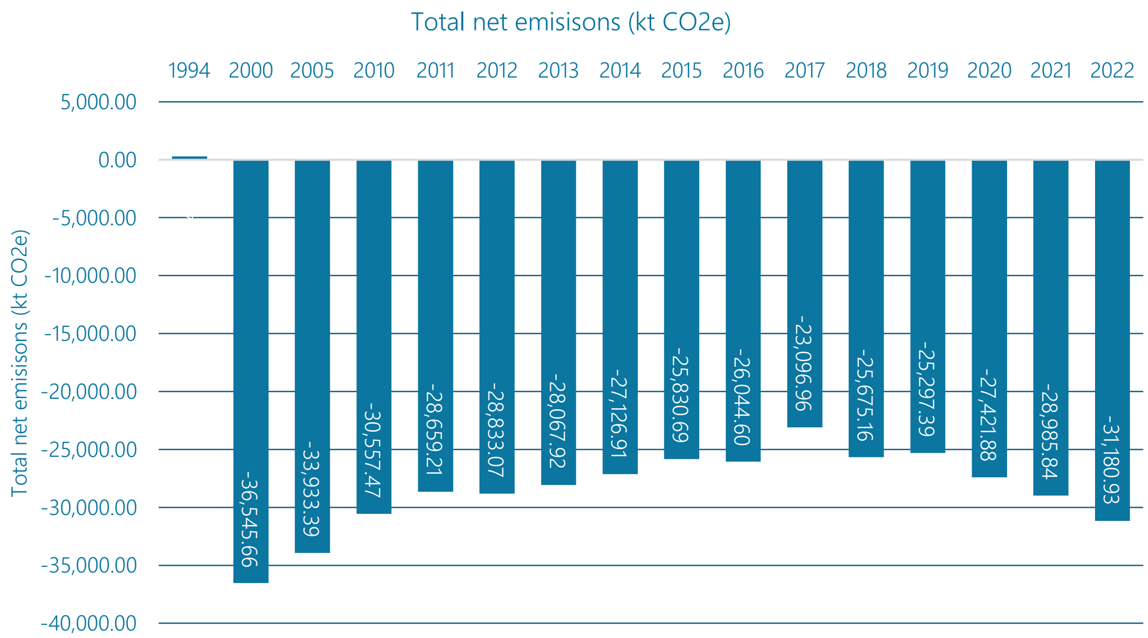
Solomon Islands reported total GHG emissions of 576.96 kt CO_2 eq in 2022 (excluding removals).

Figure ES 2.1: Total GHG emissions (excluding removals) per year, kt CO_2 eq



Solomon Islands is net carbon negative, since the Forestry and Other Land Use (FOLU) sector is a net sink of CO_2 in Solomon Islands. the net GHG emissions amounted to –31,180.93 kt CO_2 eq.

Figure ES 2.2: Total net GHG emissions per year, kt CO_2 eq

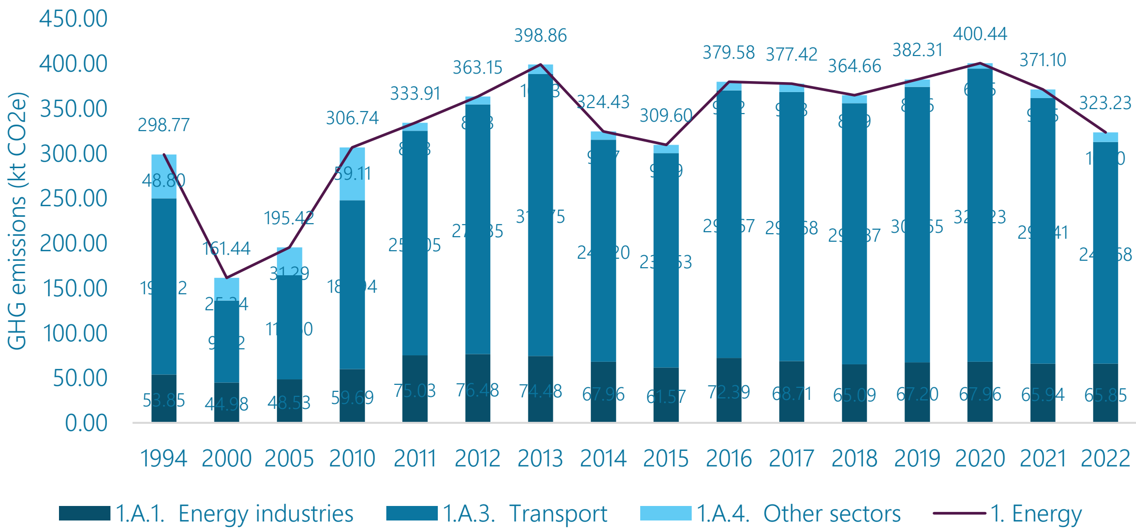


c. Energy Sector

In 2022, the Energy sector emissions in Solomon Islands are mainly occurring due to the activities related to Fuel Combustion (category 1.A). The fuel combustion activities comprise of the following subcategories:

- 1.A.1. Energy Industries (20.37%)
- 1.A.3 Transport (76.32%)
- 1.A.4 Other sectors (Commercial/Institutional, Residential) (3.31%).

Figure ES 2.3: Energy Sector Emissions (kt CO_2 eq): 1994-2022



d. Industrial Processes and Product Use (IPPU)

Under the Industrial Processes and Product Use (IPPU), the GHG emissions occurring from the following categories are estimated in this inventory

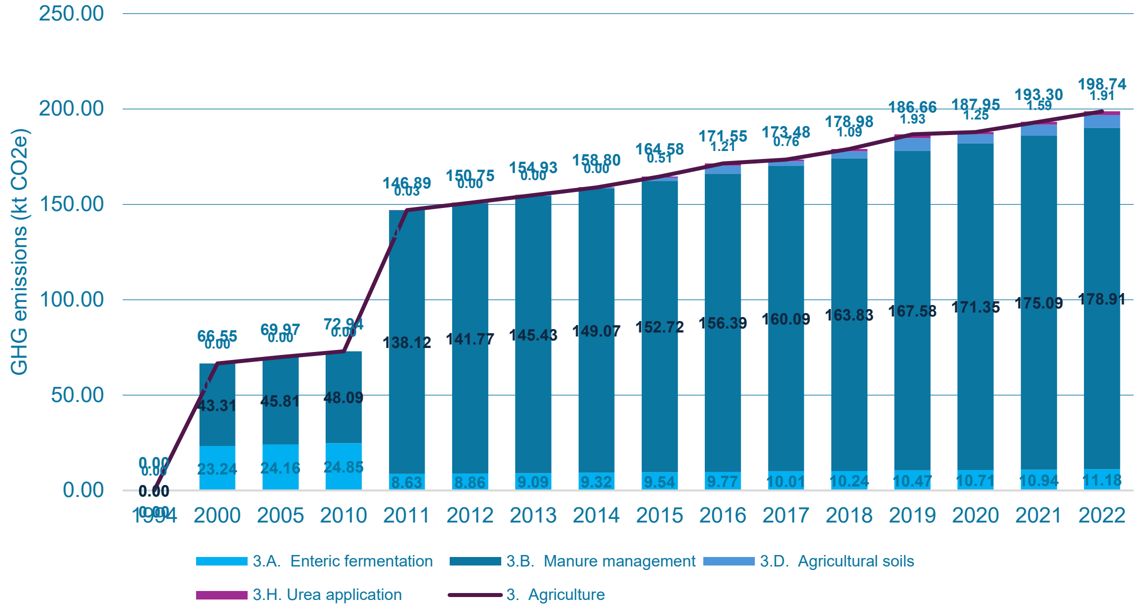
- 2D Non-energy products from fuels and solvent use – The emissions from Lubricant Use (2.D.1) were 0.49 kt CO_2 eq in 2022.
- 2F Product uses as substitutes for ODS – The emissions from 2.F.1 Refrigeration and Air Conditioning category 0.0021 kt CO_2 eq in 2022

e. Agriculture sector

The agriculture sector is the second largest GHG emission sector in Solomon Islands and also the largest source of CH_4 and N_2O. In 2022, the agriculture sector emissions were 198.74 kt CO_2 eq which is about 34.45% of the total national GHG emissions (excluding removals).

In 2022, Manure management was the main source of Agriculture emissions, contributing around 90.02% of the sector's emissions, followed by Enteric fermentation (5.63%), Agricultural soils (3.39%) and remaining 0.96% from Urea application respectively.

Figure ES 2.4: Agriculture sector GHG emissions (kt CO_2 eq): 2000-2022



f. Land use, land-use change and forestry (LULUCF)

Solomon Islands had 2,529.64 kha of under forest land in year 2000, extending over 90.29% of its land area. However, the estimated area of forest land in 2022 is approximately 2,516.37 kha, representing about 89.82% of its total land area.

In 2022, net CO_2 emissions from LULUCF sector were -31,757.76 kt CO_2 eq

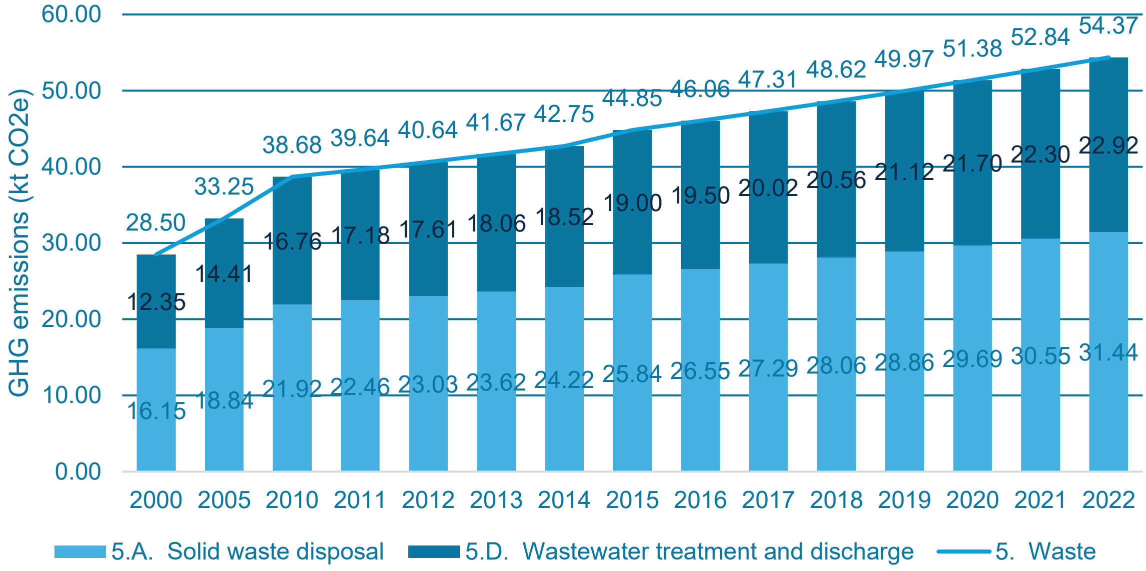
g. Waste sector

In Solomon Islands, the waste sector covers methane (CH_4) and nitrous oxide (N_2O) from the following key categories:

- 5.A. Solid waste disposal
- 5.D. Wastewater treatment and discharge (mainly Domestic wastewater handling since there is no industrial wastewater generation)

In 2022, the waste sector emissions were 54.37 kt CO_2 eq viz about 9.42 % of the total national GHG emissions. The GHG emissions from Solid waste disposal emissions is about 31.44 kt CO_2 eq (58% of the sectoral emissions) are wastewater treatment and discharge emissions are 22.92 kt CO_2 eq (42% of the sectoral emissions).

Figure ES 2.5: Waste sector GHG emissions (kt CO_2 eq): 2000-2022



h. Key Category Analysis

Solomon Islands has identified the following sectors as the key categories (without considering LULUCF sector in the analysis) to the total national GHG emissions and presented in table ES 1 (level assessment) and table ES 2 (trend assessment):

Table ES 1: Key Category Analysis (KCA) results (without LULUCF sector): Level assessment

Category code	Category	Greenhouse gas	Level Assessment (%)	Cumulative (%)
3.B	Manure Management	METHANE (CH_4)	27%	26.8%
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	23%	49.4%
1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	16%	65.7%
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	11%	77.1%
5.A	Solid Waste Disposal	METHANE (CH_4)	5%	82.5%
3.B	Manure Management	NITROUS OXIDE (N_2O)	4%	86.7%
1.A.3.a	Civil Aviation	CARBON DIOXIDE (CO_2)	3%	89.9%
5.D	Wastewater Treatment and Discharge	METHANE (CH_4)	2%	92.1%
3.A	Enteric Fermentation	METHANE (CH_4)	2%	94.1%
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	2%	95.9%

Table ES 2: Key Category Analysis (KCA) results (without LULUCF sector): Trend assessment

1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	52%	52%
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	24%	76%
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	15%	92%
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	7%	99%

When the LULUCF sector is included in the analysis, the most significant key categories are Forest Land remaining Forest Land (4A1) using level assessment. While for trend assessment 1.A.3.b Road Transportation, 1.A.4 Other Sectors and 1.A.1 Energy Industries are the key categories. The full analysis is detailed in Annex I of this Report.

III. Tracking Progress on the Nationally Determined Contributions (NDCs)

The Solomon Islands' Biennial Transparency Report presents detailed information on how the country is progressing in implementing and achieving its NDCs, aligned with Article 4 of the Paris Agreement and in accordance with the Modalities, Procedures, and Guidelines (MPGs) of the Enhanced Transparency Framework (ETF). This section highlights the NDC targets, indicators, accounting approaches, methodologies, and implementation challenges as well as strategic policy directions.

a. NDC Description and Targets

The Solomon Islands updated its NDC in 2021, reflecting increased ambition and expanded scope. The country committed to the following mitigation targets:

- Unconditional Target:
  - 14% reduction in GHG emissions by 2025 below 2015 levels
  - 33% reduction by 2030
- Conditional Target:
  - Additional 27% reduction by 2025 and 45% by 2030 compared to business-as-usual (BaU)
- Long-Term Vision:
  - Achieve net-zero emissions by 2050 with international support

Key sectors covered include energy, transport (land and sea), agriculture, forestry, and land use (AFOLU), along with emerging action in coastal and marine ecosystems.

b. Indicators for Tracking Progress

Progress toward these targets is monitored using a set of quantifiable indicators, including:

- GHG Emissions (excl. LULUCF): 519.02 kt CO_2 eq in 2015 (base year)
- Renewable Energy Generation (Honiara grid): 2% in 2015, targeting 100% by 2030
- Electricity Access: 76% population access in 2024, with goals for urban (80%) and rural (40%) areas by 2025
- Energy Efficiency: Targeting a 10% improvement across sectors by 2030
- Renewables in Urban & Rural Electricity Mix: Aiming for 50% by 2030

These indicators help assess both mitigation outcomes and structural transformations in key sectors.

c. Methodologies and Accounting Approaches

The GHG emissions and removals are estimated following the 2006 IPCC Guidelines, ensuring methodological consistency and transparency. The Solomon Islands employs absolute GHG reductions (in kt CO_2 eq) as the core metric for NDC tracking.

d. Progress and Challenges

While notable advancements include institutional reforms, renewable energy initiatives, and consistent net-negative emissions due to forest sinks, the Solomon Islands remains behind in achieving its NDC milestones.

Key challenges include:

- Inadequate access to climate finance
- Limited technical and institutional capacities
- Infrastructure and technology deployment gaps
- Delays in implementing conditional measures

e. Mitigation Policies and Plans

To support NDC implementation, several strategic frameworks are in place:

- National Climate Change Policy (2023–2032)
- Low Emission Development Strategy (LEDS) 2023

- National Development Strategy (NDS) 2016–2035)

The LEDS provides a roadmap to 2050, outlining 18 mitigation steps across energy, transport, forestry, agriculture, and livestock. These include:

- Scaling up hydropower and solar generation
- Promoting electric vehicles
- Sustainable forest management
- Organic agriculture promotion

Gender mainstreaming and the establishment of a National Climate Change Trust Fund are also prioritized.

f. Use of Market Mechanisms

The country expresses intent to participate in cooperative approaches under Article 6 of the Paris Agreement to mobilize international climate finance and strengthen mitigation.

g. Assessment and Way Forward

Despite strong policy intent, achieving the NDC depends on enhanced international support. Priority actions include:

- Climate finance access
- Technology transfer
- Capacity building
- Operationalization of the Climate Trust Fund
- Strengthening national GHG data systems, including the iMRV platform

This section demonstrates the Solomon Islands' alignment with global climate goals and underscores the need for robust support systems to meet its ambitious NDC trajectory.

IV. Climate Change Impacts and Adaptation under Article 7

This section of the BTR outlines Solomon Islands' exposure to climate risks, observed and projected climate impacts, and national efforts to build resilience and adapt. The Solomon Islands faces intensified climate hazards, including sea-level rise, temperature increases, ocean acidification, storm surges, coastal erosion, and extreme events that threaten ecosystems, food and water security, health, and infrastructure.

a. National Circumstances, Institutional Arrangements and Legal Framework

The Solomon Islands is highly vulnerable to climate change due to its geography, fragile ecosystems, high population growth, and economic dependence on natural resources. Institutional arrangements are led by MECDM and guided by national frameworks such as the National Climate Change Policy (2023–2032) and the National Adaptation Programme of Action (NAPA, 2008).

b. Climate Trends and Vulnerability

Climate projections show increased temperatures, intensified rainfall, and rising sea levels. Vulnerabilities span across sectors such as:

- Agriculture & Food Security: Threatened by erratic rainfall, flooding, and saltwater intrusion.
- Water & Sanitation: At risk due to coastal source contamination.
- Health: Increased climate-related diseases, especially affecting women and children.
- Infrastructure: Disruption from extreme weather events.

c. Adaptation Priorities, Actions, and Barriers

Key priority sectors for adaptation include agriculture, water, health, education, waste, tourism, fisheries, coastal protection, and infrastructure. Actions include early warning systems, climate-resilient infrastructure, and community-based projects like SWoCK and CRISP. Despite progress, barriers include limited finance, data, institutional coordination, and technical capacity.

d. Integration into National Policies

Climate adaptation is embedded in the NDS (2016–2035), with key strategies such as the NDMP (2018) and the NCCP (2023–2032). These documents promote decentralization, community engagement, and alignment with SDGs and Sendai Framework.

e. Implementation Progress and M&E

Implementation includes developing an NDC Investment Plan linking mitigation and adaptation, with sector-specific projects. Monitoring is supported by an M&E Framework integrated into NDS reporting. Adaptation outcomes are evaluated for effectiveness, resilience, and community benefits.

f. Addressing Loss and Damage

Loss and damage (L&D) are increasingly critical. Examples include submerged islands and displaced communities. The NCCP (2023–2032) dedicates a specific objective to address L&D, emphasizing mobilization of resources and community recovery support.

g. Use of Science and Traditional Knowledge

Adaptation efforts integrate Indigenous Knowledge Systems through initiatives like SIIVA and IVAs. Participatory processes ensure representation of women, youth, and vulnerable groups in planning and implementation.

h. Cooperation and Lessons Learned

Solomon Islands leverages partnerships with UNDP, IOM, and bilateral donors to scale up adaptation. Key lessons emphasize local engagement, mainstreaming, and institutional synergies to overcome remote geography and implementation barriers.

V. Financial, Technology Development and Transfer, and Capacity-Building Support (Articles 9–11)

This section presents a detailed overview of the Solomon Islands' needs, priorities, and support received for climate finance, technology development and transfer, and capacity-building, in accordance with Articles 9–11 of the Paris Agreement. It highlights national strategies, institutional mechanisms, key initiatives, and gaps that hinder progress in achieving climate goals.

a. National Strategies and Institutional Framework

The Solomon Islands has progressively developed its institutional framework for climate finance, culminating in the formulation of a Climate Finance Roadmap (2022) and the establishment of a National Climate Finance Steering Committee, co-chaired by MECDM and MoFT. The government has proposed a Climate Finance Resilience Unit (CFRU) to improve access, management, and coordination of resources.

With assistance from the Pacific NDC Hub and the Global Green Growth Institute (GGGI), an NDC Investment Plan has been developed, identifying priority mitigation and adaptation actions in renewable energy, land transport, forestry, and waste. The investment requirement totals USD 242.5 million, including USD 224.7 million for capital investments and USD 17.7 million for development and capacity building.

b. Financial Support Needed and Received (Article 9)

The 2021 NDC identifies a total financing need of approximately USD 369 million, broken down as:

- Adaptation: USD 126.7 million (for NAP and NAPA revisions) and USD 109.4 million for further priority adaptation actions.
- Mitigation: USD 133 million, primarily in energy, forestry, and transport sectors.

Between 2002 and 2021, the Solomon Islands received an estimated USD 340 million in climate-related development finance:

- 61% for mitigation, 38% for adaptation, and 1.6% for cross-cutting issues.

Significant sources of funding include:

- Green Climate Fund (GCF): USD 86 million
- Adaptation Fund: USD 7.7 million
- GEF, JICA, and bilateral donors: Smaller but targeted contributions

Despite substantial pledges, challenges persist in fund access, disbursement bottlenecks, absorptive capacity, and alignment with national priorities.

c. Technology Development and Transfer (Article 10)

Supported by UNEP and the GEF, a Technology Needs Assessment (TNA) identified priority technologies in two focus areas:

- Mitigation: Sustainable transport, forestry, energy efficiency, and renewable energy
- Adaptation: Coastal protection, early warning systems, resilient agriculture, and relocation planning

Key technologies and initiatives supported include:

- Tina River Hydropower Project (15 MW)
- Solar mini-grids and hybrid systems in remote areas
- Electric outboard motors and e-mobility feasibility studies
- Climate information and early warning systems
- Nature-based solutions: Coral reef and mangrove restoration
- CTCN support for climate-resilient agriculture

d. Capacity-Building Support (Article 11)

Capacity-building is critical to Solomon Islands' ability to plan, implement, and report climate actions. Identified needs cover:

- Institutional coordination across ministries
- GHG data collection, management, and reporting systems
- Community and provincial-level awareness and resilience planning

The 2021 NDC outlines 15 priority capacity-building actions, including:

- Development of a National Adaptation Plan (NAP)
- Gender-responsive planning
- Integrating Indigenous and Local Knowledge (ILK)
- Strengthening national MRV and ETF systems

Support received includes:

- CBIT (FAO): Building institutional and technical capacity for ETF reporting
- UN-REDD, CRISP, CCCPIR, IACT, J-PRISM: Supporting forest monitoring, waste management, export readiness, and mainstreaming climate change

e. Key Challenges and Opportunities

Despite notable progress, Solomon Islands faces several persistent barriers:

- Limited national technical expertise and institutional capacity
- Complex procedures to access multilateral climate funds
- Need for tailored readiness and preparatory support
- Inadequate long-term support for implementation and monitoring

Looking forward, the country emphasizes:

- Enhancing access to a broader mix of financial instruments (grants, concessional loans, guarantees, etc.)
- Operationalizing the CFRU and strengthening MECDM and MoFT coordination
- Scaling up technical assistance, especially for project preparation
- Establishing long-term partnerships with development agencies and donors

ABBREVIATIONS

AFOLU	Agriculture, Forestry and Other Land Use
BaU	Business-as-Usual
BTR	Biennial Transparency Report
CCD	Climate Change Division
CH_4	Methane
CO	Carbon Monoxide
CO_2 eq	Carbon Dioxide equivalent (also for CO_2 eq)
COP	Conference of the Parties
CRT	Common Reporting Tables
CTF	Common Tabular Formats
DRM	Disaster Risk Management
EEZ	Exclusive Economic Zone
EM-DAT	Emergency Event Database
ENSO	El Niño Southern Oscillation
ETF	Enhanced Transparency Framework
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
kt	kilotonnes
GHG	Greenhouse Gas
GSI	Government of Solomon Islands
GWP	Global Warming Potential
HFCs	Hydro Fluorocarbons
ICT	Information and Communications Technology
iMRV	Integrated Monitoring, Reporting and Verification
IPCC	Intergovernmental Panel on Climate Change

IPPU	Industrial Processes and Product Use
LDC	Least Developed Country
LEDS	Long-Term Low Emissions Development Strategy
LPG	Liquefied Petroleum Gas
MAL	Ministry of Agriculture and Livestock
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MHMS	Ministry of Health and Medical Services
MMERE	Ministry of Mines, Energy, and Rural Electrification
MPG	Modalities Procedures and Guidelines
NAPA	National Adaptation Programme of Action
NCCP	National Climate Change Policy
NDC	Nationally Determined Contribution
NDS	National Development Strategy
N_2O	Nitrous Oxide
NGOs	Non-Governmental Organizations
NMVOC	Non-methane volatile organic compounds
Nox	Oxides of Nitrogen
NSO	National Statistics Office
PA	Paris Agreement
RWSSP	Rural Water Supply and Sanitation Programme
SIEA	Solomon Islands Electricity Authority
SIWA	Solomon Islands Water Authority
TNC	Third National Communication
UNCTAD	United Nations Conference on Trade and Development / UN Trade and Development
UNFCCC	United Nations framework Convention on Climate Change

TABLE OF CONTENTS

I. National Circumstances and Institutional Arrangements

1.1. Geography Climate and Demography

1.1.1. Geography

The Solomon Islands is an archipelago of 994 islands which lies in the South Pacific Ocean. The country has a total land area of about 28,900 km^2. Geologically, the islands are part of the volcanic arc extending from New Ireland in Papua New Guinea to Vanuatu. The two main islands have volcanoes on them and the smaller ones are covered with palm trees and sand. The country's geography is a diverse mix of coral atolls, volcanic mountains, islands and salt-water lagoons.

Figure 1: The Physical Map of Solomon Islands showing major geographical features and other topographic features.[1]

[1] https://www.ezilon.com/maps/oceania/solomon-islands-physical-maps.html

Flat land is restricted to the coast and is of a limited extent, except in the north central part of Guadalcanal. These plains, rich in alluvium soil, have been developed for large-scale agriculture and are referred to as the Guadalcanal Plains. Approximately 80-85% of the country's total land area is covered by natural forest (UNDRR, 2023). The islands also have a few rivers such as Lunga, Tenaru and Matanikau, Waikoto being the longest. Fresh water makes up for 62% of arable land on the islands (WorldAtlas , 2023).

The country has rich biodiversity with various unique species of plants, animals, and marine life. However, out of 223 species of birds, 82% are endemic (UNDRR, 2023). Land degradation and deforestation are serious concerns in the Solomon Islands, as logging is a key source of revenue for the country but also a significant driver of biodiversity loss. Coral reefs surround many of the islands, providing vital marine habitats and opportunities for local economy. The reefs, however, are under threat due to overfishing, pollution, particularly the effects of coral bleaching as a result of changing climate and ocean temperatures.

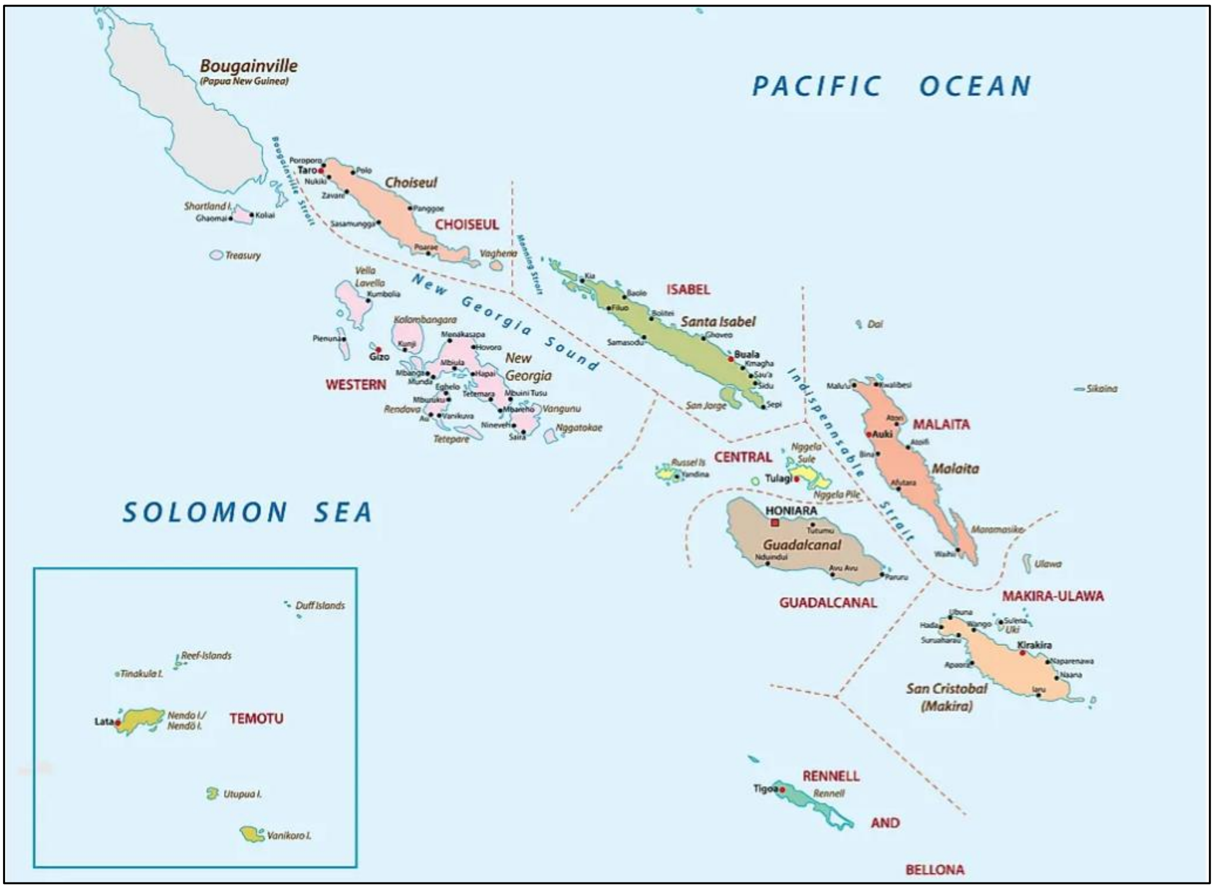


Figure 2: Solomon Island Provinces Map[2]

With its capital in Honiara, the entire country is divided into 9 provinces and the population dispersed across 90 inhabited islands. Major islands include Guadalcanal, Malaita, Choiseul, New Georgia, and Santa Isabel, with Guadalcanal being the largest and most developed. The country

[2] https://www.worldatlas.com/maps/solomon-islands

is one of the most vulnerable to climate change, with nearly 90% of the population living within 5 kilometers (km) of the coastline.

The islands' precarious location along the 'Pacific Ring of Fire' and within the cyclone belt make it highly prone to natural hazards such as volcanic eruptions, tropical cyclones, earthquakes, tsunamis, landslides, floods and droughts. The overarching largest threat, however, is the growing impact of climate change which not only exasperates the existing vulnerability but also threatens to increase the frequency and severity of natural disasters in the Solomon Islands. This is evident from 2014, flash flooding in Guadalcanal Province was estimated to have displaced 10,000 people and caused damages and losses equivalent to 9% of the country's GDP (WBG, 2021).

1.1.2. Climate

1.1.2.1. Temperature

Solomon Islands has tropical climate with high humidity and warm temperatures throughout the year. Average temperatures in the Solomon Islands range between 25°C to 30°C year-round. The islands experience minimal temperature variation, with slightly cooler months between June and August, and warmer months between November and April during the wet season. Humidity levels are high, often exceeding 80%, contributing to the feeling of warmth throughout the year. The Solomon Islands' climate is also affected by the El Niño Southern Oscillation (ENSO), which can lead to prolonged droughts during El Niño years and excessive rainfall during La Niña years.

1.1.2.2. Precipitation

As it is located in the tropical belt the islands receive abundant rainfall, averaging between 3,000–3,500 mm (120–140 inches) a year. Precipitation occurs throughout the year. The graphs below show the monthly mean temperatures and precipitation amounts for the country for the period 1991-2022. As observed in the graph, precipitation is highest from January to March and decreases slightly from May to November, still within the range of 200-250 mm (8- 10 inches) per month. This indicates a wet season at the beginning of the year and a drier period from mid-year. The wet season coincides with the South Pacific cyclone season, causing heavy rainfall and occasional storms.

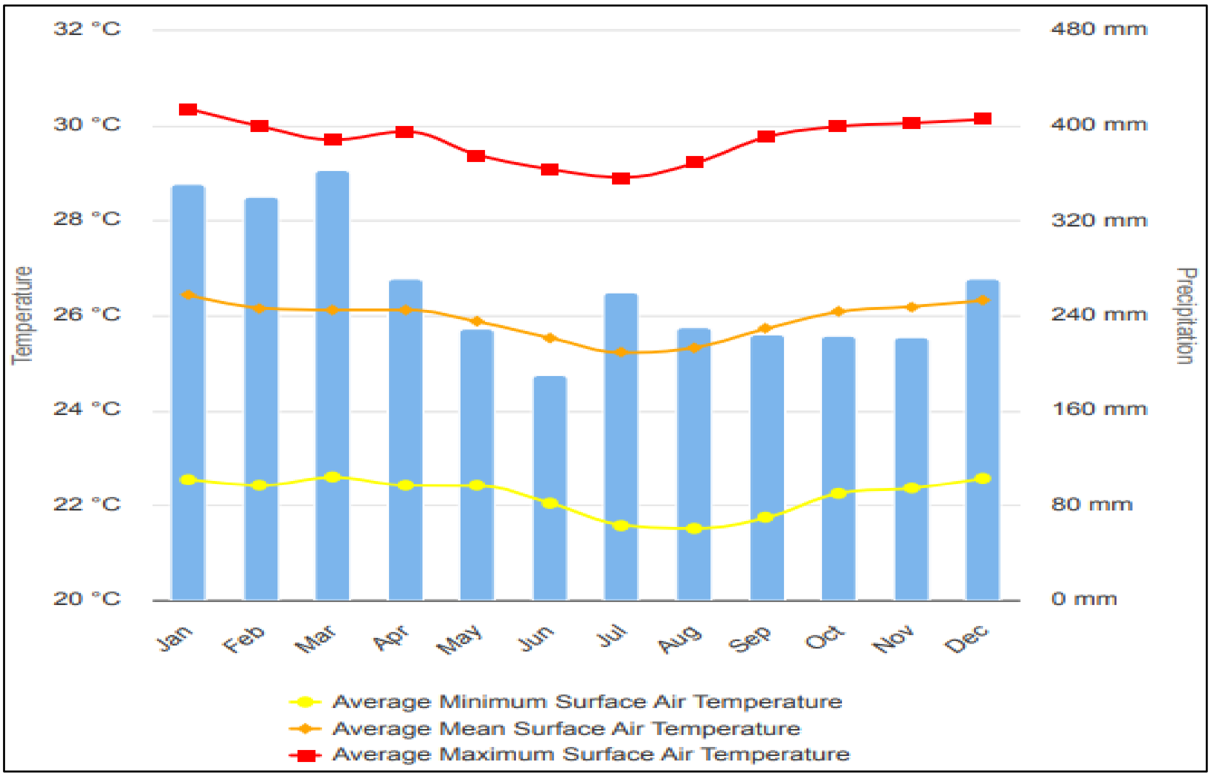


Figure 3: Monthly mean temperatures and precipitation for Solomon Islands for 1991-2022[3]

Cyclones and storms along with torrential rainfall, cause significant flooding, which damages infrastructure, human health, livelihoods and impacts agriculture. The islands are located within the South Pacific cyclone belt, making them vulnerable to these extreme weather events during the November to April cyclone season. In addition to cyclones, heavy rainfall during this season often leads to landslides in mountainous areas and coastal flooding.

1.1.3. Climate Change Impacts

Solomon Islands, like many small island states, is facing increasing vulnerability from climate change and natural disasters. According to a CSIRO SPREP study of 2019 'NextGen' Projections for the Western Tropical Pacific: Current and Future Climate for Solomon Islands 2050 the climate change projections are as the follows:

- Annual temperatures increase 0.8° to 2.1°C.
- Annual rainfall changes of -5 to +10 per cent.
- More heatwaves.
- More intense rainfall events.
- Greater tropical cyclone impacts.
- Sea level rise from 17 to 37 cm

Climate change is intensifying existing climatic patterns in the Solomon Islands, with rising temperatures, increased frequency of extreme weather events, and changing rainfall patterns

[3] WBG, Climate Risk Country Profile: Solomon Islands, 2021

becoming more pronounced. Sea level rise, poses a serious threat to the country's numerous low-lying coastal communities. This exacerbates issues such as water security due to saltwater intrusion into freshwater supplies, and loss of arable land, particularly in atoll islands. Climate change poses serious challenges, threatening to disrupt ecosystems, livelihoods, and the overall habitability of many islands.

1.1.4. Population

The Solomon Islands is an ethnically diverse country comprising predominantly of indigenous peoples. Most of the population are Melanesians (80%), Polynesians and Micronesians account for five percent (5%) and other ethnic groups account for ten percent (10%). The latest National Population and Housing Census was done by the Solomon Islands National Statistics Office (SINSO) in 2019. As of November 2019, the enumerated population of Solomon Islands stood at 720,956. Compared with 558,457 people in the 2009 Census, this represented an increase of about 29% or 162, 499 people. This population increase represented an average annual growth rate of 2.6% (2009-2019) as shown in figure 4 below.

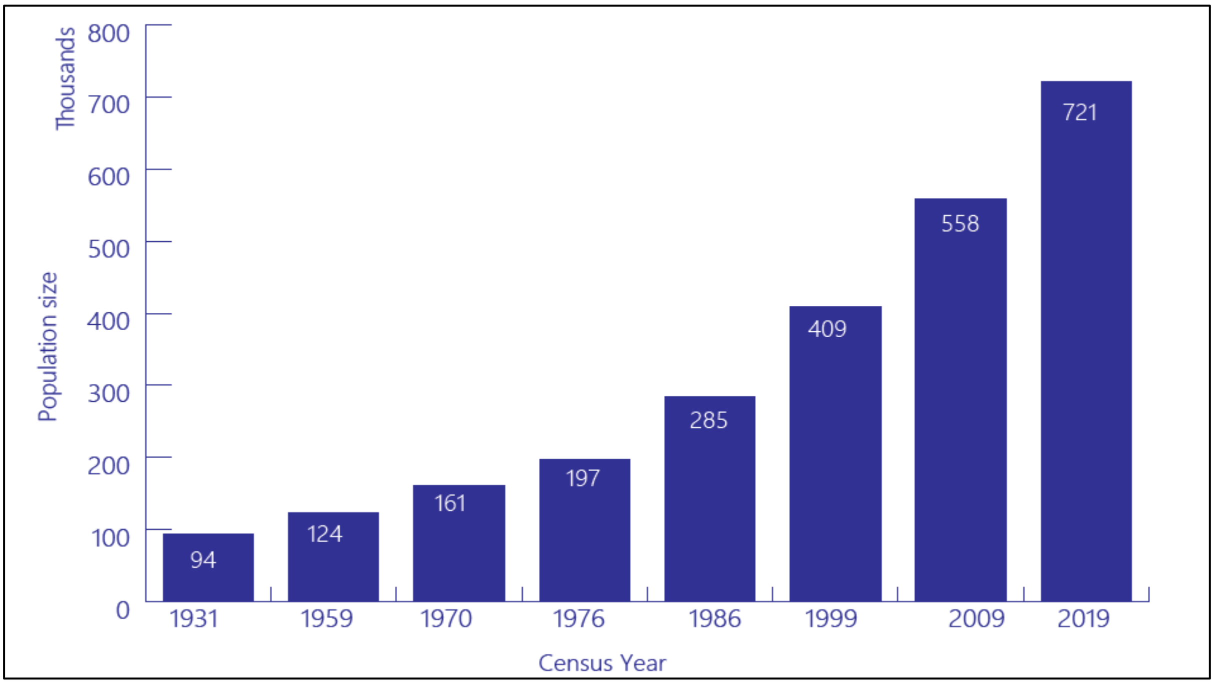


Figure 4: Total population size and trend, Solomon Islands 1931-2019

The total population comprised of 369,396 males (51.2%) and 351,560 females (48.8%). The majority (72.4%) of the population lived in rural areas than in urban areas (27.6%). Between 2000 and 2019, the Human Development Index (HDI) increased by 19.4 percent from 0.475 to 0.567. Although Solomon Islands HDI is 0.567, this is below the average of 0.747 for countries in East Asia and the Pacific. Compared to more than 20 years ago, Solomon Islands HDI has seen improved demographic indicators such as increased life expectancy.

1.1.5. Economy

The economy grew by 2.5% in 2023, after a major collapse in 2020 and 2022, due to the pandemic and the November 2021 civil unrest in Honiara affecting the agricultural and logging sectors: the food and fuel crises by the Ukraine war. The country is slowly recovering, as COVID restrictions were lifted and the Pacific Games 2023 spurred construction and tourism sectors. The country welcomed nearly 26,030 international visitors during the games providing stimulus for the local tourism businesses (ADB, 2024).

Although the country was set to graduate from the Least Developed Country (LDC) category status by 2024, due to the multiple challenges faced by the country in recent years, the UN has agreed to the Government's request for an additional three years to prepare for graduation by 2027(CIP 2023-2024). It has a Human Development Index value for 2021 of 0.564, which puts it in the medium human development category, and ranks 155 out of 189 countries and territories (UNDP, 2020).

The economy of the Solomon Islands is modest, with government promoting economic growth through investments in agriculture, fisheries, forestry, tourism and mining sectors. In 2023 alone, three major export categories were logs and timber 41% minerals 26% and fisheries 17%. (ADB, 2024).

1.1.5.1. Key Economic Sector

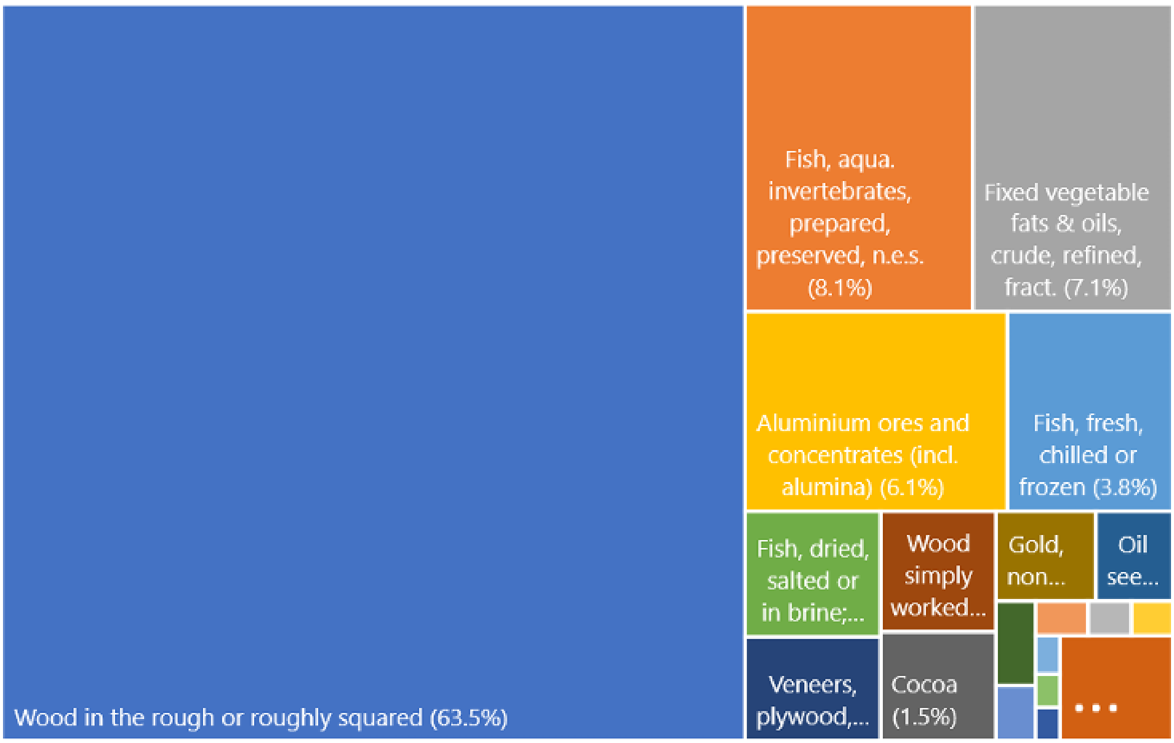


Figure 5: Solomon Islands, shares of exports by product, 2018-2022 total (UNCTAD, 2023)

Based on the UN Trade and Development (UNCTAD) trade matrix data, figure 5 represents share of products over the 2018-2022 period. Logging industry reports the largest export product 63.5

%, followed by fisheries sector (mainly tuna) at 8 %, and agriculture sector accounted for 7% (palm oil, copra (dried coconut), cocoa and coconut oil). Mining sector contributed to a share of 6% over the five-year period (mainly gold, aluminium ores, bauxite and nickel) (UN, DESA, 2024). Subsistence agriculture remains dominant, as nearly 90% of households are involved in some form of agriculture, and 36% of households raise livestock; most of this activity is focused on home consumption. The tourism sector is small but promising, contributing to 4.6% of the national GDP in 2022.

The industry sector is made up of mining, quarrying, manufacturing, utilities (electricity & water), and construction. The industrial sector over the years has seen steady growth. In 2019, the sector contributed approximately 1.4 % to real GDP growth. The latest reports suggest mining as the second largest contributor to the economy at nearly 26%(ADB, 2024). The minerals sector performed well in 2023 as the Gold Ridge Mine had its first full year of operations. Gold production increased to 64,712 ounces compared with 17,565 ounces in 2022.

Much like the other Pacific Island Countries and Territories, Solomon Islands confronts economic challenges. The Solomon Islands' geographic isolation and scattered islands present logistical challenges that limit economic growth. The domestic market is small; and there is limited available skilled labour, it has limited infrastructure; transportation is costly and infrequent; the economy is also heavily dependent on overseas development assistance, while governance short-comings limit state effectiveness. What is also very clear, is that the economy is highly vulnerable to global economic trends and shocks such as the global pandemic, economic recessions, conflicts (e.g., Ukraine war) and onslaught by disasters and climate change. The Emergency Event Database (EM-DAT) and International Monetary Fund (IMF) assessed that Solomon Islands suffered about 2% of GDP loss due to disaster-inflicted damages, in 2019 alone (CFE-DM, 2023).

Although the country has wealth in natural resources, the uneven distribution of resources has impacted the development of different parts of the country differently. The economy with high dependency on natural resources such as forestry, agriculture, and fisheries, is largely vulnerable to climate change. Agriculture is similarly affected by changing rainfall patterns and more intense cyclones, disrupting crop yields and livelihoods. Sea-level rise and coral bleaching threaten coastal fisheries, a key source of food and export income. For example, taro and other staple crops have been severely impacted by saltwater intrusion due to rising tides.The logging industry, a significant contributor to the economy, is also at risk from climate-driven changes in forest ecosystems.

Government initiatives such as Sustainable Logging Policy (2018) and National Forestry Policy (2020) are developed and being implemented to support sustainable management of forest resources. The fisheries sector also faces sustainability challenges due to overfishing and climate change impacts. Vessel maintenance issues and poor weather conditions accounted for 17% drop in the fish catch in 2023 alone. Additionally, climate change threatens these sectors, with an especially negative outlook with potential reductions in the maximum catch potential of over

50%, which will pose a major threat to national food security, national income, and dietary health in poorer communities.

1.1.6. Enabling Environment

As a nation highly vulnerable to the impacts of climate change and natural disasters, this strategic objective has been a top priority for the Government. Solomon Islands ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994, its Kyoto Protocol in 2004 and the Paris Agreement in 2016. Since the ratification of the Convention, successive governments have made various policies and institutional changes to effectively implement the Convention.

Although a small climate change unit was established within the then Meteorological Service Department of the then Ministry of Aviation and Meteorology since 1994 which resulted in the development of the country's first national communication, the biggest institution change that showed the country's serious commitment in implementing the Convention came in 2008 when the government back then established a dedicated climate change division within the Ministry of Environment, Climate Change, Disaster Management and Meteorology.

Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) and has been restructured to be more strategic in addressing all climate change, disaster management issues in the country.

Recent institutional and programme development of relevance to climate change action include the establishment of a climate change finance unit with the Ministry of Finance and Treasury, a REDD+ unit with the Ministry of Forest and Research, climate change programs driven through sectoral ministries like Ministry of Provincial Government and Institutional Strengthening and the establishment of climate change focal points within ministries.

1.1.7. Government Institutional structure

Solomon Islands is an independent state with a Westminster-style government and constitution composed at independence from Britain in July 1978. An executive government is formed from elected members of Parliament, Parliament retains legislative powers, and independent judiciary and civil service administer justice and government operations respectively. Special features of Solomon Islands Constitution include the ability for Parliament to amend the Constitution, codified functions and collective responsibility of cabinet, and codified safeguards for individual rights to speech, worship, movement, and assembly.

The head of state is the King of England and is represented in Solomon Islands by the Governor-General. The Governor-General acts on the advice of the Prime Minister and the cabinet. The Governor-General of Solomon Islands is elected by parliament.

The legislative functions are held by an elected Parliament of 50 members. Parliament is required to pass annual budget bills of appropriation.

The executive functions are held by the Prime Minister and nominated cabinet ministers from Parliament. The Prime Minister, elected by Parliament, chooses the other members of the cabinet. Cabinet members are assigned administrative responsibilities for ministries.

The constitution of Solomon Islands can be amended by the Act of Parliament. The most recent amendment to the Constitution was August 2022, for deferral of elections until after the Pacific Games in November 2023.

In addition to the national capital territory of Honiara, nine provincial governments of Solomon Islands are established by the Provincial Government Act 1997. The provincial governments are: Western, Isabel, Central, Guadalcanal, Malaita, Makira Ulawa, Temotu, Choiseul, Rennell and Bellona. The powers devolved to provincial government include property tax, local business licensing, agricultural land use, housing standards, fire protection, waste management, markets, and keeping of domestic animals. Provincial governments are primarily funded through the Provincial Fund. Provincial governments have powers to constitute Area Councils. The Honiara City Council is established under the Honiara City Act 1999.

The Government of Solomon Islands is implementing the climate change mitigation policy, programme and initiatives with different line ministries, public and private sectors. The key institutions in Solomon Islands for mitigation includes following:

The MECDM is the nodal agency responsible for sustainable environmental management, climate change adaptation and mitigation, disaster risk management and meteorological services for the Solomon Islands. The Ministry is organized into four technical divisions that look after each of the technical areas, namely environment and conservation, climate change, disaster management meteorology.

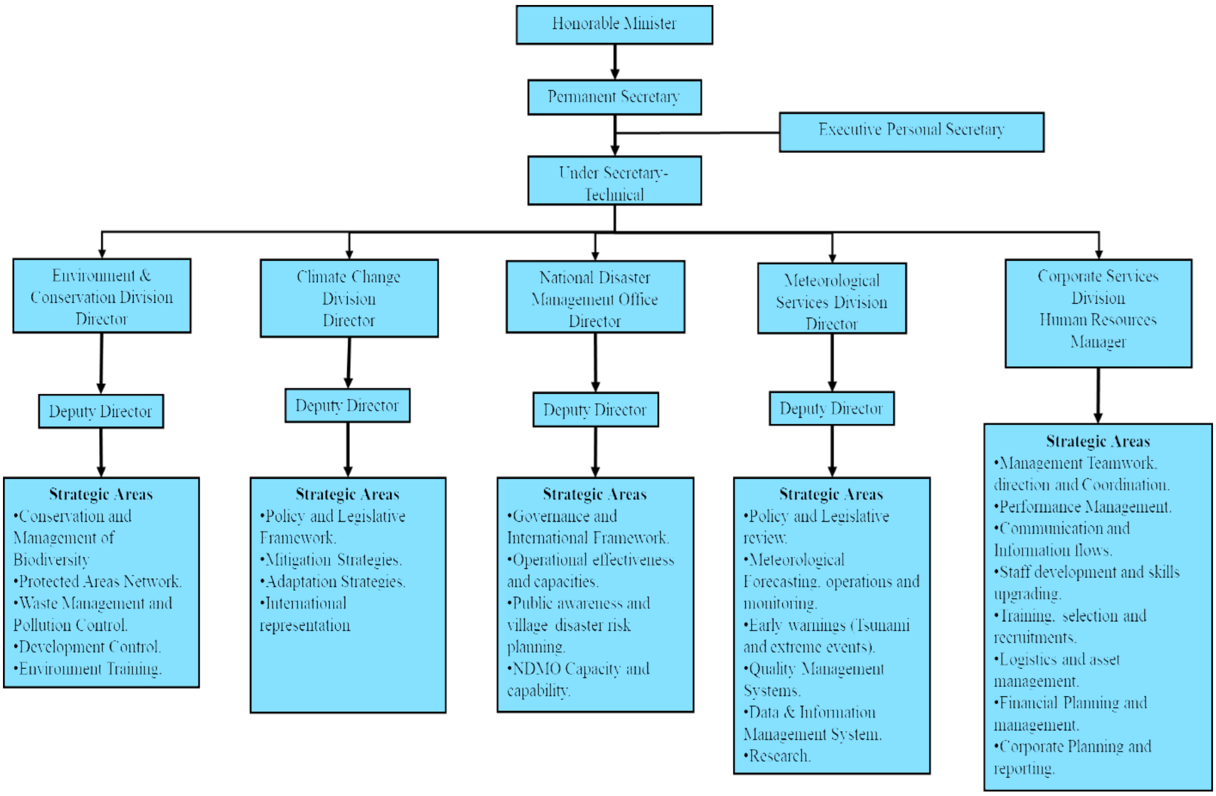


Figure 6: MECDM Institutional Structure

The Ministry of Environment Climate Change and Disaster Management and Meteorology is made up of 4 Divisions and 1 Office. They are the:

- Environment & Conservation Division
- Climate Change Division
- Disaster Management Office
- Meteorological Services Division
- Corporate Services Division

1.1.8. National Climate Change Policies and Strategies

Since the establishment of the climate change division in 2008, the government had developed relevant frameworks, policies, and strategies to guide its work in addressing climate change in the country as well as implementing requirements of the Convention. This includes the the National Adaptation Programme of Actions (NAPA 2008); Intended Nationally Determined Contribution (INDC 2015); Third National Communication Report to UNFCCC (TNC 2024); Nationally Determined Contribution (2021); National Climate Change Policy (NCCP 2023-2032); Relocation Guideline 2022 and other related sectoral policies and strategies.

The National Climate Change Policy 2023-2032 also aligns with national, regional and international policies, strategies and frameworks such as the National Development Strategy (NDS) 2016-2035 which maps out the strategic direction for sustainable development in Solomon Islands and remains the overarching development guideline for the country.

Similarly, NCCP also aligns with the State of the Environment Report (2019), the National Environment Management Strategy (2020-2023), the Solomon Islands National Oceans Policy (2018), the Solomon Islands National Biodiversity Strategy Action Plan (2016), the Solomon Islands Meteorology Policy 2023 Framework for Resilient Development in the Pacific (2015), the Paris Agreement (2015), the United Framework Convention on Climate Change (1992), and the United Nations Convention on Biological Diversity (1992).

1.1.9. Mainstreaming Climate Change

The Solomon Islands Government ensured that climate change is mainstreamed in it highest and longest development plan - its National Development Strategy (NDS 2016-2035). The fourth objective of the NDS focuses on resilience building. Directly linked to the implementation of the fourth objective of the NDS is the National Climate Change Policy (2023-2032). There are various strategies that then link to parts of the climate change policy which are aimed at addressing cross-cutting issues and sectors. This includes the NAPA, the Relocation Guideline, the NDC, the Low Emissions Development Strategy (LEDS) and other sector specific strategies.

A Measurement, Reporting, and Verification (MRV) framework has also been developed to measure the progress in the implementation of these various strategies and policies. Plans are also in place to develop provincial climate change or resilience frameworks.

1.1.10. National, Regional, and International Climate Change Frameworks

National climate change policy (2023-2032) and development of various climate change and disaster risk management frameworks are also aligned with various regional and international climate change and disaster risk management frameworks.

Table 1: Examples of National, Regional and International Climate Change Frameworks Applicable to Solomon Islands

Level	Climate Change	Disaster Risk Management
National	• National Climate Change Policy 2012-2017 • Intended Nationally Determined Contribution (INDC) 2015 • National Development Strategy 2016-2030 • REDD+ Roadmap	• National Disaster Council Act 1989 • National Disaster Management Plan 2018 • Meteorology Act 1985
Regional	• Frame for Resilience Development in the Pacific (FRDP) 2017-2020.	• Pacific Disaster Risk Reduction and Disaster Management Framework of Action (PDDFA)

	• Pacific Islands Framework for Action Climate Change (PIFACC)2006-2015	• Framework for Resilient Development in the Pacific (FRDP) 2017 - 2030
International	• Paris Agreement 2015	• Hyogo Framework for Action 2000-1015 • Sendai Framework for Disaster Risk Reduction 2015-2030

1.1.11. Key Sector profiles

1.1.11.1. Agriculture

Agriculture is the backbone of the Solomon Islands' economy, playing a vital role in both subsistence and commercial activities. Due to limited access to infrastructure and services, the agriculture sector, including crops and livestock, large portion of the population relies on agriculture for their livelihood, with a majority engaged in subsistence farming. Agriculture sector contributes 85% of the country's rural economy. Women play a significant role in household production and selling of produce. It contributes to the local food security as 96% of rural households grow at least some of their own food with crops such as root crops, tubers, and vegetables (WBG, 2021). The country's tropical climate and rich volcanic soils are conducive to a variety of crops, including root vegetables, fruits, and tree crops that thrive in humid conditions.

Major Crops and Exports

Key agricultural products include cocoa, copra (dried coconut meat), and palm oil, which are also the country's major exports. Coconut farming is widespread, and copra is one of the oldest export commodities, contributing significantly to the agricultural economy. Palm oil production has grown considerably in recent years.

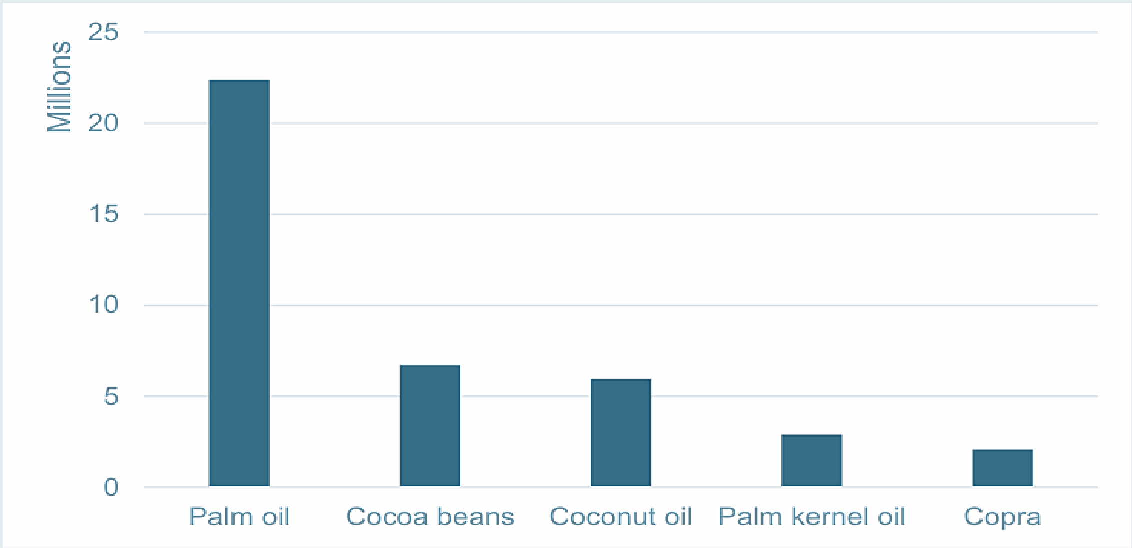


Figure 7: Solomon Islands Top agricultural exports (USD million), 2020 (McNaught, 2023)

Agriculture consists mainly of three sub-sectors:

- Subsistence and smallholder farming: subsistence and smallholder farming is the predominant occupation of the rural population and in many cases the sole source of livelihood for rural communities. Most rural people rely on subsistence agriculture for food both for household consumption and to support living standards through the selling of excess products in local markets. These crops are grown on small plots, using traditional farming methods. Farming systems are primarily shifting cultivation, where land is cultivated for a few years before being left to fallow, allowing the soil to recover. The main crops for subsistence and smallholder farming are sweet potato, cassava, taro, yam, and banana. Crops and livestock are occasionally used for cultural and social obligations.
- Commercial sub-sector farming: The main crops for commercial sub-sector farming are Potato, cassava, kava, noni, ginger, melon, pineapple, and wild nuts. Livestock such as chicken and piggery are also the main source of income for small-holder farmers. The commercial sub-sector has grown during this period (2011-2018). This period has also shown interest in and increase in the processing of agricultural goods from commercial sub-sector farmers. This is obvious with crops such as kava, cassava, cocoa, coffee, and noni. Some of these processed products are then exported to international markets.
- Large plantations: large plantations consist mainly of coconut, oil palm, and cocoa. They remain predominantly the main crops for export. Coconut farming is widespread, and copra is one of the oldest export commodities, contributing significantly to the agricultural economy. Palm oil production has grown considerably in recent years. There is only one large scale commercial palm oil plantation (GPPOL), which is the second largest private employer in the country, with about 1,500 workers in its core operation (McNaught, 2023). Cocoa production is another major agricultural activity. Cocoa beans are grown by smallholder farmers and exported primarily for processing abroad.

However, production fluctuates due to challenges like disease, climate variability, and the lack of advanced farming techniques.

Climate change impacts on agriculture include rapid onset direct impacts such as those from extreme events such as cyclones and floods as well as slower impacts from temperature changes, salt-water intrusion, and changing patterns of pests and disease infestation. Extreme weather events, such as cyclones and flooding, regularly damage crops and farming infrastructure. Underlying challenges facing the sector are long-standing, including the highly dispersed rural population with poor access to infrastructure and services and high vulnerability to natural disasters (e.g., floods in 2014 followed by a severe drought in 2015-16) and unsustainable agriculture practices such as un-controlled deforestation.

The sector is also highly vulnerable to pests and diseases as evidenced by the 2015 incursion of the coconut rhinoceros beetle (CRB) which is resistant to current conventional biological control measures. This presents a major threat to the coconut sector which is an important cash and food crop. Cocoa pod borer (CPB) is a serious threat to the cocoa industry and is already present in other Pacific Island nations such as Bougainville, Papua New Guinea.

As part of addressing the continuous socio-economic challenges of the country, the Ministry of Agriculture and Livestock developed the revised National Agriculture and Livestock Sector Policy 2015-2019. The policy provides a framework to reorient agriculture production to meet developmental needs, alleviate poverty, and provide food security in the country.

Other agriculture policies and strategies developed during this period include the National Food Security, Food Safety and Nutrition Policy 2010-2015; Community-Based Land Use Planning Framework 2015; Solomon Islands Government Policy on Organic Agriculture Systems, and others. Additional commodity-specific policies, strategies, and guidelines include (i) Solomon Islands Coconut Sector Strategy 2010, (ii) Solomon Islands Cocoa Industry Policy and Strategies 2012-2020, (iii) Indigenous Fruit and Nut Industry in Solomon Islands Policies and Strategies 2014, (iv) "Kaikaim Lokol Kaikai" a Framework for Action on Local Food Promotion in Solomon Islands.

The recent investment plan developed by the Ministry of Agriculture and Livestock (MAL) is the Agriculture Sector Growth Strategy and Investment Plan (ASGSIP) 2021-2030. This is an ambitious 10-year roadmap aimed at revitalizing, modernizing, and commercializing the agricultural sector to contribute to the well-being and prosperity of all Solomon Islanders, ensuring food and nutrition security and increased economic growth. The country's vision for the agriculture sector as presented in this strategy is for our nation to have a sustainable, competitive, and profitable agricultural sector that enhances economic growth, food sovereignty, and prosperity for all Solomon Islanders.

The strategy includes a national crop development plan to increase exports and domestic use of:

- copra and other coconut-derived products
- cocoa and its products
- high value crops (kava, coffee, cassava, and other emerging crops).

It is particularly important to increase productivity in the sector to increase earnings in rural areas.

1.1.11.2. Fisheries

Fisheries and marine resources are the second largest source of export income after forestry. The sector is a critical component of the Solomon Islands' economy, playing a central role in both the subsistence livelihoods of the population and in contributing to national revenue. The country's vast Exclusive Economic Zone (EEZ) spans 1.58 million square kilometers of ocean, providing rich fishing grounds that support local communities and generate significant export income (CIA,2014).

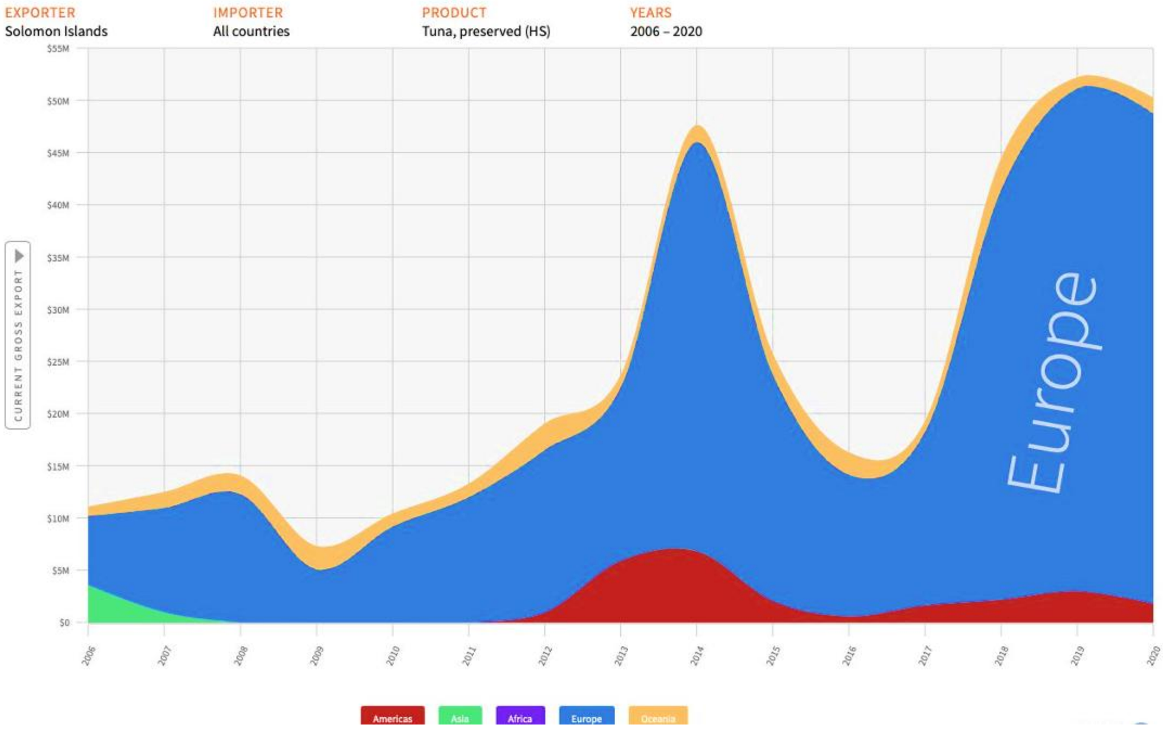


Figure 8: Solomon Island Tuna exports (USD million) (McNaught, 2023)

Tuna products have grown to be the country's second largest export, and a key source of jobs, representing 17% percent of all goods exports in 2023, which is higher than the 11.5% reported in 2020. The tuna processing facility SolTuna, based in Western Province, employs over 1,800 staff, 64 % of whom are women. Work is underway (with support from IFC) to launch the Bina Harbour Tuna Processing Plant in Malaita Province, a potential public-private partnership (PPP) that could lead to 1,600 direct new jobs at the plant (McNaught, 2023).

Fishing license fees are also a major source of government revenues, reaching USD 36.6 million annually. Solomon Islands is a member of the Parties to the Nauru Agreement (PNA), which controls the world's largest sustainable tuna purse seine fishery. The fisheries and marine resources sector are defined in several categories, namely, subsistence, offshore, commercial inshore (coastal) which includes beach-de-mer, aquarium trade, trochus which are active now, inland (freshwater), and aquaculture.

- Subsistence Fishing: Subsistence fisheries are catching fish for cultural ceremonial festivals and for home consumption. Subsistence fishing, which is vital for food security, particularly in rural and coastal communities. These fisheries provide the bulk of the protein intake for local populations. Fishing collections are done typically by traditional and small-scale, relying on simple equipment like handlines, spears, and nets. Reef fish, shellfish, and invertebrates are common catches, supporting daily household consumption. Its sustainability depends on the growing population, natural changes of climate and land developments.
- Offshore: Offshore fishery is based on tuna that is caught through purse-siene, long-line and pole line by fishing vessels categorized and flagged as domestic vessels or foreign vessels. Offshore fishry targeted species are the four main tuna species namely, yellowfin (*Thunnus albacares*), big eye (*Thunnus obesus*), albacore (*Thunnus alalunga*) and skip jack (*Katsuwonus pelamis*) tuna. In 2020, Solomon Islands recorded a total of 194 fishing vessels where 39 were nationally flagged vessels with 155 foreign fishing vessels given access to operate in Solomon Islands waters or EEZ.
- Commercial Inshore: This fishery involves commodities sold within local markets and exports of the country through legitimate consignment process according to state rules and regulations. Coral reef and demersal fish are sold locally, whereas beche-de-mer, trochus and giant clam shells and aquarium fish are traded to international markets.
- Inland (freshwater): Although there is limited knowledge for inland freshwater fisheries, few biodiversity studies and reports highlight the importance of native freshwater fish such as flagtails, gobies, eels, and freshwater shrimps (Gillett, 2016). Mozambique tilapia fish species had become a supplementary source of food, especially in Auki, Malaita, Lees Lake, Guadalcanal, and Lake Tengano on Rennell Islands as it is common in some streams, lakes, and swamps in the Solomon Islands (MFMR, 2010). There is no definite management plan for inland freshwater waters fisheries, in the current government initiatives.
- Aquaculture: Aquaculture proven to be a viable option to support and contribute to food security and livelihoods for Solomon Islands. Aquaculture in the Solomon Islands is still in its infancy, limited to farming of tilapia, pearl oyster, clam farming and seaweed farming. There are export opportunities with aquaculture, including seaweed, which peaked at an export value of USD 1.4 million in 2013. Other high-value export products, such as sea cucumbers, trochus, and pearl oyster shell are currently overexploited, leaving less opportunity for growth (McNaught, 2023).

A new tilapia hatchery in Guadalcanal is set to ease in-shore fishing activities and boost food security for the Aruligo community, 32 km north-west of the Honiara. It is jointly funded by the Solomon Islands and the New Zealand governments under the Mekem Strong Solomon Islands Fisheries programme (MSSIF). The hatchery will improve food security, help reduce pressure on existing in-shore fisheries, and help rural people, particularly youth, participate in the productive sector. The complete Tilapia farm hosts a laboratory, an office, a covered area of tanks for growing juvenile fish, and a perimeter fence.

While fisheries are an essential resource, the sector faces several challenges, primarily related to sustainability. Overfishing, particularly tuna, poses a serious risk to fish stocks. Unsustainable practices have led to concerns about the long-term viability of key fish populations. Climate change also threatens the fisheries sector. Rising ocean temperatures and changes in sea currents can affect fish migration patterns, reduce fish stocks, and increase the frequency of coral bleaching events that harm reef ecosystems crucial to artisanal fishing. Furthermore, natural disasters like cyclones and floods often disrupt fishing activities and damage both infrastructure and marine habitats

The Solomon Islands government, along with regional organizations such as the Pacific Islands Forum Fisheries Agency (FFA), is working to improve the management of tuna stocks through sustainable fishing agreements. In cooperation with regional bodies like the Parties to the Nauru Agreement (PNA) and the Western and Central Pacific Fisheries Commission (WCPFC), aimed at combating illegal, unreported, and unregulated (IUU) fishing, the Solomon Islands has taken steps to enforce stricter regulations on tuna fishing, including limits on fishing days and the use of sustainable practices. The Solomon Islands government has implemented several policies aimed at promoting sustainable fisheries. The National Fisheries Policy outlines strategies for improving resource management, enhancing community involvement, and ensuring that the benefits of fisheries extend to all Solomon Islanders.

1.1.11.3. Tourism

The Solomon Islands' tourism sector is small but holds great potential due to its rich natural and cultural assets. In the longer term, tourism has the potential to be a strong contributor to economic growth. Known for its pristine environment, biodiversity, and historical significance, the country provides substantial opportunities for niche tourism, offers unique attractions for eco-tourism, adventure tourism, and cultural tourism. Despite its potential, the tourism industry in the country remains underdeveloped compared to neighboring Pacific nations like Fiji or Vanuatu.

Tourism contributed about 4.6% to the national GDP in 2022, but this is far lower than in other Pacific Island nations. The sector's development has been hampered by logistical challenges, limited infrastructure, and a global decrease in travel due to the COVID-19 pandemic. However, the Pacific Games held in Honiara in 2023 brought an influx of visitors, providing a boost to tourism recovery.

Due to the remoteness of many islands, connectivity remains a major challenge, with only a few direct international flights operating primarily between Honiara to nearby countries and underdeveloped internal transportation networks make travel between islands difficult, further hindering tourism growth. Improvements in domestic air and sea transport, along with investment in tourism-related infrastructure such as roads, airports, and telecommunications, are necessary for the growth of this sector.

1.1.11.4. Forestry

In 2023, around 41% of the country's export earnings came from forestry, mainly through the sale of logs and Timber. The forestry sector in the Solomon Islands has historically been a major economic driver, primarily through logging. The economic dependency on log exports has already spanned over the last two decades as a result of no significant investments in other sectors, and a nearly unfettered logging industry. The country's rich tropical rainforests are valuable for timber production, and the sector has contributed significantly to national revenue through timber exports. Timber is exported mainly to Asian markets. However, unsustainable logging practices have led to extensive deforestation and environmental degradation, sparking concerns about the long-term viability of the sector. At the current harvesting rate, timber resources are expected to last only 1-2 more decades before exhaustion (RAMSI, 2012).

The future of the forestry sector is in sustainable plantations and forest conservation. Government of Solomon Islands developed a sustainable logging policy in 2018 that recognizes that production must come down significantly. In this scenario, sustainable timber plantations, such as Kolombangara Forest Plantations Limited (KFPL), are better suited for future development. KFPL is certified by the Forest Stewardship Council and operates a 40,000-hectare project site, of which 26,000 hectares is protected natural forest(McNaught, 2023).

There is also a growing sector for value-added timber products. Sawed wood exports reached nearly USD 11 million in 2018, with the main export destinations of New Zealand and Australia.

Unsustainable harvesting practices and weak regulatory enforcement have led to severe deforestation, with forests being logged at unsustainable rates. This has resulted in loss of biodiversity, soil degradation, and increased vulnerability to natural disasters such as floods and landslides. The Solomon Islands Timber Processors and Exporters Association (SITPEA) in collaboration with the Pacific Horticultural and Agricultural Market Access (PHAMA) helping its members comply with international timber legality programs. The government aims to closely monitor the logging sector to ensure logging remains within sustainable limits, stricter logging regulations are enforced, and illegal logging is stopped.

1.1.11.5. Mining

Solomon Islands has significant mineral resources including gold, nickel, and bauxite, the sector is relatively underdeveloped but holds significant potential for growth. However, past developments in the sector have been rife with environmental, social, and governance problems. The World Bank has done a detailed overview of the mining sector and its challenges in its latest Solomon Islands Public Expenditure Review.

Key Mineral Resources

- Gold: Gold production in 2023 increased to 64,712 ounces as compared to 17,565 in 2022. Gold Ridge Mine, located on Guadalcanal, has been the primary gold mining operation in the Solomon Islands. After a period of suspension, it reopened with new investment.

In 2023, Gold Ridge Mine had its first full year of operations since 2014. Gold production is expected to substantially contribute to national revenue. Although a most prominent contributor of gold mining operation, the Gold Ridge Mine has experienced periods of closure due to environmental and social challenges in the past, such as in 2014, after being hit with a flash flood.

- Nickel: The islands also possess substantial nickel deposits, and several international mining companies are exploring these resources for commercial extraction. According to the World Bank report, with a proper legislative framework in place, gold and nickel mining projects could generate 3.3 percent of GDP in additional tax revenue (WBG, 2022).
- Bauxite: Bauxite was discovered on Wagina Islands in 1967. Solomon Bauxite Limited obtained a Mining Lease over the Wagina Bauxite deposit in 2017, however the development consent under the Environment Act was cancelled by the Minister of Environment in 2020. Rennell Island bauxite deposits were discovered by Mitsui in the 1970s. Bauxite exports from Rennell Island began in 2014 by APID/BMSI and peaked in 2018 at USD 60 million (8 % of goods exports). In February 2019, a bulk carrier attempting to load bauxite ran aground and spilled 300 tonnes of oil into the Kangava bay off Rennell island. Five months later, another accident resulted in an estimated 5,000 tonnes of bauxite spilling from a barge into the bay. Both incidents highlight the environmental risks of mining and the impact on local communities. There are other known bauxite pockets throughout the country and are currently evaluated by some companies. Mining Lease was cancelled on the 3rd of June 2021 due to breaches in compliance with agreements.

Several mining projects are underway, which could potentially offset the decline in logging exports. The Gold Ridge mine, under new ownership, resumed limited production in late 2022. Similarly, Pacific Nickel received a mining lease in September 2022 for the Kolosori nickel project on Isabel Island and is expecting to produce 1.3 million wet metric tons of direct shipping nickel ore per year, starting in 2023. Over exploitation and unsustainable mining practices have raised concerns regarding their impact on the environment and local communities. Pollution, land degradation, and conflicts over land rights are ongoing issues that have hindered sector development. Sustainable mining practices, along with stringent environmental regulations, are crucial for the grow of this sector without causing irreversible environmental damage.

1.1.11.6. Energy

The energy sector in the Solomon Islands is underdeveloped, with the country heavily reliant on imported fossil fuels, especially for electricity generation. However, efforts are being made to transition to more renewable energy sources, including hydropower, solar, and geothermal. The Ministry of Mines, Energy, and Rural Electrification (MMERE) manages policy for both the electric power and water and sanitation systems. Operating under the Electricity Act, the government owned utility company, Solomon Islands Electricity Authority (SIEA) or Solomon Power, generates and supplies grid-connected electricity. It provides electricity to Honiara and eight key settlements (Auki, Buala, Gizo, Kirakira, Lata, Malu'u, Noro-Munda, and Tulagi).

Access to electricity access: Grid-connected electricity is supplied to less than one-fifth of the population. While the access rate in Honiara is 64%, access in the remainder of the country is 6%, and five of nine provinces have access rates below 4%(CFE-DM, 2023). The main reasons for the low access rates are the high cost of diesel power generation in the provincial centres, absence of adequate community service obligation funding; the lack of a government community service obligation funding for grid extensions; the difficult geography and dispersed small population; and the low capacity to pay in some areas. Kerosene lamps are the main source of lighting for 79% of households, while 12.2% use solar systems. Other sources of lighting for households include wood fire, mini-hydropower, portable generator, and gas. For cooking, 98.3% of households use wood with the remainder relying on gas, kerosene, and other forms.

Installed capacity: Development and provision of economic infrastructure is concentrated in Honiara; 89% of the national power generation capacity is in Honiara. Installed Capacity in Honiara is 30 megawatts (MW) with a peak load of 1.6 MW; combined installed generation capacity in the provincial is 5 MW. Most grid-connected power generation in Solomon Islands is diesel, but government is committed to increasing investment in renewable energy. In 2019, the total net electricity generation was 93.285GWh, of which 82.0% was sold, and 18.0% were total technical and non-technical losses. Electricity tariff in Solomon Islands is among the highest in the Pacific Islands as well as globally. The Lungga power station (diesel) in Honiara is the main power station with a generation capacity of 27MW; it was joined in 2016 by the Henderson Solar Plant (1MW). Meanwhile, since 2016, upgrades have been completed to the diesel generators in Gizo (1.5 MW), Noro (1.5 MW), Munda (250 kilowatts; kW), Auki (1MW), and Tulagi (500 kW). In May 2016, the refurbished Buala Mini Hydro plan was completed, returning 150 kW of clean energy to the grid, and in July 2017, two mini-hybrid stations (solar panels, battery storage, and back-up diesel) were brought on-grid in Western and Choiseul Provinces to serve 400 new customers.

Renewable energy projects: As part of the Government's commitment to achieving its Nationally Determined Contributions under the Paris Agreement, the government has proposed multiple renewable energy projects. While the country is endowed with some renewable energy resources, e.g., geothermal, hydro, solar, ocean, and biomass, most of these (except for solar and hydro) have not yet been tapped.

- Hydropower: Tina River Hydropower Project (20 MW) for the Honiara grid, Fiu River Hydropower Project (750 kW) for the Auki grid, three new small solar–diesel hybrid grids, and refurbishment of Buala hydropower plant (185 kW).
- Solar Energy: A growing number of households have small solar home systems. Solomon Power has plans to develop 16 additional solar hybrid mini grids by 2027, with co-financing support from several donors.
- Geothermal Energy: Geothermal resources are being explored, particularly in volcanic regions

Government reforms: Government launched the Solomon Islands Renewable Energy Roadmap in July 2022, which aims to reach 100 % renewable energy by 2030; if fully implemented, this would create an independent regulatory body for the energy sector and opens the sector to independent power producers. Solomon Islands has a national energy policy 2019-2030, Long-Term Low Emissions Development Strategy (LEDS) and recently developed a Renewable Energy Roadmap 2021-2030 for the Honiara grid. Furthermore, MMERE is currently developing a national electrification strategy and investment plan.

1.1.11.7. Water

The water sector in the Solomon Islands is crucial for public health and livelihoods but faces significant challenges, particularly in rural and coastal areas where access to clean drinking water and sanitation facilities is limited. Most of the population relies on rainwater harvesting, surface water, and wells.

Access to Water

In 2020, the government reported that 67% of the entire population had access to basic water services, but there was a significant divide between urban (91%) and rural (59%) access. Moreover, as of 2020, open defecation predominant across the country; access to basic sanitation is 78% in urban areas and 21% in rural areas (CFE-DM, 2023). Lack of access to clean drinking water and improved sanitation services, contributes to the spread of waterborne diseases.

The main source of drinking water in Solomon Islands comes from surface water in the form of streams, springs, or rivers. Most small atoll islands collect rainwater for drinking and utilize brackish water from shallow hand dug wells for most of their other domestic needs. Some communities on the higher volcanic islands also use groundwater for domestic purposes. The major users of groundwater resource are Honiara city and Guadalcanal Plains. The Guadalcanal Plains on the northeast coast of Guadalcanal have abundant potential for groundwater. However, with increasing agricultural developments in the area there is an urgent need for proper planning and management of the resource.

Under the supervision of the Ministry of Mines, Energy, and Rural Electrification (MMERE), the state-owned enterprise Solomon Islands Water Authority (SIWA) or Solomon Waters is mandated to develop and manage urban water supply and sewerage services. Solomon Water provides consolidated water and sanitation services in Honiara, Auki, Noro, and Tulagi. Supply is divided into nine zones with limited cross connection between systems and small diameter reticulation pipes. These elements contribute to frequent water outages and poor supply pressure across much of the network. Moreover, most water supply sources only have chlorination facilities for basic treatment; water quality is frequently compromised due to these failures. Some 50% of water produced is not billed due to a combination of leaks, illegal connections.

In some villages on the islands of Malaita, Vella la Vella, Makira and Choiseul communities are having to cope with situations where some rivers are frequently dirty while others flow rate have been reduced considerably. Climate change is exacerbating water security issues. Rising sea levels are causing saltwater intrusion into freshwater sources, particularly in low-lying atoll islands. More frequent and intense storms and changing rainfall patterns are also affecting the availability of clean water.

Provincial governments have begun to consider establishing ordinances to protect water resources with support from the national government. MMERE under its water resources division is responsible for national water resource assessment, management, and the development of groundwater while Ministry of Health and Medical Services (MHMS) through its Environment Health Division oversees the quality of water and provision of safe water and sanitation for the country's rural population through the Rural Water Supply and Sanitation Programme (RWSSP)

An integrated national water and sanitation policy was developed but lacks legislation and strong collaboration between the Ministry of Agriculture and Livestock (MAL), MFMR, and MECDM to effectively manage the country's water resources considering agriculture, aquaculture, and industrial needs and effects of climate change.

Recognizing the problem, the government has adopted the following policies and legislation:

- River Waters Act (Cap.135) rev. Edition 1996 – watershed control in relation to river waters and use of designated river water through permit applications. It does not cover ground water.
- Environment Act 1998: makes provision for protection, preservation, and conservation of the environment, prescribes an EIA process for development purposes.
- Public Health Ordinance 1969: provides for inspections to be conducted for the regulation of water pollution.
- SIWA Act 1992: Overseeing the management and development of urban water resource services and sewerage services.
- Water and Sanitation (WatSan) Policy 2017: provide for coordinated action the supply of safe, adequate, financially, technically, and environmentally sustainable water supply and sanitation service to rural and urban communities.

1.1.12. References:

Maps of Solomon Islands, World Atlas. (2023). https://www.worldatlas.com/maps/solomon-islands

UNDRR. (2023). Disaster Risk Reduction in the Solomon Islands: Status Report. United Nations Office for Disaster Risk Reduction.
https://www.undrr.org/media/86899/download?startDownload=20250416

Climate Risk Country Profile: Solomon Islands. WBG.(2021)

NSO. (2019) National Population and Housing Census National Report https://solomons.gov.sb/wp-content/uploads/2023/09/Solomon-Islands-2019-Population-and-Housing-Census_National-Report-Vol-1.pdf

CIP 2023-2024. Solomon Island Country Implementation Plan 2023-2024. https://pacific.un.org/en/254270-solomon-islands-country-implementation-plan-2023-2024

Human Development Report 2020: The Next Frontier: Human Development and the Anthropocene UNDP. (2020). https://hdr.undp.org/system/files/documents/hdr2020.pdf

Economic trends and prospects in developing Asia: The Pacific Solomon Islands, ADB. (2024) https://www.adb.org/sites/default/files/publication/957856/sol-ado-april-2024.pdf

Solomon Islands Disaster Management Reference Handbook. CFE-DM. (2023). (CFE-DM, Center for Excellence in Disaster Management and Humanitarian Assistance). https://reliefweb.int/report/solomon-islands/solomon-islands-disaster-management-reference-handbook-october-2023

McNaught, T. (2023). Solomon Islands: Navigating a New Path for Sustained Economic Growth. Retrieved from INTERNATIONAL GROWTH CENTRE: https://www.theigc.org/sites/default/files/2024-09/McNaught%20Final%20Report%20September%202024.pdf

World Bank. (2022). Project Information Document- Solomon Islands Recovery and Resilience Project (P177544). https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099045011022232825/p177544053286b0930bdde0fe43cbebcb28

II. National Greenhouse Gas Inventory

Chapter 1: National circumstances, institutional arrangements and cross-cutting information

1.1. Background information on GHG inventories and climate change (e.g. as it pertains to the national context, to provide information to the general public)

1.1.1. Inventory reporting

Solomon Islands is a party to both the United Nations Framework Convention on Climate Change and the Paris Agreement (PA) is committed to develop, publish, and regularly update national greenhouse gas inventories.

This inventory report and associated Common Reporting Tables (CRTs) have been prepared in accordance with chapter II of the annex to the decision 18/CMA.1 Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement[4] (known as the MPG) and decision 5/CMA.3 Guidance for operationalizing the modalities, procedures and guidelines for the enhanced transparency framework referred to in Article 13 of the Paris Agreement[5]. The report provides estimates of Solomon Islands net greenhouse gas emissions for the reporting year 2022 and the time series 1994-2022.

Consistent with the MPG and decision 5/CMA.3, emissions estimates provided in this report have been compiled in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006 Guidelines).

Further, in accordance with paragraph 17 of the MPG, the inventory definitions of the GHG inventory principles used in the GHG Inventory chapter aligns with the 2006 IPCC Guidelines, including the following elements:

Transparency: Information necessary to reproduce the emissions estimates is provided in the inventory report. The report includes a description of Methodologies applied; Activity Data (AD) and Emission factors (EFs) applied for the timeseries used, emissions on a gas-by-gas basis and in units of mass. The GHG emissions are reported using Common reporting tables for the electronic reporting of the information in the national inventory reports (NIRs) of anthropogenic emissions by sources and removals by sinks of GHG as contained in annex I to decision 5/CMA.3.

[4] FCCC/PA/CMA/2021/10/Add.2, chapter II, https://unfccc.int/sites/default/files/resource/CMA2021_L10a2E.pdf
[5] FCCC/PA/CMA/2021/10/Add.2, https://unfccc.int/sites/default/files/resource/CMA2021_L10a2E.pdf

Accuracy: Solomon Islands has ensured the emissions are neither overestimated nor underestimated as far as can be judged. Uncertainty estimates and descriptions of the causes of uncertainty are provided for AD and EFs.

Comparability: Solomon Islands applies methods from the 2006 IPCC Guidelines considering the flexibility provisions in decision 18/CMA.1 and its annex.

Completeness: All categories applicable to Solomon Islands and for which methods are provided in the 2006 IPCC Guidelines are included in the national GHG inventory as appropriate. Emissions estimates cover the entire geographic area of Solomon Islands. Emissions values or notation keys are provided for each category in the relevant reporting table. If, despite the best efforts, emissions for a category for which methods are provided in the 2006 IPCC Guidelines cannot be provided, the relevant flexibility provision applied is clearly referenced.

Consistency: Solomon Islands has applied the same method across the time series (1994-2022) for a given category and can explain the trends observed in the time series.

1.1.2. Gases

In this report, a detailed description of the anthropogenic Greenhouse Gases (GHG) inventory of the emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) and hydrofluorocarbons (HFCs) (It is to be noted that Solomon Islands has negligible or no emission of perfluorocarbons (PFCs), and Sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3) hence not applicable), by sources and their removal by sinks has been presented for the reporting year 2022 and time series 1994-2022. As UNFCCC Reporting Guidelines also encourage Parties to provide information on the following indirect GHGs: Oxides of Nitrogen (NOx), Carbon Monoxide (CO) and Sulphur dioxide (SO_2), and Non-Methane Volatile Organic Compounds (NMVOC), emissions from these indirect gases from the Energy sector in this inventory.

This Report presents emissions for each of the major greenhouse gases as carbon dioxide equivalents (CO_2 eq) using the 100-year global warming potentials (GWPs) contained in the 2014 IPCC Fifth Assessment Report (IPCC 2014)[6].

1.1.3. Sectors

The sectors covered include in Solomon Islands Inventory includes:

1. Energy
2. Industrial Processes and Product Use (IPPU)
3. Agriculture
4. Forestry and Land Use (AFOLU), and

[6] GWPs used are, 1 for CO_2, 28 for CH_4, 265 for N_2O, the full list of GWPs can be found in Table 8.A.1 of Chapter 8: Anthropogenic and Natural Radiative Forcing of the 2014 IPCC Fifth Assessment Report (AR5). GWPs are not available for the indirect greenhouse gases and in accordance with the Paris Agreement reporting guidelines, are reported but are not included in the inventory total.

5. Waste

The reference approach has also been used to estimate equivalent CO_2 emissions from the energy sector for the time series 1994-2022. GHG emissions from international bunker (international Aviation and international water-borne navigation have also been estimated and reported as memo items in the inventory; however, they have not been included in the Solomon Islands total national GHG emissions. Solomon Islands has consistently used the Tier-1 methodological approach and IPCC default emission factors for GHG estimation in its previous inventory submissions, including the First, Second, and Third National Communications, as well as the First Biennial Update Report. This inventory, covering the years 2021 & 2022, follows the same approach.

1. 1.4. Structure of the National Inventory Report

The structure of this Report has been organized to conform to the requirements of Annex V to decision 5/CMA.3 on the outline of the national inventory document, pursuant to the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement.

This report provides background information on the national system and the inventory preparation process. It also presents estimates of Solomon Islands total net emissions, analyses emission trends across sectors and key greenhouse gases, describes the methodologies used, Activity data and Emission Factors used, outlines the quality assurance/quality control (QA/QC) measures applied, and includes the results of the key category analysis and Approach I uncertainty quantification.

1.2. A description of national circumstances and institutional arrangements

1.2.1 National entity or national focal point

The first biennial update report and third national communication of the Solomon Islands is being implemented by the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), in collaboration with United Nations Environment Programme (UNEP) and with support from Global Environment Facility (GEF). MECDM is the National entity responsible for Solomon Islands inventory arrangements. The National Inventory Focal Point is:

Mr. Henry Tufah, Deputy Director
Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM),
P.O. Box 21, Honiara, Solomon Islands,
Telephone- (677) 24074/26004
Email: htufah@mecdm.gov.sb

1.2.2. Inventory preparation process

The Key steps towards the preparation of national GHG inventory of Solomon Island submitted under the previous national communications (SNC, TNC and FBUR) and the First Biennial

Transparency Report for the 2021 & 2022 (as part of Solomon Islands First Biennial Transparency Report to the UNFCCC) is as follows:

- Project Organization Structuring
- Thematic Working Group (TWGs) formation
- Stakeholder Consultation Process
- Training and Capacity Building Programme
- Data collection, Identification of data gaps and uncertainty assessment
- Documents/data review for quality assurance
- Preparation of GHG Inventory Report and Key Criteria Analysis (KCA)
- Review and approval of the GHG Inventory Report

Project Organization Structuring

In Solomon Island, MECDM is responsible for supervising the national inventory process and reporting the emissions to the UNFCCC. The Project Steering Committee (PSC) was formed with main functions to guide TNC project implementation. The PSC works closely with the project Implementation team to ensure the project progress and backstop. Project Coordinator and Administrative Assistant formed the project implementation team.

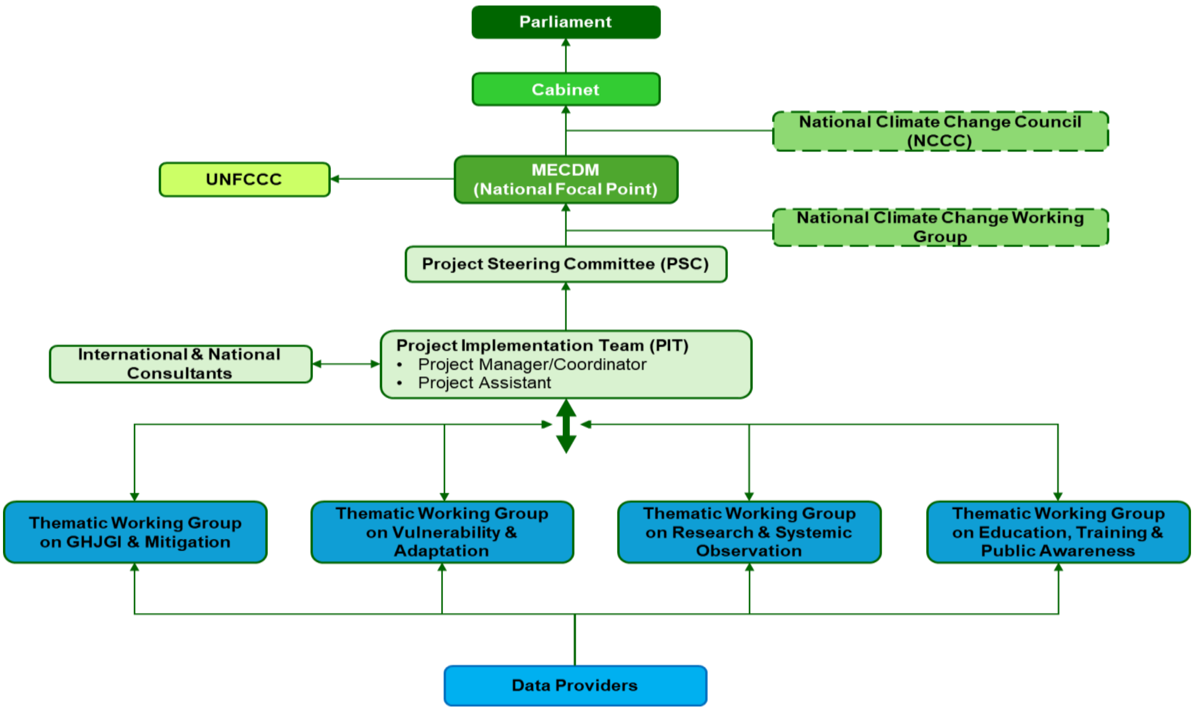


Figure 1.1: Institutional arrangements for Greenhouse Gas Inventory

Training and Capacity Building

The Training and Capacity Building programme was designed and delivered to TWGs and the key stakeholders. A technical training and hand-holding workshop on development of GHG inventories was organized for the TWGs and other relevant key stakeholders. The overall objective was to empower the stakeholders to achieve the necessary level of expertise on development of national GHG inventory through data collection, analysis, monitoring and reporting procedures as per IPCC guidelines and UNFCCC reporting requirements. The stakeholders were also updated on IPCC 2006 Guidelines and Best Practices to develop the national GHG Inventory.

Stakeholder Consultation

The focused stakeholder consultation was carried out with the government and government departments, public and private sectors, local and international development partners, NGOs and public groups. The stakeholder consultation also involved presentation of the results i.e. National GHG Inventory of Solomon Islands for the year 2021-2022, data, standards and assumptions applied for Solomon Islands National GHG inventory, data gaps and uncertainties etc.

The objective of the stakeholder consultation was also to validate the assumptions and standards used for GHG inventory and seek inputs from wide stakeholders. An important aspect of the stakeholder consultation was to update on the data gaps, uncertainties etc. and issues and activities to be considered to improve the quality, completeness and transparency of GHG inventory and updates on inventory improvement plan.

1.2.3. Archiving of information

The data and results from the GHG inventories submitted under the INC (1994), SNC (2000), TNC (2011-2018), and FBUR (2019-2020), as well as the current inventory covering the period 2021–2022, are preserved in both written and electronic formats. The Climate Change Department (CCD) under MECDM maintains the archives of all related data and documents.

1.2.4. Processes for official consideration and approval of inventory

The NIR reports are subjected to formal approval from the MECDM and endorsement by the Cabinet. Prior to the final approval, the NIR undergoes various review stages internally through stakeholder consultations. The report is submitted together with a cabinet paper to the cabinet for deliberation. The cabinet approves with a cabinet conclusion that entails specific editions to be made before submitting. The UNFCCC National focal point is responsible for submitting the report to the Secretariat.

1.2.5. Brief general description of methodologies (including tiers used) and data sources used

1.2.5.1 Estimation methods

The IPCC inventory methodology is divided into various levels of tiers, with generally higher tiers being more detailed and more accurate while the tier 1 level represents the minimum, or default methodology. The national GHG inventory of Solomon Islands for the year 2021 & 2022 is estimated using the tier 1 methodology and using default emission factors provided by the 2006 IPCC Guidelines for the direct GHGs emissions. A consistent approach has been applied throughout the entire time series (1994-2022) and there are no recalculations due to methodological changes and refinements.

Furthermore, to ensure completeness, the national GHG inventory of Solomon Islands uses notation keys where numerical data are not available. These notation keys include:

- "NO" (not occurring): Used for categories or processes, including recovery, under a particular source or sink category that do not occur within a Party.
- "NE" (not estimated): Used for activity data and/or emissions by sources and removals by sinks of GHGs that have not been estimated but for which a corresponding activity may occur within a Party.
- "NA" (not applicable): Used for activities under a given source/sink category that do occur within the Party but do not result in emissions or removals of a specific gas.
- "IE" (included elsewhere): Used for emissions by sources and removals by sinks of GHGs estimated but included elsewhere in the inventory instead of under the expected source/sink category.
- "C" (confidential): Used for emissions by sources and removals by sinks of GHGs where the reporting would involve the disclosure of confidential information.

For categories reported as NE, these are for activity data and emissions that have not been estimated. As part of the improvement plans, continuous efforts are made particularly to identify activity data and emission factors that are used for estimation of emissions for categories that are NE. Table 1.2 provides an overview of the used IPCC inventory methodology and corresponding EF of Solomon Islands national GHG inventory in the inventory year 2021 & 2022.

Table 1.2. Methodological tiers used the national GHG inventory of Solomon Islands in the inventory year 2021-2022

GREENHOUSE GAS SOURCE AND SINK	CO_2		CH_4		N_2O		HFCs		PFCs		Unspecified mix of HFCs and PFCs		SF_6		NF_3	
CATEGORIES	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor
1. Energy	T1	D	T1	D	T1	D										
1.A. Fuel combustion	T1	D	T1	D	T1	D										
1.A.1. Energy industries	T1	D	T1	D	T1	D										
1.A.2. Manufacturing industries and construction	NO	NO	NO	NO	NO	NO										
1.A.3. Transport	T1	D	T1	D	T1	D										
1.A.4. Other sectors	T1	D	T1	D	T1	D										
1.A.5. Other	NO	NO	NO	NO	NO	NO										
1.B. Fugitive emissions from fuels	NO	NO	NO	NO	NO	NO										
1.B.1. Solid fuels	NO	NO	NO	NO	NO	NO										
1.B.2. Oil and natural gas and other emissions from energy production	NO	NO	NO	NO	NO	NO										
1.C. CO2 transport and storage	NO	NO														
2. Industrial processes	NO	NO	NO	NO	NO	NO	T1	D	NE, NO	NE, NO	NE, NO	NE, NO	NO	NO	NO	NO
2.A. Mineral industry	NO	NO	NO	NO	NO	NO										
2.B. Chemical industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2.C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2.D. Non-energy products from fuels and solvent use	T1	D	NO	NO	NO	NO										
2.E. Electronic Industry					NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2.F. Product uses as ODS substitutes							T2	D	NE	NE	NE	NE	NO	NO	NO	NO
2.G. Other product manufacture and use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2.H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

3. Agriculture	NO	NO	T1	D	T1	D										
3.A. Enteric fermentation			T1	D												
3.B. Manure management			T1	D	T1	D										
3.C. Rice cultivation			NO	NO												
3.D. Agricultural soils			NA	NA	T1	D										
3.E. Prescribed burning of savannahs			NO	NO	NO	NO										
3.F. Field burning of agricultural residues			NO	NO	NO	NO										
3.G. Liming	NO	NO														
3.H. Urea application	T1	D														
3.I. Other carbon-containing fertilizers	NO	NO														
3.J. Other	NO	NO	NO	NO	NO	NO										
4. Land use, land-use change and forestry	T1	D	NE	NE	NE	NE										
4.A. Forest land	T1	D	NE	NE	NE	NE										
4.B. Cropland	NE	NE	NE	NE	NE	NE										
4.C. Grassland	NE	NE	NE	NE	NE	NE										
4.D. Wetlands	NE	NE	NE	NE	NE	NE										
4.E. Settlements	NE	NE	NE	NE	NE	NE										
4.F. Other land	NE	NE	NE	NE	NE	NE										
4.G. Harvested wood products	NE	NE														
4.H. Other	NA	NA	NA	NA	NA	NA										
5. Waste	T1	D	T1	D	T1	D										
5.A. Solid waste disposal			T1	D												
5.B. Biological treatment of solid waste			NE	NE	NE	NE										
5.C. Incineration and open burning of waste	NE	NE	NE	NE	NE	NE										
5.D. Waste water treatment and discharge			T1	D	T1	D										
5.E. Other	NO	NO	NO	NO	NO	NO										
6. Other (as specified in summary 1)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Abbreviations: T1 - Tier 1 method; D - Default; NA - Not Applicable; NE - Not Estimated; NO - Not Occurring

1.2.5.2 Data sources

The GHG inventory data for the years 2021 & 2022 for different sectors and sub-sectors were collected using the two approaches i.e. first the "top down" or reference approach and second the "bottom up" or sectoral approach. The data for each sector and sub-sector were compiled from various sources primarily using available national data, data collected and published by the Solomon Islands National Statistics Office (SINSO), Census (Population and Agriculture), Solomon Islands Customs Department, Solomon Power, Public and Private sector (like South Pacific Oil, Markworth Oil Ltd, etc.), and other statistical reports, studies, brochures and other country specific information sources.

In case where actual data was not available, expert judgment was relied upon, particularly for the Agriculture and Waste Sector. For example, the factors like annual per capita protein consumption, manure management systems, etc. were determined based on the judgement of sectoral experts. Furthermore, since human and livestock censuses, as well as the national forest inventory, are not conducted annually, splicing techniques such as interpolation and extrapolation were used to generate data for the entire time series.

The challenges and barriers faced during the data collection and methodologies adopted for data collections are discussed in detail in the following section of the report and under sectoral and sub-sectoral analysis. Several country specific and regional assumptions were used to represent the local conditions of the country, as highlighted in the subsequent sections (highlighted in the following section of this report). These assumptions have been verified with the local sector experts and cross-checked with other resources for correctness and accuracy. Wherein formal data is unavailable, emissions for the affected sectors and sub-sectors have not been estimated in this inventory and reported. Justifications for data choices and their limitations are provided in the following sections and within the sectoral and sub-sectoral analyses.

1.2.5.3. Brief description of key categories

A key source category has a significant influence on a country's total inventory of direct greenhouse gases in terms of absolute level of emissions, the trend in emissions, or both. Solomon Islands has identified the key categories for the inventory using the Tier 1 level and trend assessments as recommended in the IPCC 2006 Guidelines (Volume 1, Chapter 4) and adopted by the MPGs. This approach identifies sources that together contribute to 95 per cent of the total emissions or 95 per cent of the trend of the inventory in absolute terms.

A key category has a significant influence on a country's total inventory of direct greenhouse gases in terms of absolute level of emissions, the trend in emissions, or both. Solomon Islands has identified the key sources for the inventory using the tier 1 level and trend assessments as recommended in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006). This approach identifies sources that contribute to 95 per cent of the total emissions or 95 per cent of the trend of the inventory in absolute terms.

Solomon Islands has identified the following sectors as the key categories (without considering LULUCF sector in the analysis) to the total national GHG emissions and presented in table 1.3 (level assessment) and table 1.4 (trend assessment):

Table 1.3: Key Category Analysis (KCA) results (without LULUCF sector): Level assessment

Category code	Category	Greenhouse gas	Level Assessment (%)	Cumulative (%)
3.B	Manure Management	METHANE (CH_4)	26.8%	26.8%
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	22.6%	49.4%
1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	16.2%	65.7%
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	11.4%	77.1%
5.A	Solid Waste Disposal	METHANE (CH_4)	5.5%	82.5%
3.B	Manure Management	NITROUS OXIDE (N_2O)	4.2%	86.7%
1.A.3.a	Civil Aviation	CARBON DIOXIDE (CO_2)	3.2%	89.9%
5.D	Wastewater Treatment and Discharge	METHANE (CH_4)	2.2%	92.1%
3.A	Enteric Fermentation	METHANE (CH_4)	1.9%	94.1%
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	1.9%	95.9%

Table 1.4: Key Category Analysis (KCA) results (without LULUCF sector): Trend assessment (1994-2022)

Category code	Category	Greenhouse gas	1994 Year Estimate (Gg CO2 Eq)	2022 Year Estimate (Gg CO2 Eq)	Level Assessmen t (%)	Cumulati ve (%)
1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	192.85	93.69	52%	52%
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	0.00	130.60	24%	76%
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	48.61	10.68	15%	92%
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	53.68	65.64	7%	99%

When the LULUCF sector is included in the analysis, the most significant key categories are Forest Land remaining Forest Land (4A1) using level assessment. While for trend assessment 1.A.3.b Road Transportation, 1.A.4 Other Sectors and 1.A.1 Energy Industries are the key categories. The full analysis is detailed in Annex I of this Report.

1.2.6. Brief general description of QA/QC plan and implementation

A Quality Assurance/Quality Control (QA/QC) plan is a review mechanism that is an integral part of the process and was devised in order to improve transparency, consistency, comparability, completeness, and accuracy of national greenhouse gas inventory. The QA/QC plan established during previous submissions was retained and followed for the First Biennial Transparency Report (BTR1). An internal QA/QC plan was developed, outlining the roles and responsibilities of the GHG Inventory Team Members. The QA/QC process and review mechanism were implemented at all levels, including data collection, inventory preparation, and reporting, to ensure the quality and reliability of the inventory.

The inventory development team routinely conducted checks consistency of the data and information provided by the different stakeholders (line ministries, government departments, Organizations, Public and private sector, etc.), to ensure data integrity, correctness, and completeness. In case of discrepancy or incompleteness, the inventory team consulted the relevant stakeholders and experts to reduce the data uncertainty, appropriate corrections, address errors and omissions. The sub-sectoral and sectoral calculations of GHGs were shared with the Technical Working Groups (TWGs) for technical review of categories and sub-category activity data, emission factors, estimation parameters, and calculation methods. The inputs provided by the TWGs were addressed and GHG emission reduction calculation was revised. Further, some suggestions will be considered during the next National GHG Inventory and reporting cycle. Upon finalization of the GHG Inventory calculations, a draft report was prepared and shared with the TWGs.

Further, the draft report and GHG inventory calculations presented during the stakeholder consultation to seek inputs and finalize the report. The main outcomes of QA/QC and review process was overall improvement in the quality of data collection, calculations, reporting and inclusion of the key criteria analysis, uncertainty estimates and subsequent improvements in the future GHG Inventory i.e. National Inventory Improvement Plan (NIIP).

1.2.6. General uncertainty assessment, including data pertaining to the overall uncertainty of inventory totals

The uncertainty analysis on the national GHG inventory has been carried out as per the IPCC general guidance on uncertainty assessment[7]. The main objective of the uncertainty analysis is to identify the categories that have the greatest uncertainty contribution in the total GHG inventory estimation and the trend uncertainty with the objective of prioritizing improvements and distributing resources to reduce their uncertainties as much as possible. As per the 2006 IPCC Guidelines, Approach 1 i.e., analysis by using the error propagation equation has been used. Approach 1 is based on error propagation and is used to estimate uncertainty in individual categories, in inventory, and in trends between reporting year 2022 and base year 1994. Uncertainties from disaggregated levels are combined by multiplying the default uncertainty values.

The overall uncertainty in national emissions i.e., Percentage uncertainty in total inventory for the year 2022 was estimated as 74.43%; and the trend in national emissions between the base year and the current year (1994 -2022) has been estimated as 7785.20%.

In Solomon Islands, key uncertainties are associated with lack of high-quality, complete, country-specific, and recent data leading to the use of assumptions, default data, and splicing techniques.

[7] http://www.ipccnggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_3_Ch3_Uncertainties.pdf

1.2.7. General assessment of completeness

The IPCC Guidelines provides a comprehensive overview and categorization of all potential sources of GHG emissions; however not all of them are relevant to Solomon Islands. Furthermore, there is insufficient data on certain sources for them to be included in this inventory exercise.

This has been discussed in the sections below, a detailed assessment of each IPCC category was carried out as part of Solomon Islands national GHG inventory, including each category's relevance to Solomon Islands and the availability of data required to estimate emissions from these categories. Table 1.4 below provides a summary of the completeness of the GHG inventory for the year 2021 & 2022.

Table 1.4. Summary of completeness of the national GHG inventory for year 2021 & 2022

Categories	Remarks
1. Energy	Estimated
1.A. Fuel combustion	Estimated
1.A.1. Energy industries	Estimated
1.A.2. Manufacturing industries and construction	NO
1.A.3. Transport	Estimated
1.A.4. Other sectors	Estimated
1.A.5. Other	NO
1.B. Fugitive emissions from fuels	NO
1.B.1. Solid fuels	NO
1.B.2. Oil and natural gas and other emissions from energy production	NO
1.C. CO2 transport and storage	NO
2. Industrial processes	NO
2.A. Mineral industry	NO
2.B. Chemical industry	NO
2.C. Metal industry	NO
2.D. Non-energy products from fuels and solvent use	Estimated
2.E. Electronic Industry	NO
2.F. Product uses as ODS substitutes	Estimated
2.G. Other product manufacture and use	NO
2.H. Other	NO
3. Agriculture	Estimated
3.A. Enteric fermentation	Estimated
3.B. Manure management	Estimated
3.C. Rice cultivation	NO
3.D. Agricultural soils	Estimated
3.E. Prescribed burning of savannahs	NO
3.F. Field burning of agricultural residues	NO
3.G. Liming	NO
3.H. Urea application	Estimated
3.I. Other carbon-containing fertilizers	NO
3.J. Other	NO
4. Land use, land-use change and forestry	Estimated
4.A. Forest land	Estimated
4.B. Cropland	NE
4.C. Grassland	NE
4.D. Wetlands	NE
4.E. Settlements	NE
4.F. Other land	NE
4.G. Harvested wood products	NE
4.H. Other	NO
5. Waste	Estimated
5.A. Solid waste disposal	Estimated
5.B. Biological treatment of solid waste	NE

5.C. Incineration and open burning of waste	NE
5.D. Waste water treatment and discharge	Estimated
5.E. Other	NO
6. Other	NO
Abbreviations: NA - Not Applicable; NE - Not Estimated; NO - Not Occurring	

1.2.8 Metrics

Consistent with paragraph 37 of the MPG, this Report is prepared using 100-year time-horizon global warming potential (GWP) values from the IPCC Fifth Assessment Report (AR5) and outlined in table 1.5 below:

Table 1.5. Global Warming Potential of various gases as per IPCC Fifth Assessment Report

Gas	GWP
CO_2	1
CH_4	28
N_2O	265
HFC-22	1760
HFC-32 (R-32)	677
HFC-134a (R-134a)	1300
R-404A	3943
R-407C	1624
R-410A	1924
R-507A	3985
HFC-125	3170
HFC-134a (R-134a)	1300
HFC-143a	4800
HFC-22	1760

1.2.9 Summary of any Flexibility Applied

In accordance with paragraph 57 of the UNFCCC MPGs for the ETF (Annex to decision 18/CMA.1), a consistent annual time series starting from 1990 shall be reported. However, the starting year for the time series that is reported in the report is from the year 1994 to 2022. Furthermore, due to limited time availability and availability of historical data, the activity data for each category is reported and presented for the inventory years for which the data was available. Efforts will be undertaken to acquire historical data to enhance the completeness of GHG inventory reporting in future inventory submission and we will continue to ensure time series consistency when the inventory time series starting from 1990 is included in future reports.

Use of Flexibility in QA/QC Plan Reporting

Solomon Islands recognizes the importance of implementing a robust Quality Assurance/Quality Control (QA/QC) plan for its Greenhouse Gas Inventory (GHGI) in line with the Modalities, Procedures, and Guidelines (MPGs) under the Enhanced Transparency Framework (ETF). Paragraph 35 of the MPGs states that while all Parties shall implement and provide information on general inventory QC procedures in accordance with their QA/QC plan and the IPCC guidelines, developing country Parties that need flexibility are encouraged to do so in light of their capacities.

Justification for Flexibility

As a Small Island Developing State (SIDS), Solomon Islands faces resource and capacity constraints that impact the full development and implementation of a detailed QA/QC plan. Despite these challenges, Solomon Islands remains committed to transparency and continuous improvement in its national inventory system. Given these limitations, Solomon Islands is applying flexibility in its QA/QC reporting as permitted under the MPGs.

Existing QA/QC Measures

While a comprehensive QA/QC plan is yet to be fully developed, Solomon Islands has implemented the following measures to ensure the quality of its GHGI:

- Internal validation of data sources and methodologies used in the inventory.
- Engagement with relevant national stakeholders to verify activity data.
- Application of basic consistency checks and expert judgment in the estimation process.

Future Improvements and Capacity Building

Solomon Islands is committed to strengthening its QA/QC framework and will undertake the following steps:

- Develop a full QA/QC plan aligned with the IPCC 2006 Guidelines and best practices.
- Enhance institutional capacity through training and technical support for inventory compilers.
- Implement category-specific QC procedures for key categories and significant methodological changes.
- Establish an external peer review mechanism to improve transparency and accuracy over time.

By applying this flexibility, Solomon Islands is ensuring that its GHGI remains transparent and credible while acknowledging existing constraints. The country is actively working toward a progressive enhancement of its QA/QC procedures, demonstrating its commitment to meeting the transparency requirements under the ETF.

Use of Flexibility for Time Series Reporting

Solomon Islands acknowledges the requirement under Paragraph 57 of the UNFCCC Modalities, Procedures, and Guidelines (MPGs) for the Enhanced Transparency Framework (ETF) (Annex to Decision 18/CMA.1) to report a consistent annual time series starting from 1990. However, due to limitations in historical data availability and time constraints, the current inventory submission reports emissions from 1994 to 2022, with activity data presented for the period 2000–2022.

Justification for Flexibility

As a Small Island Developing State (SIDS) with limited historical records and institutional capacity challenges, Solomon Islands faces difficulties in retrieving and verifying reliable data for earlier years. Despite these constraints, efforts have been made to ensure that the reported time series remains as complete and accurate as possible given the available data.

Commitment to Improvement

To enhance time series completeness and consistency, Solomon Islands is committed to the following actions:

- Efforts to acquire historical data through collaboration with national agencies, archives, and international sources.
- Application of time series consistency methods in line with IPCC guidelines when integrating additional historical data.
- Capacity-building initiatives to strengthen institutional mechanisms and implementation of MRV system for long-term data collection and archiving.

While the current submission does not fully meet the requirement for a time series starting from 1990, Solomon Islands remains committed to progressively enhancing its GHGI. Future submissions will incorporate earlier data as it becomes available while ensuring consistency and transparency in line with ETF requirements.

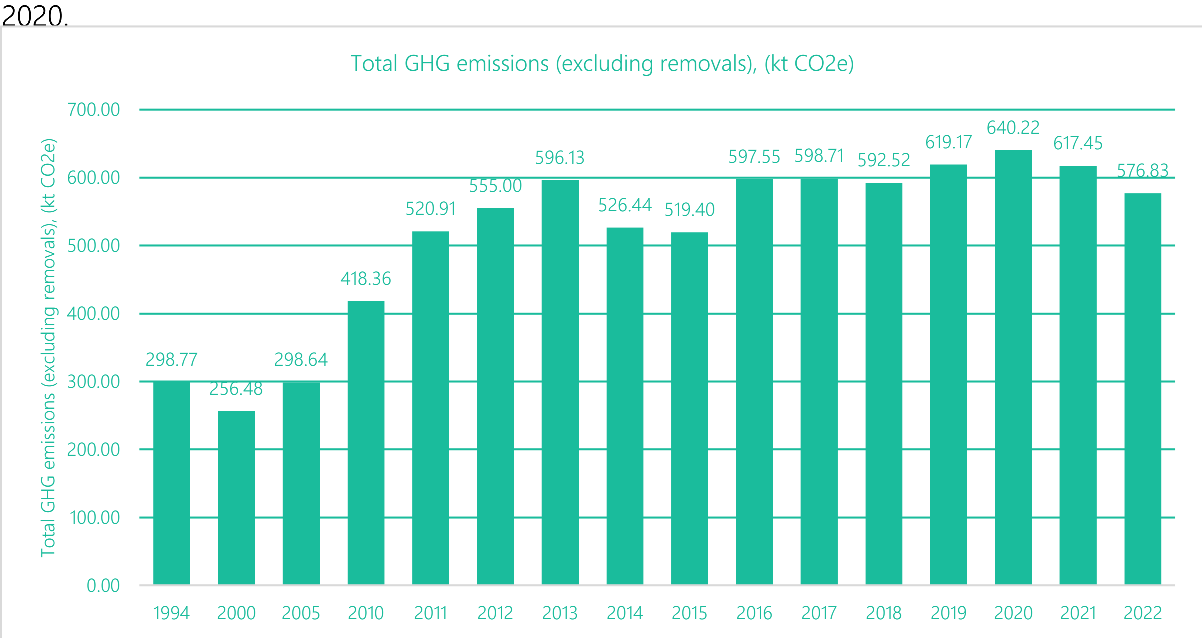
Chapter 2: Trends in greenhouse gas emissions and removals

2.1. Description of emission and removal trends for aggregated GHG emissions and removals

2.1.1 Overview of emissions trends since 1994

The trends in emissions of the greenhouse gases in Solomon over the time series 1994-2022 are shown in Figure 2.1 and 2.2. Solomon Islands the total greenhouse gas (GHG) emissions in increased from 298.77 kt CO_2 eq in 1994 to 576.83 kt CO_2 eq in 2022. This represents an increase in emissions of 93% during this period.

In 1994, GHG emissions stood at 298.77 kt CO_2e. Emissions slightly decreased in 2000 to 256.48 kt CO_2e but returned to nearly the same level in 2005 (298.64 kt CO_2e). A sharp upward trend began after 2005, with emissions rising to 418.36 kt in 2010 and reaching 502.20 kt by 2012. The peak for the early 2010s occurred in 2013 at 596.13 kt CO_2e, followed by a slight dip in the subsequent years 526.44 kt CO_2e in 2014 and 519.40 kt CO_2e in 2015. From 2016 onwards, emissions showed a steady rise again, reaching 597.55 kt in 2016 and peaking at 640.22 kt in 2020.



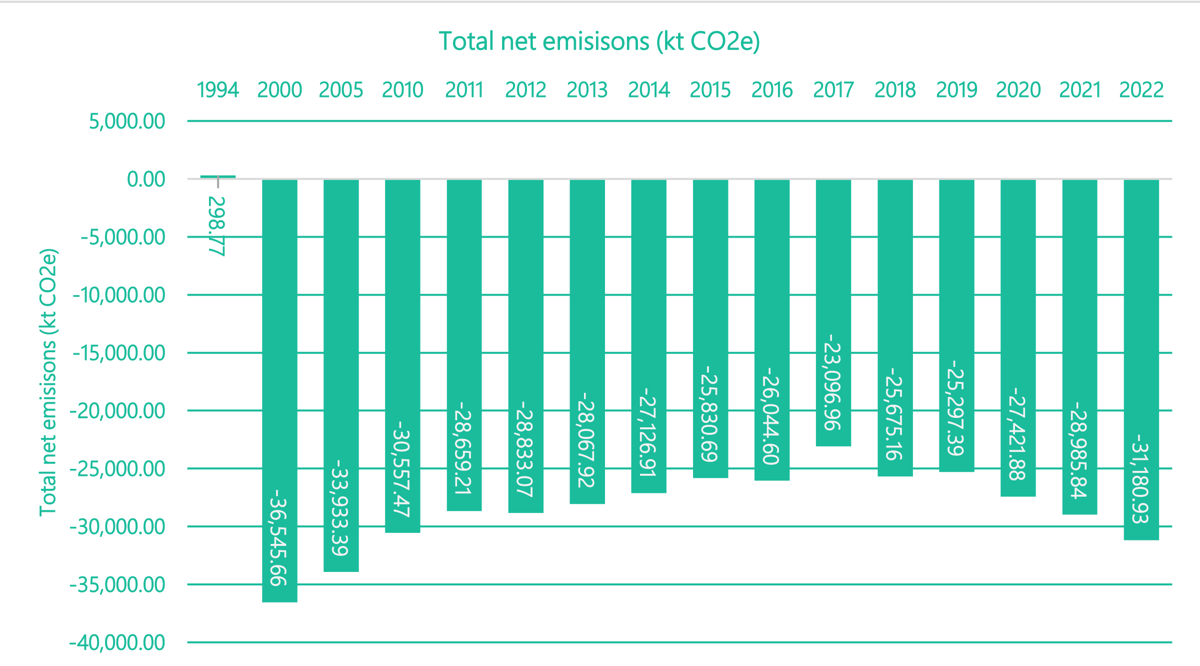
Furthermore, a comparison of emissions from the NDC reference period (2015) has also been made and presented in table 2.1 below. The comparison reveals that the emissions from the Energy sector have increased over the period 2015-2022 by about 4%. IPPU emissions increased by 24% whereas agriculture sector emissions increased by 17% during this period. This increase is mainly due to the increase in livestock population, mainly swine and poultry and poor waste manure management practices. Cattle population has decreased significantly in Solomon Islands. The emissions from the Land use, land-use change and forestry (LULUCF) sector also decreased by 17%. This is attributed to improvement in sustainable management of forests. While the waste sector also shows an increasing trend (18%) mainly attributed due to improving waste management practices in the country. By and large the GHG emissions (excluding removals) show an increase in emissions by 10% during the period 2015-2022.

Table 2.1: Comparison of 2022 emissions with past emissions levels by sector, CO_2 eq and percent change (%)

Emissions Sector	2022 emissions (Gg CO_2e)	1994 emissions (Gg CO_2e)	% change in 2022 since 1994	2015 emissions (Gg CO_2e)	%change in 2022 since NDC Reference period (2015)
1. Energy	323.23	298.77	8	309.60	-4%
2. Industrial Processes and Product Use	0.49	NO	100	0.37	-24%
3. Agriculture	198.74	NE	199	164.58	-17%
4. Land use, land use change and forestry	-31,757.76	NE	-14	-26,350.09	-17%
5. Waste	54.37	NE	100	44.85	-18%
Total emissions (excluding removals), kt CO2e	576.83	298.77	93	519.40	-10%
Total emissions (with removals), kt CO2e	-31,180.93	298.77	-10,536	-25,830.69	-17%

However, Solomon Islands is net carbon negative, since the Land use, land-use change and forestry (LULUCF) sector is a net sink of CO_2 in Solomon Islands. the net GHG emissions amounted to –31,180.93 kt CO_2 eq.

Figure 2.2: Total net GHG emissions per year, kt CO_2 eq

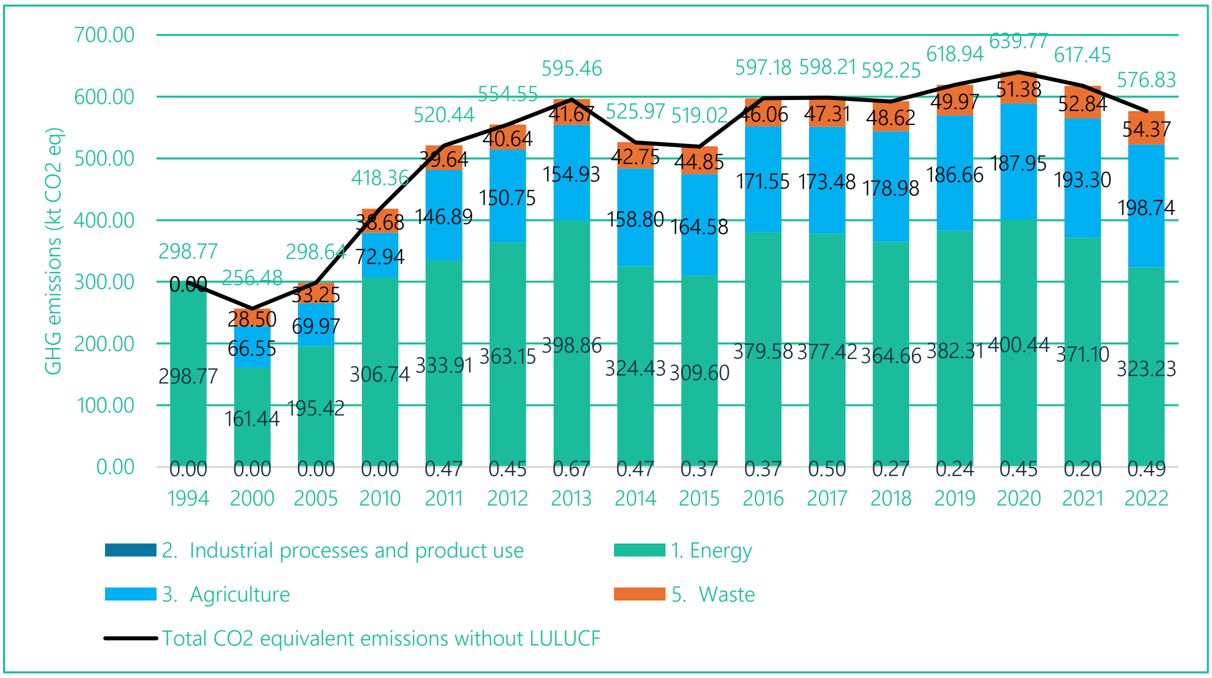


2.2. Description of emission and removal trends by sector and by gas

This section of the report presents an analysis of Solomon Islands Greenhouse Gas (GHG) emission estimates across key emission intensive sectors namely Energy, Agriculture, Land use, land-use change and forestry (LULUCF), and Waste sector. As well as by major gases – Carbon dioxide (CO_2), Methane (CH_4) and Nitrous oxide (N_2O) and Hydrofluorocarbons (HFCs) and other indirect gas (NOx, CO, NMVOCs and SO_2) for the years 1994-2022.

The trend in total GHG emissions (excluding removals) for Solomon Islands is presented in the following figure 2.3.

Figure 2.3: Total GHG emissions per year (excluding removals), kt CO_2 eq



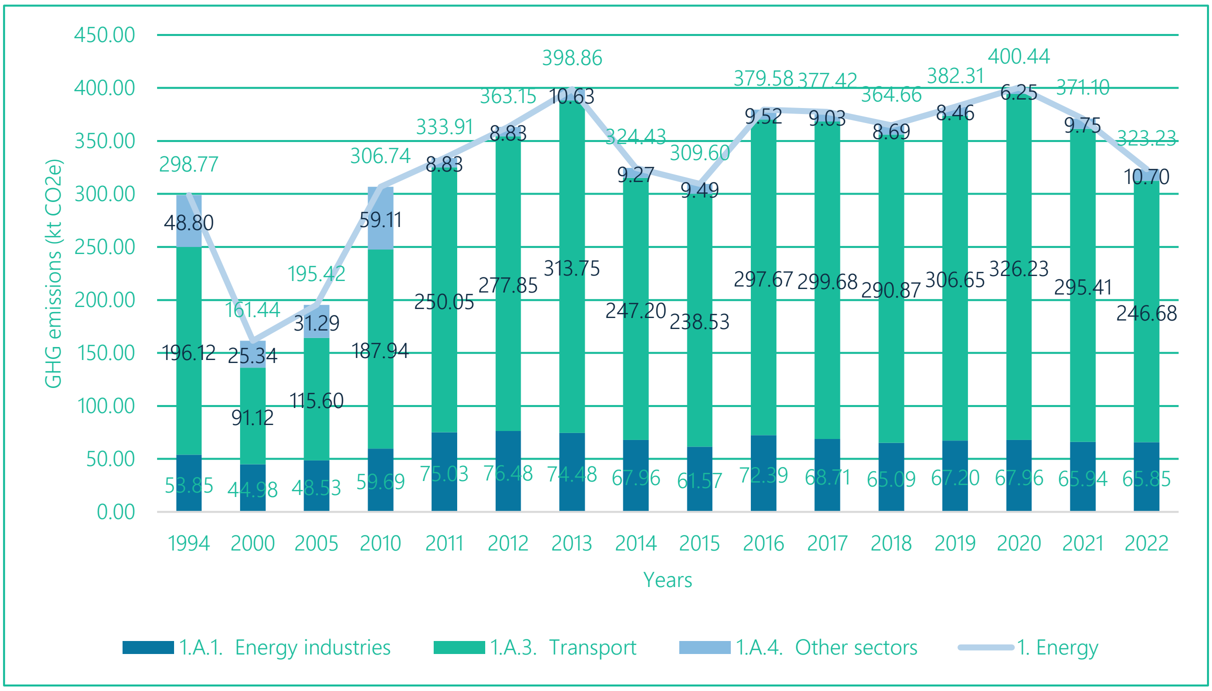
As can be seen in figure 2.3, the key sector with increasing emissions over the reporting period 1994-2022 includes the Energy sector, followed by Agriculture and waste sector. A detailed analysis of the trend in each sector is discussed in the following subsections.

2.2.1 Sectoral trends

Energy

The energy sector is the largest GHG emissions contributing sector in the Solomon Islands total national GHG inventory (excluding removals). The energy sector and sub-sectors show an increasing trend over the period 1994-2022. This is mainly due to the increasing energy demand from the rising population of the country and increase in economic activities.

Figure 2.4: Energy sector GHG emissions per year (excluding removals), kt CO_2 eq

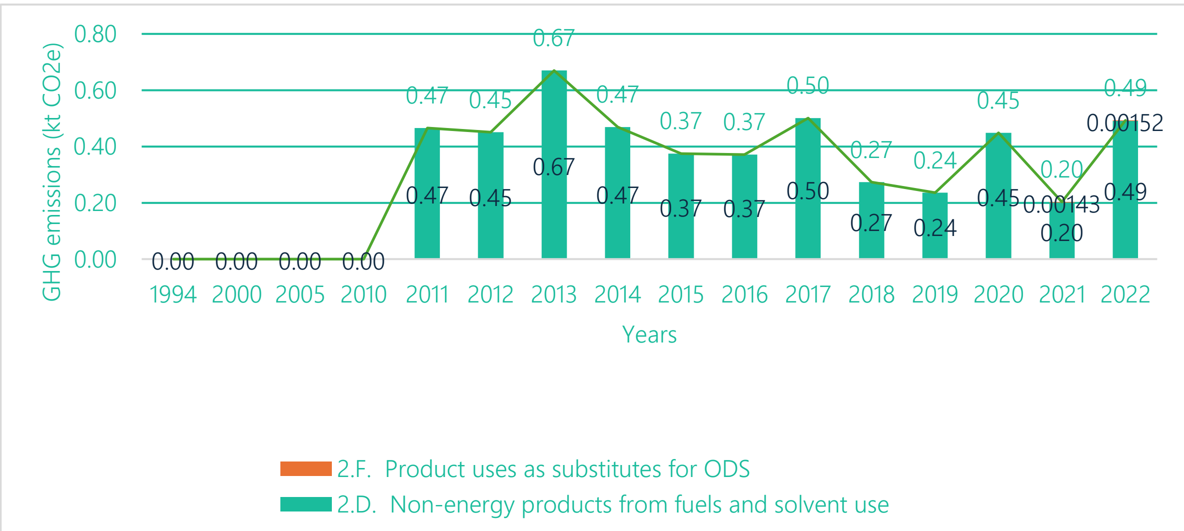


Overall, the energy sector emissions have increased by 8.19% during the period 1994-2022. The transport sector shows a high increase in the trend (25.87%), followed by energy industries (2.28%). While the other sectors represent a decreasing trend (decreasing by 78.07%) over the period 1994-2022.

Industrial Processes and Product Use (IPPU)

The IPPU sector emissions contribution is very small in the total national GHG emissions (excluding removals) and is mainly attributed due to the non-energy products from fuels and solvent use (mainly Lubricants) and Product uses as substitutes for ODS (mainly HFCs consumption as refrigerants). Due to unavailability of data for industrial activity before 2010, emissions from the IPPU sector for the years 1994 to 2010 have not be estimated.

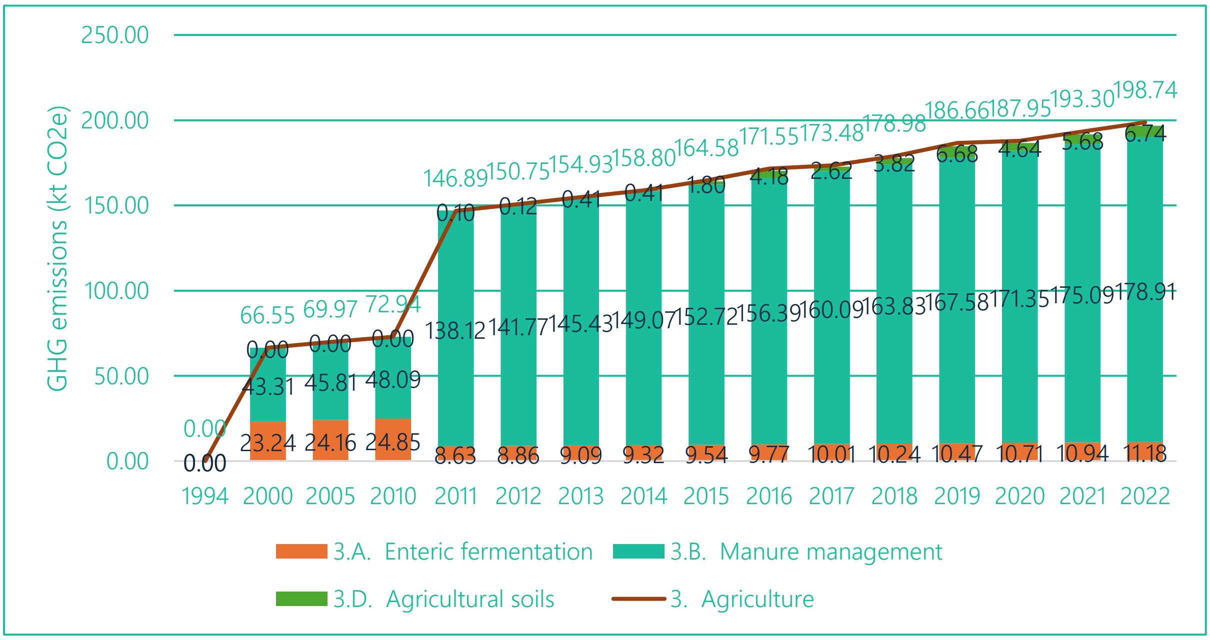
Figure 2.4: IPPU sector GHG emissions per year (excluding removals), kt CO_2 eq



Agriculture

The agriculture sector is the second largest GHG emissions contributing sector to the Solomon Islands total national GHG emissions (excluding removals). As can be seen in figure 2.5, the emissions show an increasing trend in both Enteric fermentation and Manure management and Agricultural soils mainly attributed to the rising livestock population (swine and poultry) and augmented by poor manure management practices. The cattle population has decreased significantly over the period. The emissions from the agricultural sector were not estimated for the year 1994. By way of comparison, the overall emissions from this sector increased by 198.65% during the period 2000-2022.

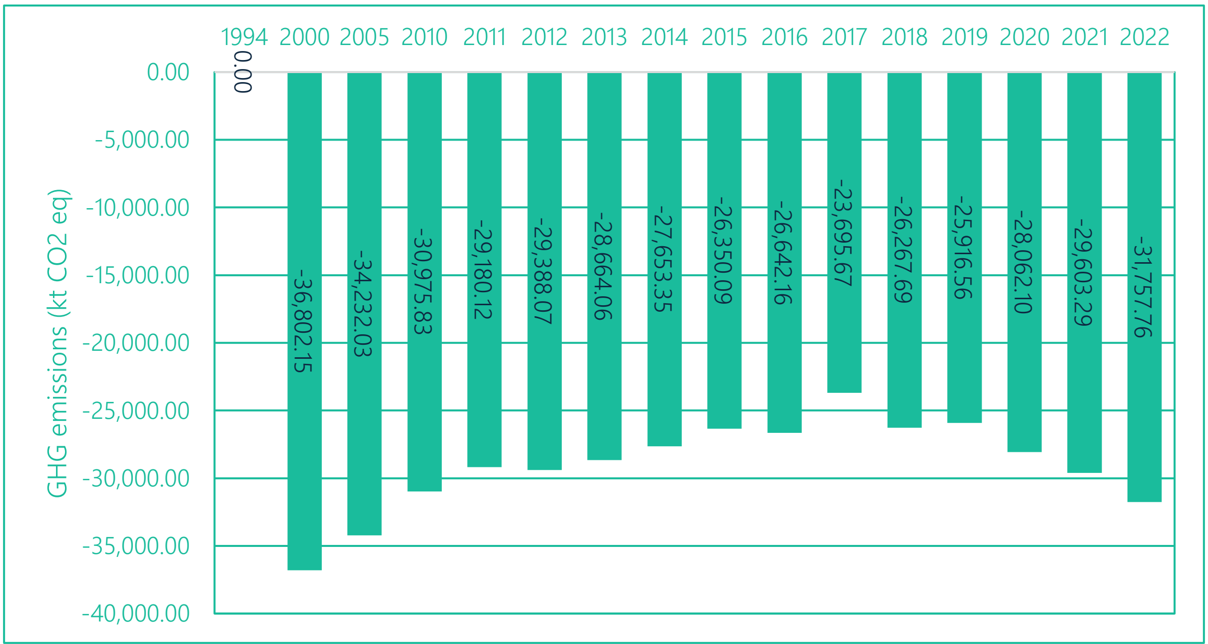
Figure 2.5: Agriculture sector GHG emissions per year (excluding removals), kt CO_2 eq



Land use, land-use change and forestry (LULUCF)

The figure 2.6 below presents the GHG emissions from the LULUCF sector mainly from the Forest land remaining forest land. The GHG emissions from this category were not estimated for the base year 1994. However, the trend analysis shows that the GHG emissions from this category have increased by 13.71% during the period 2000-2022. As discussed above, the Solomon Islands is net carbon negative, since the LULUCF is a net sink of CO_2 in Solomon Islands.

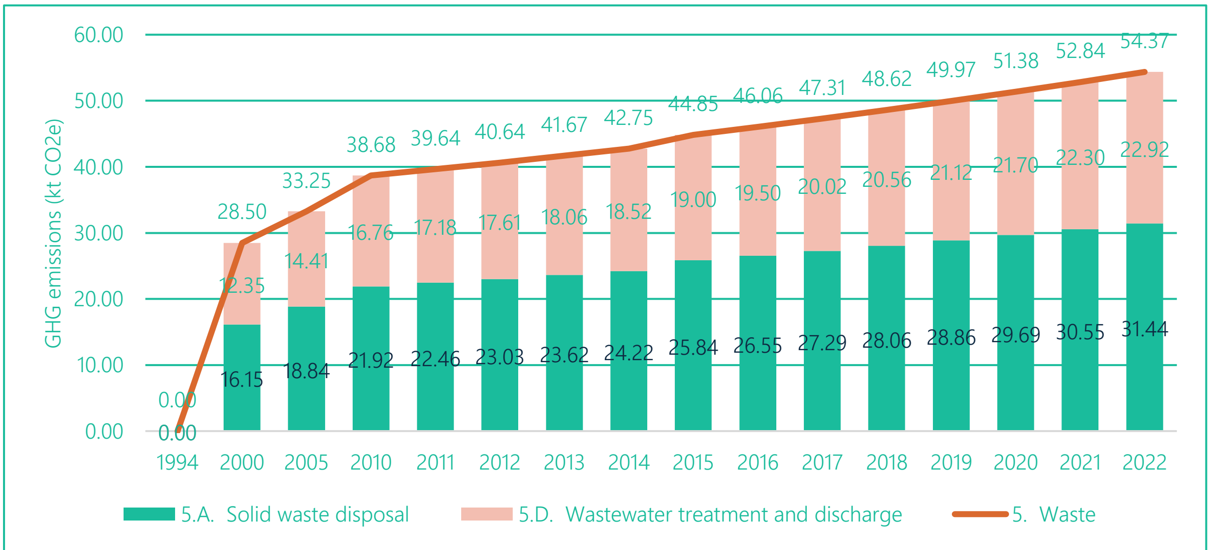
Figure 2.6: Land use, land-use change and forestry sector GHG emissions per year (excluding removals), kt CO_2 eq



Waste

Waste sector emissions were not estimated during the year 1994. While in the absence of actual monitored data for the period 2000-2022, the MSW generation in Solomon Islands estimated from the total population of the country and the MSW generation rate of 71.50 kg/capita/year as provided in the Solomon Islands National Waste Audit Analysis Report 2023[8] for estimating the GHG emissions. By and large, the waste sector emission has increased over the period 1994-2022 and is mainly due to increase in population and increasing consumption pattern of population.

Figure 2.7: Waste sector GHG emissions per year (excluding removals), kt CO_2 eq



[8] Solomon Islands national waste audit analysis. Report (August 2023). Apia, Samoa : SPREP, 2023. https://pacwasteplus.org/wp-content/uploads/2023/08/Solomon-Islands-National-Waste-Audit-Analysis-Report.pdf

2.2.2 Trends by gas

Table 2.2 shows the individual GHG emissions and the values of total emissions for the period 1994-2022, as well as the change in total national GHG emissions for each year compared to the baseline 1994 level.

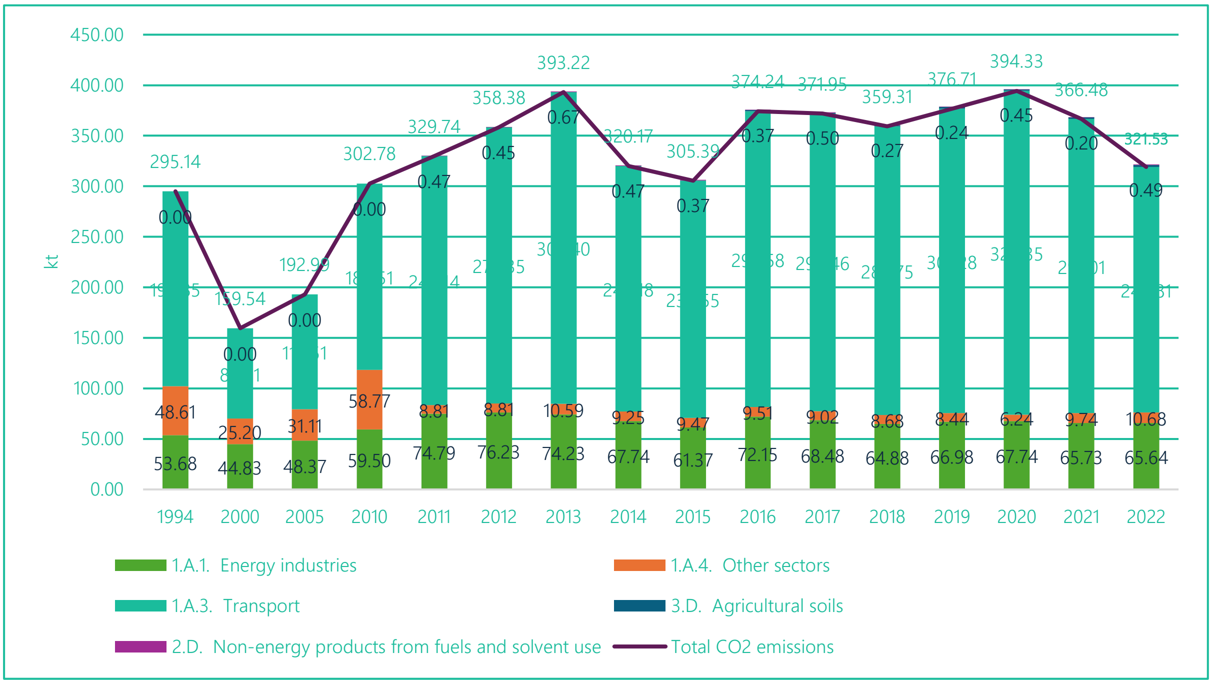
Table 2.2: Greenhouse gas emissions kt (excluding removals)

Year	CO_2 (kt CO_2 eq)	CH_4 (kt CO_2 eq)	N_2O (kt CO_2 eq)	HFCs (kt CO_2 eq)	Unspecified mix of HFCs and PFCs (kt CO_2 eq)	Total Emissions kt CO_2 eq
1994	295.14	0.02	0.01	–	–	295.17
2000	159.54	2.88	0.06	–	–	162.49
2005	192.99	3.13	0.07	–	–	196.19
2010	302.78	3.38	0.08	–	–	306.24
2011	330.23	5.73	0.11	–	–	336.07
2012	358.83	5.88	0.12	–	–	364.83
2013	393.89	6.03	0.13	–	–	400.05
2014	320.64	6.18	0.12	–	–	326.94
2015	306.28	6.36	0.13	–	–	312.78
2016	375.81	6.52	0.15	–	0.0002	382.48
2017	373.21	6.68	0.14	–	0.0004	380.04
2018	360.67	6.84	0.15	–	0.0003	367.67
2019	378.87	7.01	0.17	–	0.0001	386.04
2020	396.03	7.17	0.16	0.00052	0.0008	403.37
2021	368.27	7.34	0.16	0.00055	0.0014	375.77
2022	321.53	7.51	0.17	0.00065	0.0015	329.20
% difference 1994-2022	9%	48630%	1309%	–	–	12%
% in 2022	55.7%	1.3%	0.0%	0.0001%	–	100%
% difference 2015-2022	5%	18%	29%	–	–	5%

Carbon dioxide (CO_2)

The energy sector and sub-sectors are the main source of CO_2 emissions followed by the IPPU sector- non-energy products from fuels and solvent use of CO_2 emissions and Urea application. The CO_2 emissions from Solomon Islands has shown the increasing trend during 1994-2022, the CO_2 emissions in year 1994 was 295.14kt and increased to 321.53 kt in 2022, indicating increase by 8.94%. The combustion of fossil fuels remains the main contributor of CO_2 emissions in Solomon Islands.

Figure 2.8: CO_2 emissions (excluding removals), kt



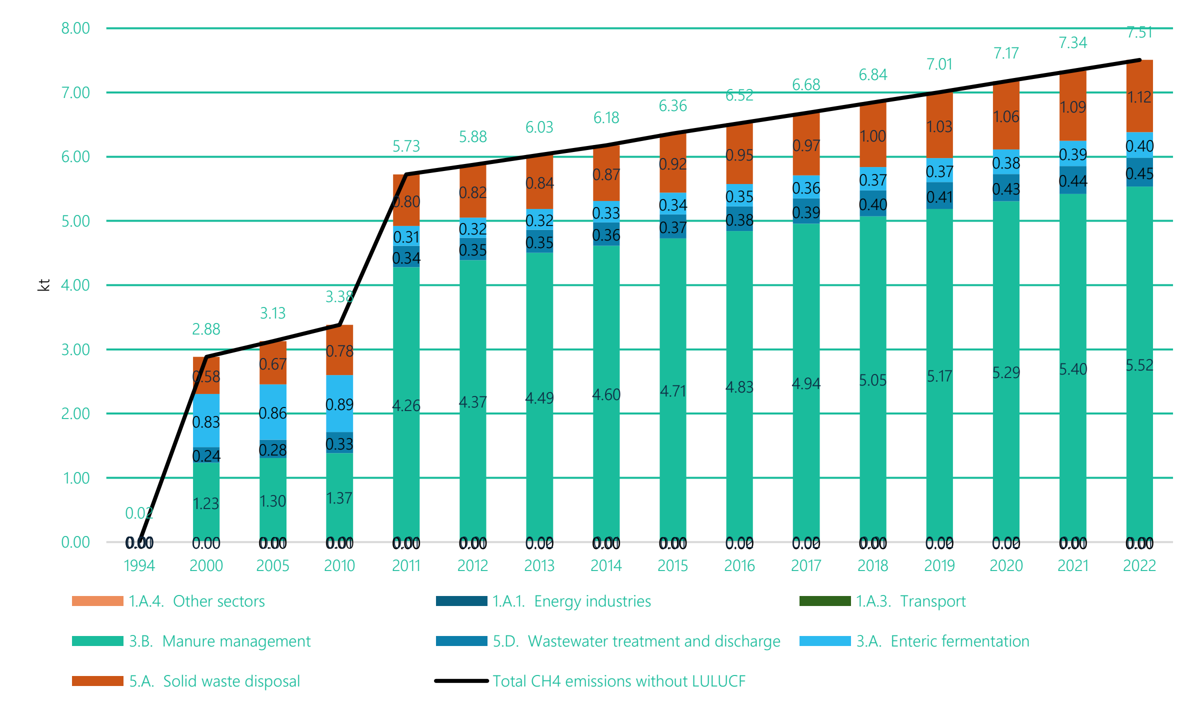
Within the energy sector, the transport sector is the key CO_2 emitting sector followed by energy industries, and the other sector (commercial/institutional and residential) respectively.

Methane (CH_4)

CH_4 is the most potent GHG in Solomon Islands after CO_2. About 78.8% of CH_4 emission in Solomon Islands comes from the agriculture sector, mainly enteric fermentation and manure management, and agricultural soils. This is followed by the waste sector (MSW solid waste, wastewater), accounting for about 21.0% of emissions. A small contribution of methane comes from the energy sector; mainly as the emissions from combustion of fossil fuel (0.2%).

In 2022, Methane emissions were 7.51 kt compared to 0.02 kt in 1994, indicating an increase by 48,629.47% over the period 1994-2022.

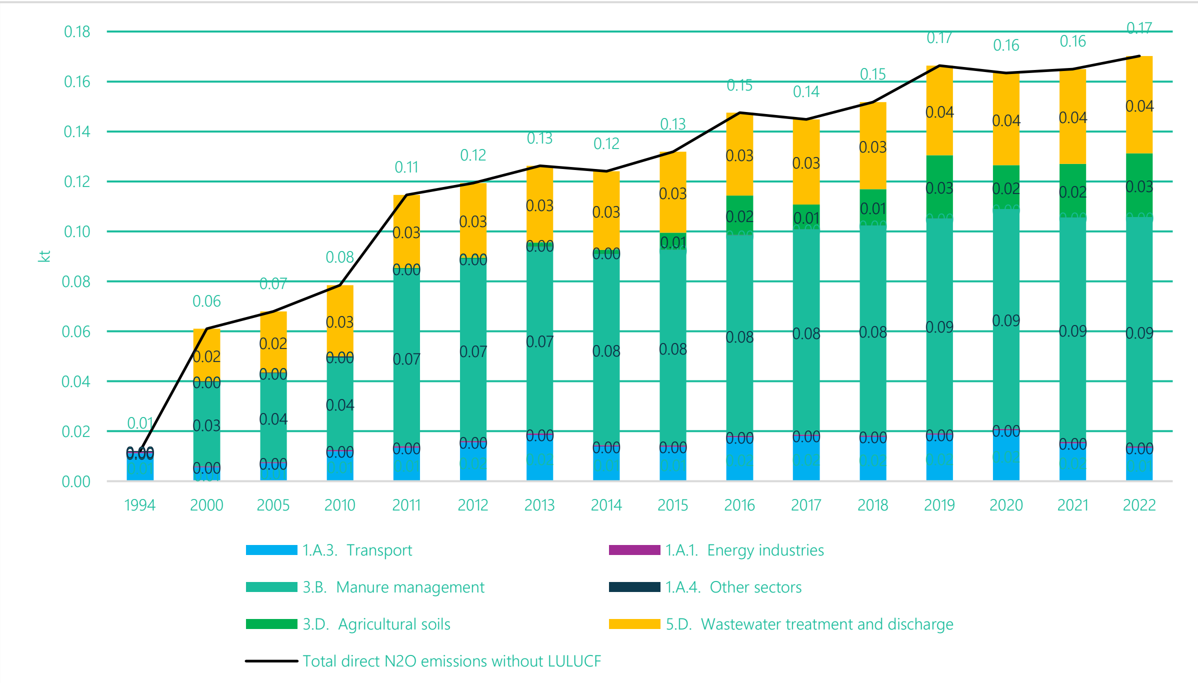
Figure 2.9: CH_4 emissions (excluding removals), kt



Nitrous oxide (N_2O)

The Nitrous oxide (N_2O) emissions in Solomon Islands were 0.17 kt in 2022 and 0.01 kt in 1994, which indicates an increase of about 1308.85% during the period 1994-2022. The main source of N_2O emissions in Solomon Islands was from livestock (manure management) (54%), Agricultural soils (15%) Wastewater treatment and handling (23%) and energy sector (8%) mainly transport sector tail gas emissions (mobile combustion) and minor emission from stationery combustion.

Figure 2.10: N_2O emissions (excluding removals), kt



Hydrofluorocarbons (HFCs)

Solomon Islands has ratified the Kigali Amendment, making the South Pacific archipelago the 132nd country pledged to phase down HFC refrigerants. Solomon Islands does not produce any ODS however it gets imports in small quantity in the form of refrigerants in Air conditioners and refrigeration systems. The emissions from the HFCs consumption have been estimated for the first time and included in this inventory. Solomon Islands has estimated the emissions from HFCs to be about 0.00152 kt CO_2 eq in 2022.

PFCs, SF_6 and NF_3

The emission from other direct GHGs i.e., perfluorocarbons (PFCs) and Sulphur hexafluoride (SF6) have not been included here since HFCs, PFCs, SF_6 are not directly imported or sold in Solomon Islands; hence direct emission of these gases does not occur; however small amount of these gases present in equipment like ACs, refrigerators, switchboards and circuit-breakers, etc.

Indirect Greenhouse Gases (NOx, CO, NMVOC and SO_2)

Apart from the direct GHG emissions in Solomon Islands the other indirect emissions of NOx, CO, NMVOC and SO_2 takes place. However, they are not the main source of GHGs and have small quantum. These emissions are not counted under national total GHG emissions. The emissions of these indirect gases are estimated to occur from the Energy Sector (Energy Industries, Transport, Other sectors- Commercial, Institutional and Residential).

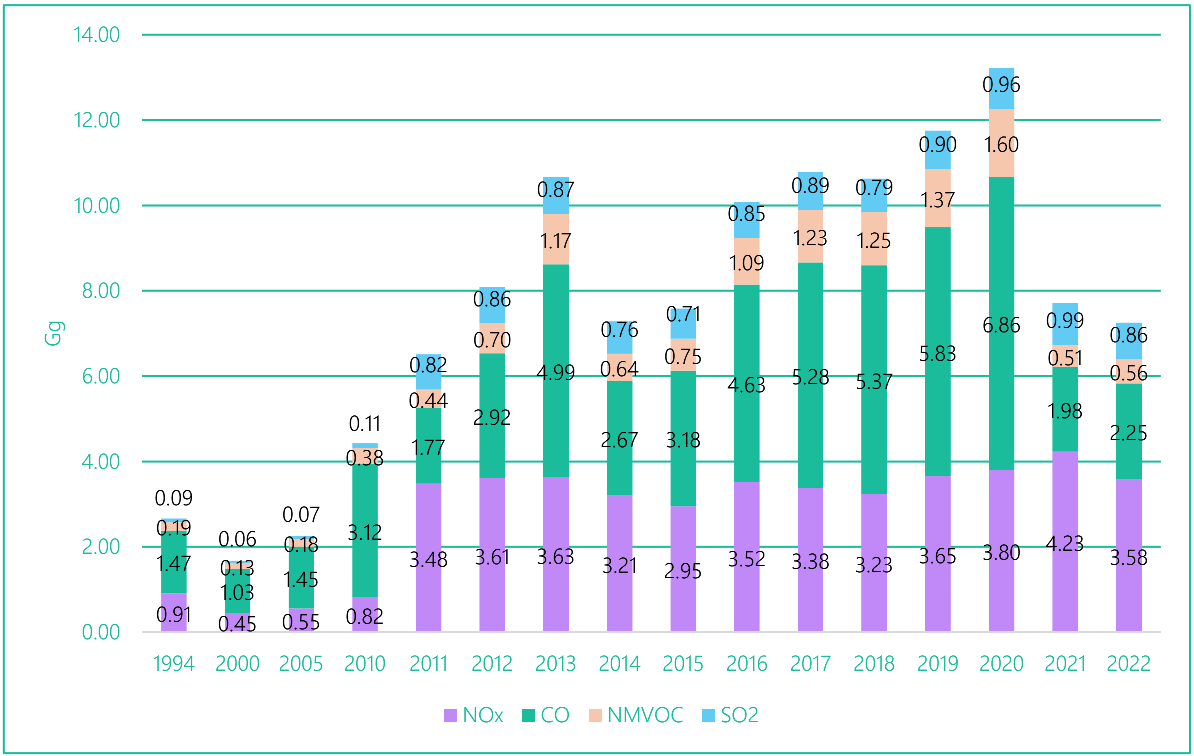
The following table and figure present the NOx, CO, NMVOCs and SO_2 emission trend in Solomon Islands for the year.

Table 2.3: Indirect GHG emissions (NOx, CO, NMVOC and SO_2) (excluding removals), kt

Year	NOx	CO	NMVOC	SO_2
1994	0.91	1.47	0.19	0.09
2000	0.45	1.03	0.13	0.06
2005	0.55	1.45	0.18	0.07
2010	0.82	3.12	0.38	0.11
2011	3.48	1.77	0.44	0.82
2012	3.61	2.92	0.70	0.86
2013	3.63	4.99	1.17	0.87
2014	3.21	2.67	0.64	0.76
2015	2.95	3.18	0.75	0.71
2016	3.52	4.63	1.09	0.85
2017	3.38	5.28	1.23	0.89
2018	3.23	5.37	1.25	0.79
2019	3.65	5.83	1.37	0.90
2020	3.80	6.86	1.60	0.96
2021	4.23	1.98	0.51	0.99
2022	3.58	2.25	0.56	0.86

% change 1994-2022	2.94	0.53	1.92	8.83

Figure 2.11: Indirect GHG emissions (NOx, CO, NMVOC and SO_2) (excluding removals), kt



Chapter 3: Energy (CRT sector 1)

3.1. Overview of the sector

In line with the 2006 IPCC Guidelines, following are the categories that are covered in the energy sector of Solomon Islands.

- 1.A.1. Energy Industries
- 1.A.3 Transport
- 1.A.4 Other sectors (Commercial/Institutional, Residential)

The energy sector is the largest GHG emission sector in Solomon Islands. The total GHG emission from energy sector was 323.23 kt CO_2 eq in 2022, which is about 51.9% of the total national GHG emissions (excluding removals).

The inventory covers the following in the sector:

– greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O);

– indirect gases: nitrogen oxides (NOx), carbon monoxide (CO), non-methane volatile organic compounds (NMVOCs), Sulphur dioxide (SO_2).

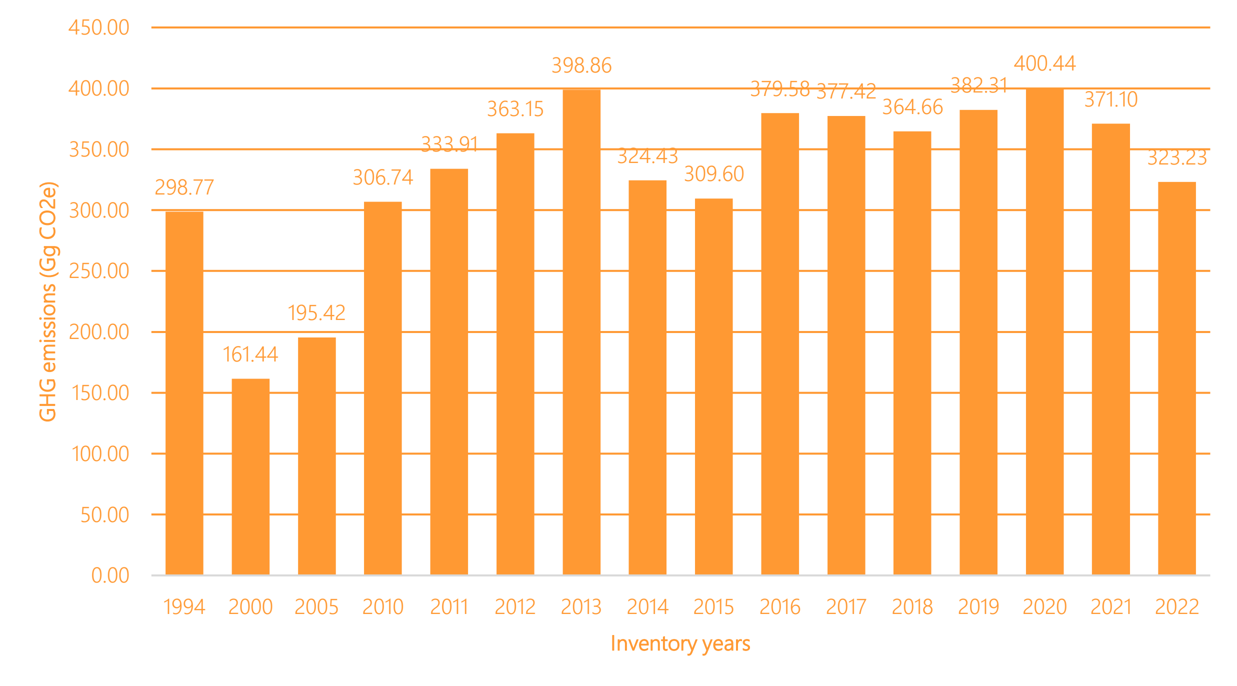
In 2022, the Energy sector emissions in Solomon Islands are mainly occurring due to the activities related to Fuel Combustion (category 1.A). The fuel combustion activities comprise of the following subcategories:

- 1.A.1. Energy Industries (20.37%)
- 1.A.3 Transport (76.32%)
- 1.A.4 Other sectors (Commercial/Institutional, Residential) (3.31%).

Following table 3.1 and figure 3.1 gives the relative distribution of GHG emissions across the energy sector for the time series 1994-2022.

Table 3.1: Energy Sector Emissions (in kt CO_2 eq): 1994-2022

Inventory years: 1994-2023	GHG emissions (kt CO_2 eq)							
Categories	1994	2000	2005	2010	2011	2012	2013	2014
1. Energy	298.77	161.44	195.42	306.74	333.91	363.15	398.86	324.43
1.A. Fuel combustion	298.77	161.44	195.42	306.74	333.91	363.15	398.86	324.43
1.A.1. Energy industries	53.85	44.98	48.53	59.69	75.03	76.48	74.48	67.96
1.A.3. Transport	196.12	91.12	115.60	187.94	250.05	277.85	313.75	247.20
1.A.4. Other sectors	48.80	25.34	31.29	59.11	8.83	8.83	10.63	9.27
Categories	2015	2016	2017	2018	2019	2020	2021	2022
1. Energy	309.60	379.58	377.42	364.66	382.31	400.44	371.10	323.23
1.A. Fuel combustion	309.60	379.58	377.42	364.66	382.31	400.44	371.10	323.23



3.2. Fuel combustion (CRT 1.A)

3.2.1 Category overview

In category 1.A Fuel Combustion Activities, emissions of CO_2, CH_4, N_2O, CO, NOx, NMVOCs, and SO_2 were estimated. Emissions were estimated for the following subcategories:

- 1.A.1 Energy Industries
- 1.A.3 Transport
- 1.A.4. Other Sectors

Solomon Islands is net importer of petroleum product. Emissions from fuel combustion activities are mainly due to combustion of liquid fuels (Diesel, Gasoline, Aviation Gasoline, Jet Kerosene, Kerosene, Residual fuel oil and Liquefied Petroleum Gas (LPG). The following table presents a summary of the total fuel consumption in the energy sector during the inventory years 1994-2022. Further, the methodologies for estimating emissions from fossil fuel combustion are described in this chapter.

Table 3.2: Fuel Consumption in Energy Sector- Fuel Combustion Activities: 2022

Fuel consumption	1994	2000	2005	2010	2011	2012	2013	2014
Units	Tonnes	Tonnes	Tonnes	Tonnes	Million Liters	Million Liters	Million Liters	Million Liters
Gas / Diesel Oil	70720	37091	42238	45417	112.246	114.439	111.145	101.605
Gasoline/Petrol	16300	11032	15760	35112	11.664	21.434	39.179	19.721
Lubricants	1890	891	1066	5955	0.394	0.383	0.569	0.396
Jet Kerosene	5920	27	33	7195	8.317	9.030	9.374	7.145
Residual Fuel Oil	–	1205	1545	1981	–	0.000021	0.0341	0.0168
Aviation Gasoline	–	–	–	–	0.084	0.096	0.144	0.048

Liquified Petroleum Gas (LPG) (tonnes)	940	339	654	1297	0.0015	0.0018	0.0019	0.0018
Fuel consumption Units	2015 Million Liters	2016 Million Liters	2017 Million Liters	2018 Million Liters	2019 Million Liters	2020 Million Liters	2021 Million Liters	2022 Million Liters
Gas / Diesel Oil	92.120	108.386	102.681	97.542	100.928	104.314	117.292	103.328
Gasoline/Petrol	24.300	36.226	41.940	42.857	46.496	55.327	12.701	15.745
Lubricants	0.3185	0.3171	0.4275	0.2332	0.6402	1.273	0.172	0.419
Jet Kerosene	6.001	6.626	6.097	5.350	10.568	2.759	2.172	3.637
Residual Fuel Oil	–	–	–	–	–	0.022	0.00012	0.0156
Aviation Gasoline	0.128	0.0800	0.0615	0.0540	–	–	23.776	8.639
Liquified Petroleum Gas (LPG) (tonnes)	2151	2055	1981	1996	1027	1597	2892	2943

CO_2 emissions from fuel combustion were also estimated using the Reference Approach, and the Reference and Sectoral approach for estimating CO_2 emissions from fuel combustion were compared (further Section 3.2.1).

3.2.2. Comparison of the sectoral approach with the reference approach

In accordance with the 2006 IPCC Guidelines (volume 2, chapter 6) (IPCC 2006), Solomon Islands estimates its CO_2 emissions from fuel combustion using a top-down approach independent of the sectoral approach. Under the reference approach, GHG emissions were estimated using only the fuel consumption data for each type of fuel. Whilst these two approaches are not expected to match each other, significant differences between the reference and sectoral approaches may indicate problems in inventory data.

The results of estimated CO_2 emissions for the GHG inventory year 1994-2022 using reference approach have been estimated and compared with the CO_2 emissions estimated using sectoral approach. The difference in estimates of CO_2 emissions from fuel combustion using the sectoral and reference approaches was within ±1% for all the recent years, data discrepancy may exist for historical data before 2010.

Table 2.3: Energy Sector CO_2 Emissions using Reference and Sectoral Approach: 1994-2022

	REFERENCE APPROACH			SECTORAL APPROACH		DIFFERENCE	
Inventory Year	Apparent energy consumption (PJ)	Apparent energy consumption (excluding non-energy use, reductants and feedstocks) (PJ)	CO_2 emissions (PJ)	Energy consumption (PJ)	CO_2 emissions (PJ)	Energy consumption (%)	CO_2 emissions (%)
1994	4.42	4.42	323.03	4.04	295.14	9.47	9.45
2000	2.28	2.28	163.91	2.19	159.54	4.36	2.74

2005	2.66	2.66	189.79	2.65	192.99	0.45	-1.66
2010	4.25	4.25	285.15	4.20	302.78	1.10	-5.82
2011	4.52	4.52	328.62	4.49	329.74	0.70	-0.34
2012	4.95	4.95	358.73	4.92	359.82	0.62	-0.30
2013	5.46	5.46	391.66	5.41	393.22	0.84	-0.40
2014	4.41	4.41	319.06	4.38	320.17	0.72	-0.35
2015	4.22	4.22	304.49	4.19	305.39	0.61	-0.30
2016	5.17	5.17	373.32	5.15	374.24	0.49	-0.25
2017	5.16	5.16	370.76	5.13	371.95	0.66	-0.32
2018	4.98	4.98	358.61	4.96	359.31	0.37	-0.19
2019	5.20	5.20	374.99	5.20	376.71	0.00	-0.46
2020	5.45	5.45	391.02	5.45	394.33	0.00	-0.84
2021	5.04	5.04	366.36	5.03	366.48	0.27	-0.03
2022	4.41	4.41	319.02	4.38	319.13	0.77	-0.03

32.3 International bunker fuels

The 2006 IPCC Guidelines require emissions from international aviation and marine bunkers to be reported separately to the national total emissions from the energy sector (IPCC 2006). They are instead reported as memo items (CRT table 1.D.1). Total CO_2 emissions from international aviation and international waterborne navigation for the year 2022 are estimated and presented in the following table 3.4 below, while emissions from other gases were insignificant. These emissions are not counted under national total GHG emissions. Activity data for both international marine and aviation bunkers are provided by the National Statistics office (SINSO).

Table 3.4: International Bunkers Fuel GHG Emissions (kt CO_2 eq): 2022

Inventory years: 1994-2023	GHG emissions (kt CO_2 eq)							
Categories	1994	2000	2005	2010	2011	2012	2013	2014
1.D.1. International bunkers	4.77	0.69	2.39	30.34	21.56	22.42	22.27	19.21
1.D.1.a. Aviation	4.77	0.69	2.39	30.34	6.46	7.01	7.31	5.53
1.D.1.b. Navigation	NO	NO	NO	NO	15.11	15.40	14.96	13.68
Categories	2015	2016	2017	2018	2019	2020	2021	2022
1.D.1. International bunkers	17.10	19.74	18.55	17.28	28.56	23.45	43.11	29.99
1.D.1.a. Aviation	4.71	5.15	4.73	4.15	8.13	2.12	18.19	8.80
1.D.1.b. Navigation	12.40	14.59	13.82	13.13	20.43	21.33	24.92	21.19

3.2.4 Feedstocks and non-energy use of fuels

This category includes excluded carbon, which includes both stored carbon and carbon used and emitted as CO_2 in other sectors. This inventory does not include emissions from Feedstocks and non-energy use of fuels due to lack of data.

3.2.4 Energy industries (CRT category 1.A.1)

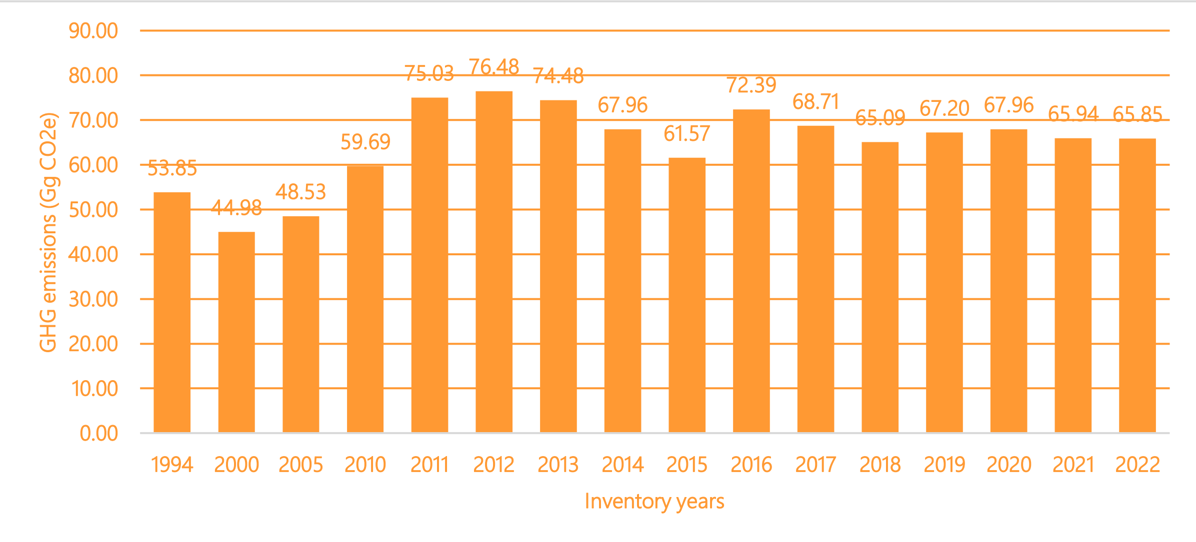
3.2.4.1 Category Description

This category includes emissions from fuel combustion for electricity generation.

Public electricity and heat production (CRT category 1.A.1.a)

In 2022, Electricity generation accounted for approximately 11% of the total national emissions excluding removals in 2022. It is the second most GHG emissions contributing source within the Energy sector and amounts to about 65.85 kt CO_2 eq viz 20.37% of the sectoral emission. Electricity generation is heavily reliant on Diesel oil. Solomon Islands Electricity Authority (SIEA) trading as Solomon Power (SP) is a State-Owned Enterprise and running the entire electricity power system from generation to distribution. Furthermore, as can be seen in the below figure, the emissions from the electricity generation activity have increased by 22% from 1994 to 2022.

Figure 3.2: Energy industries (Electricity generation) emissions (in kt CO_2 eq): 1994 - 2022



Furthermore, the below table 3.5 presents the Indirect GHG emissions of NOx, CO, NMVOC and SO_2 gas from the Electricity generation.

Table 3.5: Indirect GHG emissions from Energy Industries (electricity generation) in kt: 2022

Inventory years	NOx	CO	NMVOCs	SO_2
1994	0.05	0.01	0.00	0.03
2000	0.04	0.01	0.00	0.03
2005	0.04	0.01	0.00	0.03
2010	0.05	0.01	0.00	0.04
2011	0.07	0.02	0.00	0.05
2012	0.07	0.02	0.00	0.05
2013	0.06	0.02	0.00	0.05
2014	0.06	0.01	0.00	0.04
2015	0.05	0.01	0.00	0.04

2016	0.06	0.02	0.00	0.05
2017	0.06	0.01	0.00	0.04
2018	0.06	0.01	0.00	0.04

3.2.4.2. Methodological issues

The Tier 1 methodology of the 2006 IPCC Guidelines was used to estimate GHG emissions in Category 1.A. Energy Industries using default factors.

The estimates of greenhouse gas emissions from each type of fuel used for energy production was calculated using Equation 2.1 of the 2006 IPCC Guidelines, Vol. 2, Chapter 2, p. 2.11:

$$Emissions_{GHG} = \sum_{fuels} Emissions_{GHG,fuel} = \sum_{fuels} Fuel\ Consumption_{fuel} \times Emission\ Factor_{GHG,fuel}$$

Where:

$Emissions_{GHG,fuel}$= emissions of a given GHG by type of fuel (kg GHG)

$Fuel\ Consumption_{fuel}$ = amount of fuel combusted (TJ)

$Emission\ Factor_{GHG,fuel}$= default emission factor of a given GHG by type of fuel (kg gas/TJ).

Additionally, indirect GHG emissions NOx, CO, NMVOC and SO_2 are also estimated.

Equation 2.2 of the 2006 IPCC Guidelines, Vol. 2, Chapter 2, page 2.11 was used to calculate total GHG emissions for all fuel types used:

$$Emissions_{GHG} = \sum_{fuels} Emissions_{GHG,fuel}$$

Activity data

The activity data was provided by SIEA and is presented in the table below:

Table 3.6: Fuel consumption data used for estimating GHG emissions from electricity generation

Inventory years	Gas/Diesel Oil	Lubricating Oil	Units
1994	16680.00	–	Tonnes
2000	14008.58	66.89	Tonnes
2005	15112.24	74.07	Tonnes
2010	18599.51	78.89	Tonnes
2011	28061542.72	157758.56	Liters
2012	28609914.09	153406.89	Liters
2013	27786493.81	227991.64	Liters
2014	25401295.50	158763.41	Liters
2015	23030034.54	127405.80	Liters
2016	27096594.40	126846.58	Liters
2017	25670337.47	171029.09	Liters

2018	24385642.59	93283.92	Liters
2019	25023832.38	256101.06	Liters
2020	25071281.36	509408.72	Liters
2021	24728478.00	68814.41	Liters
2022	24601524.00	167937.51	Liters

Emission Factor

The emission estimates are computed using the IPCC default emission factors tabulated in the table below:

Table 3.7: Emission Factors used for estimating GHG emissions from electricity generation

Emission factor for Fuel	CO_2 (kg CO2/TJ)	CH_4 (kg CH_4/TJ)	N_2O (kg N_2O/TJ)
Diesel	74,100	3	0.6
Lubricants	73,300	3	0.6

The EMEP / EEA Guidebook (2023) default Tier 1 EFs has been used for estimating these emissions.

Table 3.8: Emission Factors used for estimating indirect GHG emissions from electricity generation

Emission factor for Fuel	NOx (g/GJ)	CO (g/GJ)	NMVOC (g/GJ)	SO_2 (g/GJ)
Diesel	65	16.2	0.8	46.5

3.2.4.3. Description of any Flexibility Applied

No flexibility is applied for this category.

3.2.4.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

3.2.4.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

3.2.4.6. Category-specific recalculations

There are no recalculations for this category.

3.2.4.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

3.2.5 Transport

3.2.5.1 Category description

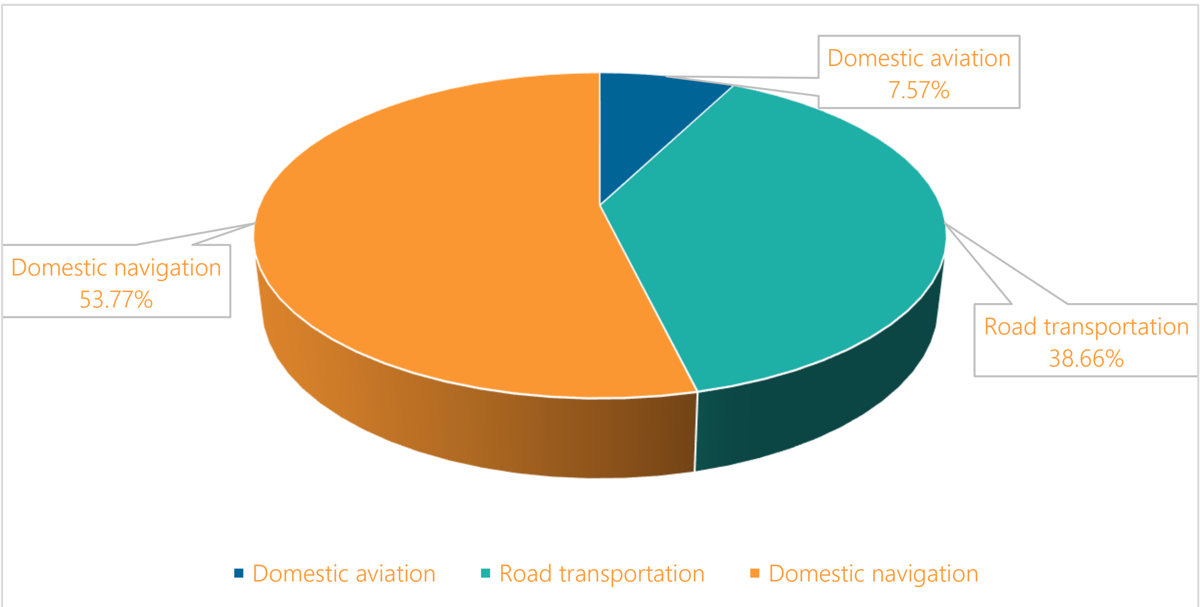
The transport sector is a predominant fossil fuel consuming sector in Solomon Islands. In 2022, the GHG emissions from Transport sector were 246.68 kt CO_2 eq, which is about 76% of the emissions within Energy sector and 40% of the total national GHG emissions (excluding removals). The transport sector includes inland road transport, domestic aviation and domestic waterborne navigation; international aviation and international waterborne navigation included as memo items and are included in the total national GHG emissions.

Within the transport sector, domestic waterborne navigation is the largest fuel consumer and GHG emitting source. It contributes about 53.77% of the total GHG emissions within the transport sector. It is followed by the road transport sector which accounted for 38.66% and civil aviation (7.57%) of the total GHG emissions from the transport sector respectively.

Table 3.9: Transport sector GHG emissions (kt): 2022

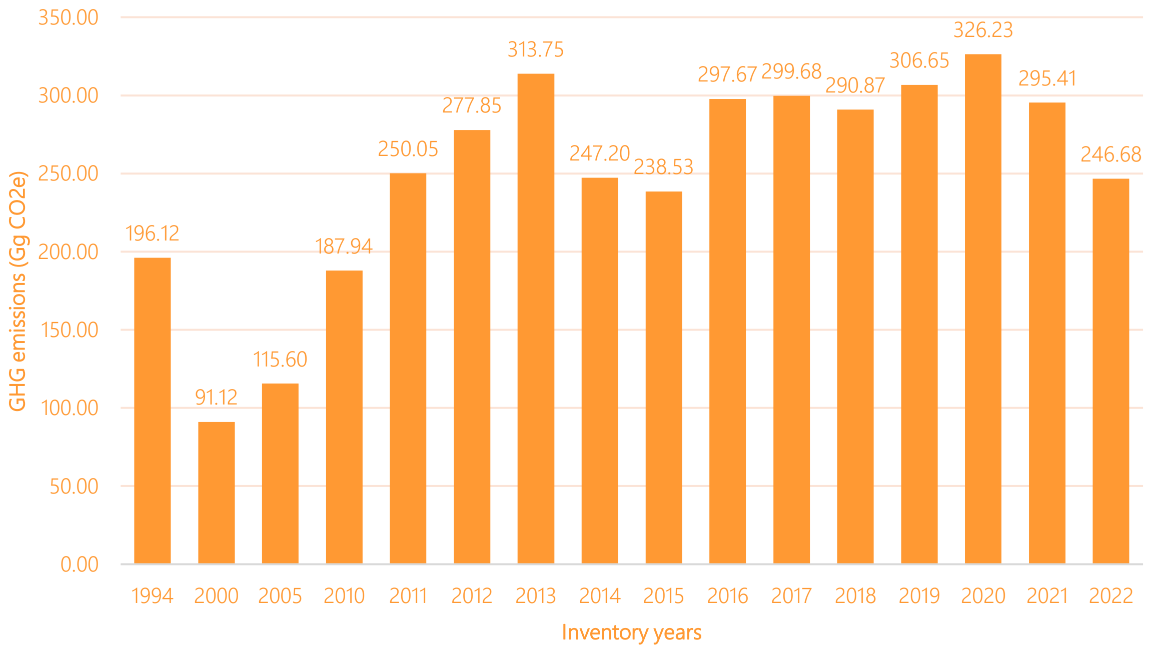
	kt CO_2	kt CH_4	kt N_2O	kt CO_2 eq
Domestic aviation	18.52	0.0001	0.001	18.67
Road transportation	93.69	0.0050	0.006	95.36
Domestic navigation	130.60	0.0069	0.007	132.65
Total	242.81	0.0120	0.0134	246.68

Figure 3.2: Transport Sector GHG emissions: 2022



As can be seen in the figure 3.3 below, the transport sector emissions have increased by 26% from 1994 to 2022.

Figure 3.3: Total Transport Sector GHG emissions (kt CO_2 eq): 1994-2022



The fuel types that are used in the road transport sectors are. petrol (gasoline), diesel and lubricants in 2-stroke engines.

For the Aviation sector, it is comprising domestic and international aviation, segregated Aviation Gasoline and Jet Kerosene consumption data for both the sectors were obtained. The emission estimates made for the combustion of Aviation Gasoline and Jet Kerosene in international aviation are reported separately as a memo item under international bunkers.

The water-borne navigation sector emission estimates are based on fuel consumption (Gas / Diesel Oil, Jet kerosene) segregated across national and international maritime fleets. Emissions estimates made for international fleets are reported as memo items under marine bunkers separately.

Table 3.10 presents the indirect gas (NOx, CO, NMVOC and SO_2) emissions from the transport sector.

Table 3.10: Transport sector indirect gas emissions (NOx, CO, NMVOC and SO_2) emissions (kt): 1994-2022

Inventory Year: 1994-2022	Net Indirect Emissions (kt)			
	NOx	CO	NMVOCs	SO_2

1994	0.77	1.43	0.18	0.04
2000	0.45	1.03	0.17	0.06
2005	0.55	1.45	0.37	0.07
2010	0.82	3.12	0.57	0.11
2011	3.41	1.75	0.44	0.77
2012	3.54	2.9	0.7	0.81
2013	3.56	4.97	1.17	0.83
2014	3.14	2.66	0.64	0.72
2015	2.89	3.16	0.75	0.67
2016	3.45	4.61	1.09	0.8
2017	3.32	5.26	1.23	0.78
2018	3.17	5.35	1.25	0.74
2019	3.57	5.81	1.36	0.86
2020	3.74	6.84	1.59	0.91
2021	4.16	1.97	0.51	0.95
2022	3.51	2.23	0.55	0.82

3.2.5.2 Methodological issues

The estimation of emissions from this category was also carried out using Tier 1 method, as outlined in 2006 IPCC guidelines. The Tier 1 approach calculates CO_2 emissions by multiplying estimated fuel sold/consumed with a default CO_2 emission factor.

The estimates of CO_2 emissions from each type of fuel used for transport were calculated using Equation 3.2.1 of the 2006 IPCC Guidelines, Vol. 2, Chapter 3, p. 3.12:

$$Emission = \sum_a Fuel\ Consumption_a \times Emission\ Factor_a$$

Where:

Emissions = emission in kg

EF_a = emission factor (kg/TJ)

$Fuel_a$ = fuel consumed, (TJ) (as represented by fuel sold)

a = fuel type a (e.g., diesel, gasoline, Aviation Gasoline, etc.)

For estimating CH_4 AND N_2O emissions for Tier 1 method for was calculated using equation 3.2.3 of the 2006 IPCC Guidelines, Vol. 2, Chapter 3, p. 3.13:

$$Emission = \sum_{a,b,c} Fuel\ Consumption_{a,b,c} \times Emission\ Factor_{a,b,c}$$

Since the IPCC guidelines do not provide EFs for indirect GHGs such as NOx, CO, NMVOCs and SO_2, the EMEP / EEA Guidebook (2023) default Tier 1 EFs has been used for estimating these emissions.

Activity data

In the absence of sectoral fuel consumption data, the following assumptions were made to arrive at the fuel distribution in transport sector for the inventory period 2011-2022. Whereas the fuel consumption for the years 1994, 2000, 2005 and 2010 reported in the previous national communications and are also presented here.

Diesel oil:

Data on diesel consumption for electricity generation was provided by Solomon Power for the years 2021 and 2022. After subtracting the total quantity of fuel used for electricity generation from the total quantity of diesel imported in the country, the remaining fuel quantities are allocated to the transportation subsector in the following proportions:

- 30% of the total diesel imports are used for road transportation
- 60% of the total diesel imports are used for sea transportation i.e., domestic navigation
- And the remaining 10% is used for international marine Bunkering

Gasoline/ Petrol:

- 85% of the total petrol import is used for road transportation
- 15% of the total petrol is used for sea transportation i.e., domestic navigation

Jet Kerosene (DPK):

Dual purpose kerosene is mainly used for aviation fuel but also for cooking and lighting. To this end, it is assumed that 50% of the total DPK import is used for domestic aviation. 30% is used for international aviation bunkering and remaining 10% each is used in Commercial, Institutional and Residential buildings respectively.

Lubricating Oil:

It is assumed that 30% of the total Lubricant oils is assumed to be towards Energy Sector whilst, the remaining (70%) is used in IPPU sector.

Of this 30% of import quantities, 60% is assumed to be used in road transportation and the remaining 40% in electricity generation.

Aviation Gasoline:

- 70% of the Aviation Gasoline imported is used in domestic aviation and
- The remaining 30% is used for international aviation bunkers.

Residual Fuel oil:

All quantities used in Other sector- Commercial and Institutional buildings

LPG:

- 35% of the total LPG imports are used in Commercial and Institutional buildings and
- remaining 65% is used in Residential buildings

The total fuel consumption from 1994-2022 from the transport sector is presented in the table below(unit for all fuels is in Liters unless specified differently):

Table 3.11: Total Fuel Consumption in Transport Sector: 1994-2022

Sub-category	1.A.3.a Domestic Aviation		1.A.3.b Road Transportation			1.A.3.d Domestic Navigation	
Fuel consumption	Aviation Gasoline (AVG)	Jet Kerosene (DPK)	Gas/Diesel Oil	Gasoline/Petrol	Lubricating Oil	Gas/Diesel Oil	Gasoline/Petrol
1994	–	–	–	–	–	–	–
2000	–	–	16700 (tonnes)	11032 (tonnes)	824 (tonnes)	–	–
2005	–	–	19523 (tonnes)	15760 (tonnes)	991 (tonnes)	–	–
2010	–	–	18643 (tonnes)	35112 (tonnes)	5876 (tonnes)	–	–
2011	58810	4158729	33673851	9914877	236638	44898468	1749684
2012	67200	4515179	34331897	18218911	230110	45775863	3215102
2013	100800	4687274	33343793	33302309	341987	44458390	5876878
2014	33600	3572792	30481555	16763640	238145	40642073	2958289
2015	89600	3000974	27636041	20655079	191109	36848055	3645014
2016	56000	3313060	32515913	30792771	190270	43354551	5434018
2017	43113	3048696	30804405	35649840	256544	41072540	6291148
2018	37830	2675154	29262771	36428972	139926	39017028	6428642
2019	–	5284408	22771384	39521998	384152	45542768	6974470
2020	0	1379839	23772912	47028713	764113	47545824	8299185
2021	16643861	1086472	27769184	10796337	103222	55538369	1905236
2022	6047312	1818845	23618014	13383697	251906	47236028	2361829

Emission Factor

The default emission factors used for estimating emissions from the fuels consumed for transportation are provided below in the table

Table 3.12: Emission Factors used for estimating GHG emissions from Transportation

Emission factor for Fuel	CO_2 (kg CO_2/TJ)	CH_4 (kg CH_4/TJ)	N_2O (kg N_2O/TJ)
Gasoline	69300	3.8	5.7
Diesel	74100	3.9	3.9
Jet Kerosene	71500	0.5	2
Aviation Gasoline	70000	0.5	2
Lubricants	73300	3	0.6

The EMEP / EEA Guidebook (2023) default Tier 1 EFs has been used for estimating indirect GHGs from Transportation Sub-sector are tabulated in the table.

Table 3.13: Emission Factors used for estimating indirect GHG emissions from Transportation

Emission factor for Fuel	NOx	CO	NMVOC	Units
Gas / Diesel Oil	12.96	3.33	0.7	g/kg
Gasoline/Petrol	8.73	84.7	10.05	g/kg
Aviation Gasoline	250	100	50	kg/TJ
Jet Kerosene	250	100	50	kg/TJ

3.2.5.3. Description of any Flexibility Applied

No flexibility is applied for this category.

3.2.5.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

3.2.5.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

3.2.5.6. Category-specific recalculations

There are no recalculations for this category.

3.2.5.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

3.2.6 Other Sectors

3.2.6.1 Category description

Source category 1.A.4 other sectors is an aggregation of the Commercial/Institutional and Residential sources:

In Solomon Islands, the others sub-sector of energy sector includes direct fuel consumption mainly in commercial, institutional, residential and any other uncategorized and unorganized sector or purposes; this includes hotels, tourism bungalow, guest houses, restaurants, retail, shopping complexes etc. The major fuels consumed in the residential sector are firewood and LPG. LPG consumption is expected to marginally increase due to awareness, affordability and access to modern cooking fuel for residential sector. However, some quantities of Residual Fuel oil are also used for heating applications in commercial/ Institutional buildings. This excludes the GHG emissions due to the use of electricity which has been reported under 1A1a. The major fuels consumed in residential sector are firewood, LPG and kerosene/dual purpose kerosene (Jet kerosene).

In 2022, the Other sectors emitted 10.70 kt of CO_2 eq, which is about 3.31% of total sectoral emission and 1.7% of total national GHG emissions (excluding removals). The biomass consumption in the residential sector (mainly from cooking) is mostly renewable biomass, collected from the forest land, in the absence of data emission form the biomass combustion not included in the national inventory report. Furthermore, as can be seen in figure 3.4 below, the emissions from the Other sectors have decreased by 78% from the base year 1994 to 2022.

Figure 3.4: Total Other Sector GHG emissions (kt CO_2 eq): 1994-2022

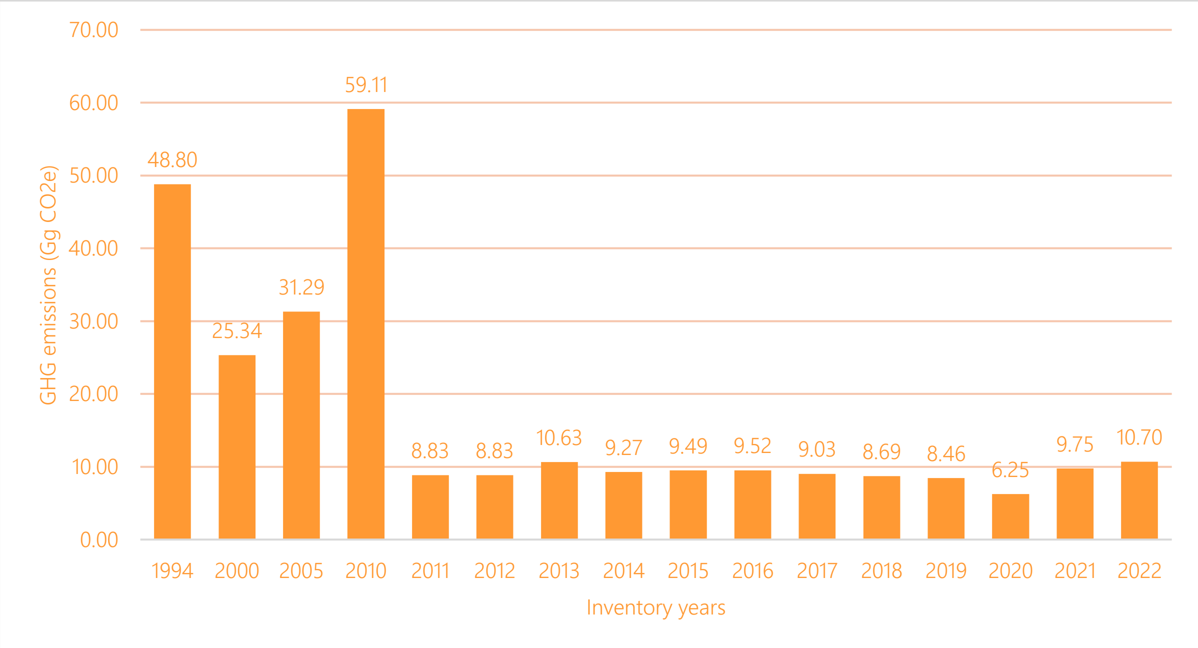


Table 3.14: Other sector indirect gas emissions (NOx, CO, NMVOC and SO_2) emissions (kt): 1994-2022

Inventory Year: 1994-2022	Net Indirect Emissions (kt)			
	NOx	CO	NMVOCs	SO_2
1994	0.152	0.053	0.010	0.054
2000	0.100	0.031	0.007	0.030
2005	0.121	0.037	0.008	0.037
2010	0.216	0.069	0.014	0.069
2011	0.002	0.001	0.000	0.000
2012	0.003	0.002	0.000	0.000
2013	0.003	0.002	0.000	0.000
2014	0.003	0.001	0.000	0.000
2015	0.003	0.002	0.000	0.000
2016	0.003	0.002	0.000	0.000
2017	0.002	0.002	0.000	0.000

2018	0.003	0.002	0.000	0.000
2019	0.022	0.009	0.004	0.000
2020	0.010	0.004	0.002	0.000
2021	0.012	0.005	0.002	0.000
2022	0.015	0.006	0.003	0.000

3.2.6.2 Methodological issues

For this category, the Tier 1 methodology of the 2006 IPCC Guidelines was used. The estimates of greenhouse gas emissions from each type of fuel used for manufacturing industries and construction were calculated using Equation 2.1 of the 2006 IPCC Guidelines, Vol. 2, Chapter 2, p. 2.11:

$$Emissions_{GHG} = \sum_{fuels} Emissions_{GHG,fuel} = \sum_{fuels} Fuel\ Consumption_{fuel} \times Emission\ Factor_{GHG,fuel}$$

Where:

$Emissions_{GHG,fuel}$= emissions of a given GHG by type of fuel (kg GHG)

$Fuel\ Consumption_{fuel}$ = amount of fuel combusted (TJ)

$Emission\ Factor_{GHG,fuel}$= default emission factor of a given GHG by type of fuel (kg gas/TJ).

Equation 2.2 of the 2006 IPCC Guidelines, Vol. 2, Chapter 2, page 2.11 was used to calculate total GHG emissions for all fuel types used:

$$Emissions_{GHG} = \sum_{fuels} Emissions_{GHG,fuel}$$

Since the IPCC guidelines do not provide EFs for indirect GHGs such as NOx, CO, NMVOCs and SO_2, but proposes the use of EMEP / EEA Guidebook (2023) default Tier 1 EFs for estimating these emissions.

Activity data

The total LPG imported is assumed to be distributed 35% for commercial/institutional use and remaining 65% for residential purpose. The total fuel consumption and emissions from the other sector during the inventory year 2022 are as follows:

Table 3.15: Total Fuel Consumption in Other- Commercial, Institutional and Residential Sector: 1994-2022

Sub-category	Commercial/Institutional				Residential	
Fuel consumption	Gas/Diesel Oil (Liters)	Jet Kerosene (Liters)	Residual Fuel Oil (Liters)	Liquefied Petroleum Gas (LPG) (Tonnes)	Jet Kerosene (Liters	Liquefied Petroleum Gas (LPG) (Tonnes)
1994	–	–	–	330	3620	610

2000	6383 (Tonnes)	22 (Tonnes)	1205 (Tonnes)	170	5 (Tonnes)	169
2005	7603 (Tonnes)	27 (Tonnes)	1545 (Tonnes)	328	7 (Tonnes)	327
2010	8175 (Tonnes)	5757 (Tonnes)	1981 (Tonnes)	650	143 (Tonnes)9	647
2011	–	831746	–	537	831746	996
2012	–	903036	21	663	903036	1231
2013	–	937455	34129	671	937455	1245
2014	–	714558	16854	653	714558	1212
2015	–	600195	–	753	600195	1398
2016	–	662612	–	719	662612	1336
2017	–	609739	–	693	609739	1288
2018	–	535031	–	699	535031	1297
2019	–	1056882	–	359	1056882	667
2020	–	275968	22588	559	275968	1038
2021	–	217294	123	1012	217294	1880
2022	–	363769	15618	1030	363769	1913

Emission Factor

The default emission factor of fuels used in Other sector is provided in the table below

Table 3.16: Emission Factors used for estimating GHG emissions from Other Sector- Commercial, Institutional and Residential

Emission factor for Fuel	CO_2 (kg CO_2/TJ)	CH_4 (kg CO_2/TJ)	N_2O (kg CO_2/TJ)
Liquefied Petroleum Gas (LPG)	63100	1	1
Gas/Diesel Oil	74100	3	0.6
Jet Kerosene	77400	10	0.6
Residual fuel oil	71500	3	0.6

The EMEP / EEA Guidebook (2023) default Tier 1 EFs has been used for estimating indirect GHGs from Transportation Sub-sector are tabulated in the table.

Table 3.17: Emission Factors used for estimating indirect GHG emissions from Other Sector- Commercial, Institutional and Residential

Emission factor for Fuel	NOx (g/GJ)	CO (g/GJ)	NMVOC (g/GJ)	SO_2 (g/GJ)
Liquefied Petroleum Gas (LPG)	74	29	23	0.67

Gas/Diesel Oil	65	16.2	0.8	46.5
Jet Kerosene	250	100	50	0
Residual Fuel Oil	306	93	20	94

3.2.6.3. Description of any Flexibility Applied

No flexibility is applied for this category.

3.2.6.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

3.2.6.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

3.2.6.6. Category-specific recalculations

There are no recalculations for this category.

3.2.6.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

Chapter 4: Industrial processes and product use (CRT sector 2)

4.1 Overview of the sector

Under the Industrial Processes and Product Use (IPPU), the GHG emissions occurring from the following categories are estimated in this inventory

- 2D Non-energy products from fuels and solvent use
- 2F Product uses as substitutes for ODS

Furthermore, the main industries of Solomon Islands include fisheries, forestry and mining, with most manufactured produce being food, beverages, tobacco and wood products. However, due to limited data availability. Solomon Islands does not produce any ODS however small quantum of these (mainly HFC) gets imported in the country as refrigerants in air conditioners and refrigerators.

The total GHG emissions from this sector is of small quantum i.e., 0.49 kt CO_2 eq in 2022. The main GHG contributing category is non-energy products from fuels and solvent use (almost 100%). While the contribution of Product uses as substitutes for ODS (mainly HFC consumption is minuscule (0.00152 kt CO_2 eq).

4.2. Non-energy products from fuels and solvent use (CRT category 2.D)

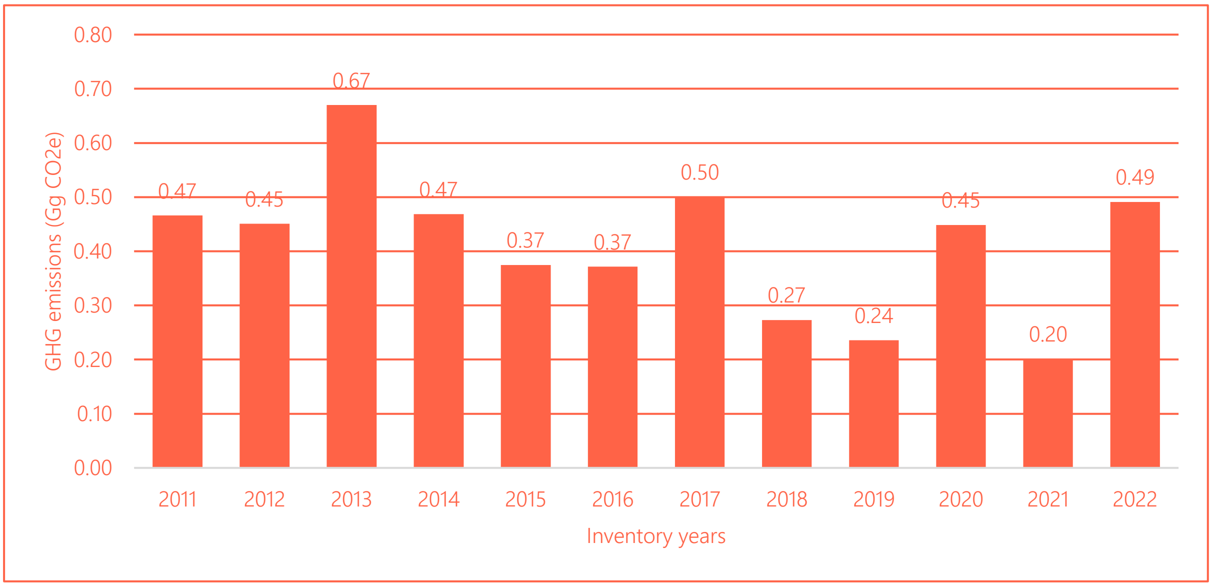
4.2.1 Category description

Lubricant Use (2.D.1)

Some CO_2 emissions from fossil fuels arise from uses that are not primarily for energy purposes but are used for so-called 'non-energy' purposes. The emissions from such non-energy use of fossil fuel that are not accounted under any of the other categories under IPPU are accounted under the category 'Non-Energy Products from Fuels and Solvent Use'. The examples of non-energy products are Lubricants and greases are used in engines for their lubricating properties; paraffin waxes are used as candles, for paper coating etc.; bitumen on roofs and roads for its waterproofing and wear qualities.

The emissions from this sub-category were 0.49 kt CO_2 eq in 2022.

Figure 4.1: Total GHG emissions from Lubricant Use (GHG emissions (kt CO_2 eq): 1994-2022



4.2.2 Methodological issues

The emissions from this category were estimated using the Tier 1 methodology and equation 5.2 (pp. 5.7, Vol 3. Chapter 5 of the 2006 IPCC guidelines. The estimation of emission is computed using the equation as shown below.

$$CO2\ Emissions\ = \sum_i LC_i \times CC_i \times ODU_i \times \frac{44}{12}$$

Where:

CO_2 Emissions = CO_2 emissions from lubricants, tonne CO_2

LC_i = Consumption of lubricants or grease, TJ

CC_i= carbon content of lubricants (default), tonne C/TJ (= kg C/GJ)

ODU_i= ODU factor (based on default composition of oil and grease), fraction (0.2 for Lubricating Oils and 0.05 for Grease)

44/12 = mass ratio of CO_2/C

Activity data

As discussed briefly in previous sections, the estimated quantity of Lubricants (lubricating oil) used in the year 2022 was 9,79,635 Liters.

Table 4.1: Activity data for estimating GHG emissions from this category from 2011-2022

Lubricants consumption	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Units
Lubricating Oil	920258	894874	1329951	926120	743201	739938	997670	544156	448177	891465	401417	979635	Liters
Grease	32232	14714	22089	30505	14678	4540	6250	2757	73328	13136	–	–	Kg

Emission factor

The 2006 IPCC Guidelines default value for carbon content (20 tonne carbon/TJ) and ODU is used. Additionally, the default values for the net calorific value (40.2 TJ/kt) are also used for converting the mass value of activity data into energy units.

4.1.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

4.1.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

4.1.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

4.1.6. Category-specific recalculations

There are no recalculations for this category.

4.1.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

4.3 Product uses as substitutes for ODS (CRT category 2.F)

4.2.1 Category description

2.F.1. Refrigeration and air conditioning

There is no HFCs production in the country, storage and destruction data are also not available. In 2.F Product Uses as Substitutes for Ozone Depleting Substances category, hydrofluorocarbons (HFCs) emissions are estimated only for 2.F.1 Refrigeration and Air Conditioning category without disaggregation into stationary and mobile air conditioning due to lack of data. The emissions from this category were

4.2.2 Methodological issues

HFC emissions in the category were estimated in accordance with the 2006 IPCC Guidelines, Tier 1a.

The estimation of HFC emissions was based on the following assumptions:

- It is assumed that 50% of the HFCs imported are in store and not consumed.
- The remaining 50% is in the equipment and 10% of it is annual leakages which are contributing to GHG emissions.

Based on these assumptions, the amount of individual HFCs for each year was calculated.

Emissions for each HFC from imported blends were calculated according to the following equations:

Current year bank (tonnes) = HFC imported (tonnes) – 50% HFC stored in equipment's (tonnes) – HFC in equipment's

*Current year HFC emissions = Current year bank (thousand tons) * 0.10*

The results were multiplied by the respective GWPs for each of the HFCs and then summed to account for total GHG emissions from this sub-category.

Activity data

Based on the above discussion, the estimated quantity of the HFCs is presented in the table below:

Table 4.2: HFCs consumption for years 2016–2022

Inventory year	**2016**	**2017**	**2018**	**2019**
Substance	**HFC-22**	**HFC-22**	**HFC-22**	**HFC-22**
Import	2.17	4.2	3.63	1.49
Store (in shelf)	1.085	2.1	1.815	0.745
In Equipment's	1.085	2.1	1.815	0.745
Annual leakage from equipment (kg)	0.1085	0.21	0.1815	0.0745
Annual leakage from equipment (tonnes)	0.0001085	0.00021	0.0001815	0.0000745
Constituent	–	–	–	–
% Composition	–	–	–	–

Inventory year	2020					
Substance	HFC-22	HFC-32	HFC-134a	R-404A	R-407C	R-410A
Import	1.468	0.88	7.55	0.46	0.3	5.26
Store (in shelf)	0.734	0.44	3.775	0.23	0.15	2.63

In Equipment's	0.734	0.44	3.775	0.23	0.15	2.63
Annual leakage from equipment (kg)	0.0734	0.044	0.3775	0.023	0.015	0.263
Annual leakage from equipment (tonnes)	0.0000734	0.000044	0.0003775	0.000023	0.000015	0.000263
Constituent	–	–	–	HFC-125=44%; HFC-134a=4%; HFC-143a=52%	HFC-32=23%; HFC-125=25%; HFC-134a=52%	HFC-32=50%; HFC-125=50%
% Composition	–	–	–	44/4/52	23/25/52	50/50

Inventory year				2021			
Substance	HFC-22	HFC-32	HFC-134a	R-404A	R-407C	R-410A	R-507A
Import	1.41	0.88	8.03	0.33	0.3	5.83	0.507
Store (in shelf)	0.705	0.44	4.015	0.165	0.15	2.915	0.2535
In Equipment's	0.705	0.44	4.015	0.165	0.15	2.915	0.2535
Annual leakage from equipment (kg)	0.0705	0.044	0.4015	0.0165	0.015	0.2915	0.02535
Annual leakage from equipment (tonnes)	0.0000705	0.000044	0.0004015	0.0000165	0.000015	0.0002915	0.00002535
Constituent				HFC-125=44%; HFC-134a=4%; HFC-143a=52%	HFC-32=23%; HFC-125=25%; HFC-134a=52%	HFC-32=50%; HFC-125=50%	HFC-125=50%; HFC-143a=50%
% Composition				44/4/52	23/25/52	50/50	50/50

Inventory year				2022			
Substance	HFC-22	HFC-32	HFC-134a	R-404A	R-407C	R-410A	R-507A
Import (kg)	1.68	1.24	9.34	0.54	0.29	5.75	0.2
Store (in shelf) (kg)	0.84	0.62	4.67	0.27	0.145	2.875	0.1
In Equipment's (kg)	0.84	0.62	4.67	0.27	0.145	2.875	0.1
Annual leakage from equipment (kg)	0.084	0.062	0.467	0.027	0.0145	0.2875	0.01
Annual leakage from equipment (tonnes)	0.000084	0.000062	0.000467	0.000027	0.0000145	0.0002875	0.00001
Constituent				HFC-125=44%; HFC-134a=4%; HFC-143a=52%	HFC-32=23%; HFC-125=25%; HFC-134a=52%	HFC-32=50%; HFC-125=50%	HFC-125=50%; HFC-143a=50%
% Composition				44/4/52	23/25/52	50/50	50/50

Emission factors

The following table presents the GWP values used for estimating the GHG emissions:

Table 4.3: GWP values for HFCs

GWP Values (100- years)- IPCC AR5	
HFC-22	1760
HFC-32 (R-32)	677

HFC-134a (R-134a)	1300
R-404A	3943
R-407C	1624
R-410A	1924
R-507A	3985
HFC-125	3170
HFC-134a (R-134a)	1300
HFC-143a	4800

4.2.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

4.2.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

4.2.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

4.2.6. Category-specific recalculations

There are no recalculations for this category.

4.2.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

Chapter 5: Agriculture (CRT sector 3)

5.1 Overview of the sector

In Solomon Islands, the agriculture sector is including emissions from following sub-sectors

- 3.A. Enteric Fermentation
- 3.B. Manure Management
- 3.D. Agricultural soils
- 3.H. Urea application

The agriculture sector is the second largest GHG emission sector in Solomon Islands and also the largest source of CH_4 and N_2O. Urea application to soil also leads to CO_2 emissions. In 2022, the agriculture sector emissions were 198.74 kt CO_2 eq which is about 34.45% of the total national GHG emissions (excluding removals). Of these CH_4 and N_2O and CO_2 emissions were 83.39%, 15.65% and 0.96% respectively. Methane (CH_4) emissions occur from this sector due to livestock rearing (enteric fermentation and manure management). N_2O is mainly emitted (direct and indirect) from manure management and managed soils.

In 2022, Manure management was the main source of Agriculture emissions, contributing around 90% of the sector's emissions, followed by Enteric fermentation (5.6%), Agricultural soils (3.4%) and remaining <1% from Urea application respectively. Moreover, the GHG emissions from agriculture sector have increased during the period 2000-2022 because of the increase in population of livestock (Emissions from this sector were not estimated for base year 1994. Hence, information on emissions is not available for 1994). The emissions have increased by 198.65% from 2000-2022. The GHG emissions from sub-sectors of the agriculture sector are illustrated in the following table 5.1, figure 5.1 and 5.2.

Table 5.1: Agriculture sector GHG Emissions (kt CO_2 eq): 1994:2022

Inventory years: 1994-2022	GHG emissions (kt CO_2 eq)							
Categories	2000	2005	2010	2011	2012	2013	2014	2015
3. Agriculture	66.55	69.97	72.94	146.89	150.75	154.93	158.80	164.58
3.A. Enteric fermentation	23.24	24.16	24.85	8.63	8.86	9.09	9.32	9.54
3.B. Manure management	43.31	45.81	48.09	138.12	141.77	145.43	149.07	152.72
3.D. Agricultural soils	NO	NO	NO	0.10	0.12	0.41	0.41	1.80
3.H. Urea application	NO	NO	NO	0.03	0.00	0.00	0.00	0.51
Categories	2016	2017	2018	2019	2020	2021	2022	
3. Agriculture	171.55	173.48	178.98	186.66	187.95	193.30	198.74	
3.A. Enteric fermentation	9.77	10.01	10.24	10.47	10.71	10.94	11.18	
3.B. Manure management	156.39	160.09	163.83	167.58	171.35	175.09	178.91	
3.D. Agricultural soils	4.18	2.62	3.82	6.68	4.64	5.68	6.74	
3.H. Urea application	1.21	0.76	1.09	1.93	1.25	1.59	1.91	

Figure 5.1: Agriculture sector GHG emissions: 2022

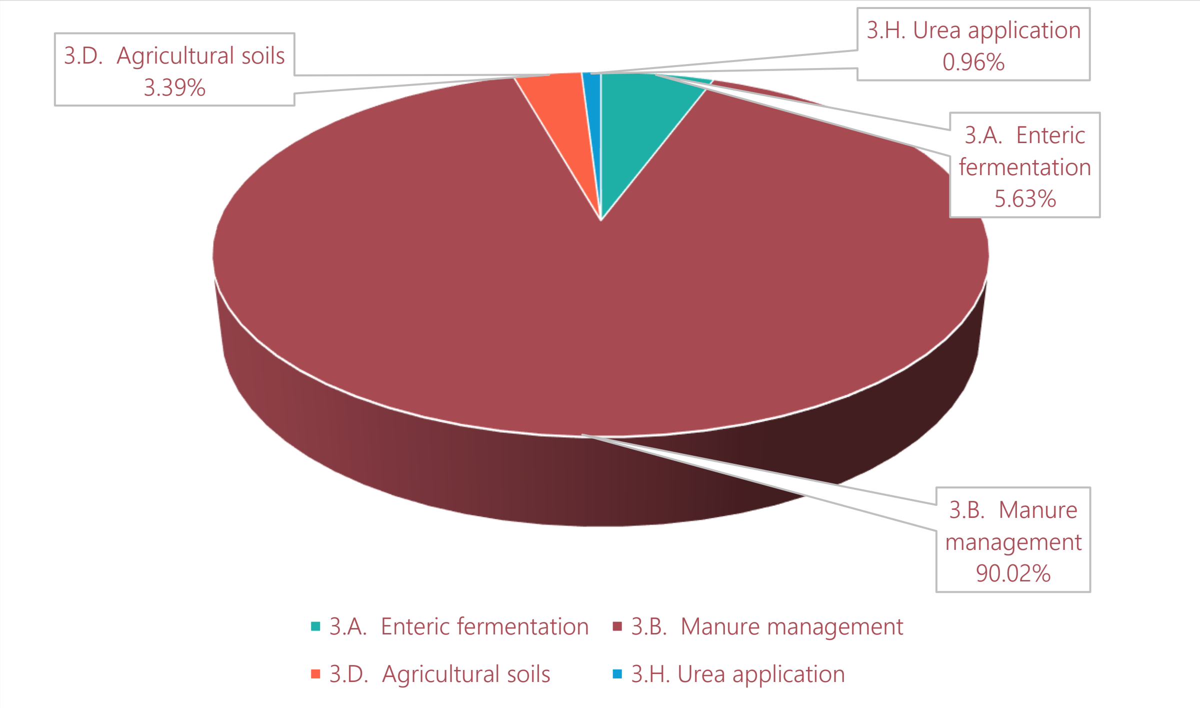
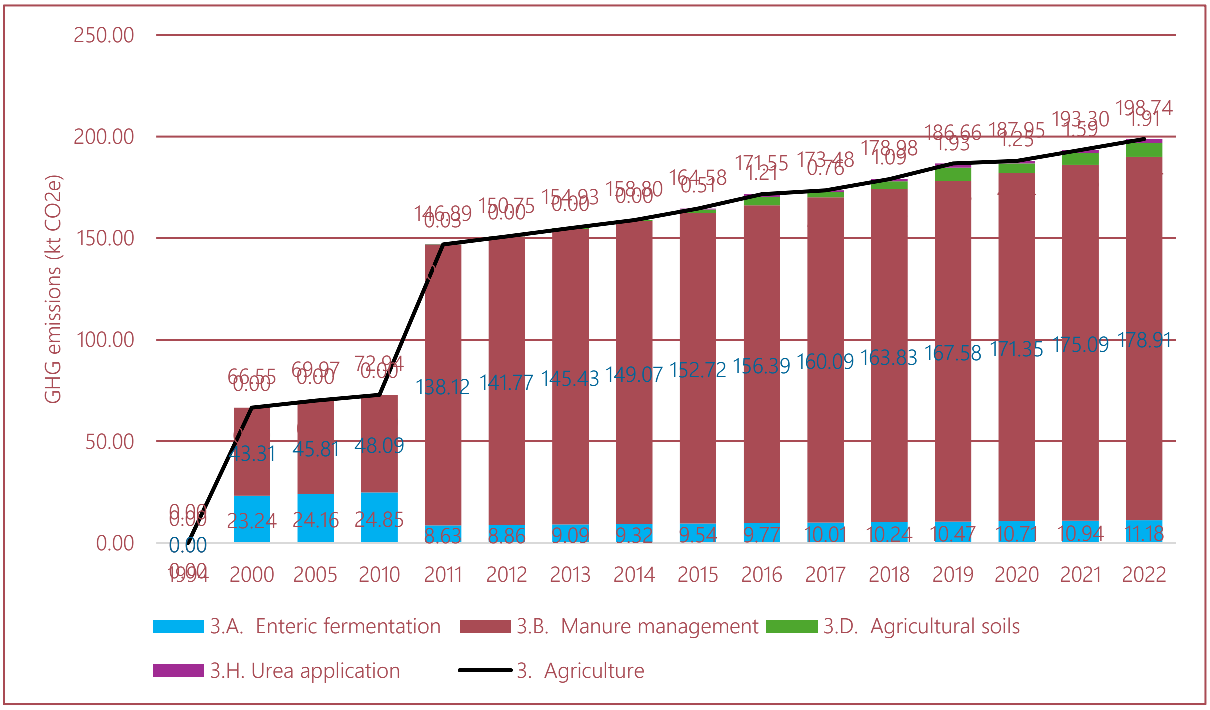


Figure 5.2: Agriculture sector GHG emissions (kt CO_2 eq): 2000-2022



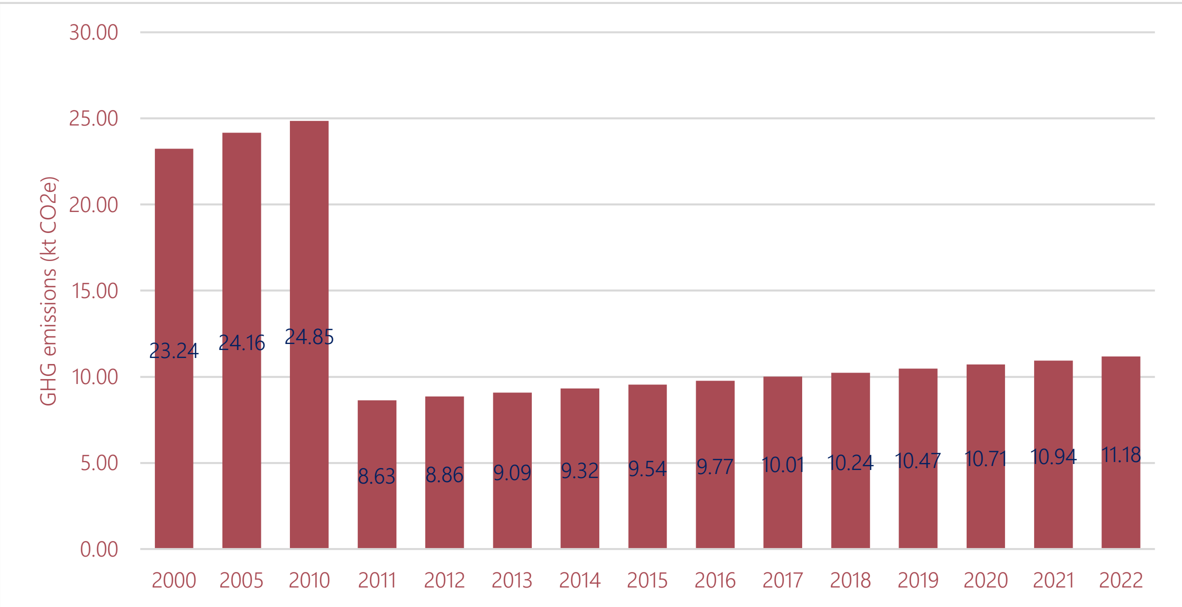
5.2 Enteric Fermentation (CRT category 3.A)

5.2.1 Category description

Methane is produced by herbivores as a by-product of enteric fermentation, a digestive process by which plant material consumed by an animal is broken down by bacteria in the gut under anaerobic conditions. A portion of the plant material is fermented in the rumen to simple fatty acids, CO_2 and CH_4. The fatty acids are absorbed into the bloodstream, and the gases vented by eructation and exhalation by the animal. Unfermented feed and microbial cells pass to the intestines.

In Solomon Islands, most cattle manure is managed as a solid on pastures and ranges, except dairy cows where there is some usage of lagoons. About half of the swine manure is managed in anaerobic lagoons. Total methane produced due to enteric fermentation was 7.75 kt (viz 11.18 kt CO_2 eq) in 2022. Furthermore, as can be seen in figure 5.3 below, the enteric fermentation emissions have decreased by 52% over the period 2000-2022.

Figure 5.3: Total GHG emissions from Enteric Fermentation (kt CO_2 eq): 2000-2022



5.2.2 Methodological issues

Emissions from enteric fermentation were calculated using IPCC Tier 1 methodology and default EFs.

Equations 10.19 and 10.20 were used to calculate methane emissions from enteric fermentation (pp. 10.28, Vol.4, Chapter 10 of the 2006 IPCC Guidelines).

$$Emissions = EF_{(T)} \times \frac{N_{(T)}}{10^6} \text{ and}$$

$$CH_{Enteric} = \sum_i E_i$$

Where:

$CH_{4Enteric}$ = total methane emissions from Enteric Fermentation, kt CH_4 yr-1

E_i= is the emissions for the i^{th} livestock categories and subcategories

$EF_{(T)}$ = emission factor for the defined livestock population, kg CH_4 head-1 yr-1

$N_{(T)}$ = the number of head of livestock species / category T in the country

T = species/category of livestock

Activity data

The livestock population for year time series 2000-2022 were provided by Livestock Department Office under the Ministry of Agriculture & Livestock.

Table 5.1: Livestock population for estimating emissions from Enteric Fermentation (3A) and Manure Management (3B)

Year	Chickens	Pigs	Cattles
2000	–	50,000	13,000
2005	–	53,000	13,500
2010	–	55,783	13,860
2011	4,38,583	1,77,017	2,188
2012	4,50,158	1,81,689	2,246
2013	4,61,781	1,86,380	2,304
2014	4,73,340	1,91,045	2,362
2015	4,84,919	1,95,719	2,419
2016	4,96,580	2,00,425	2,478
2017	5,08,340	2,05,172	2,536
2018	5,20,214	2,09,964	2,596
2019	5,32,119	2,14,769	2,655
2020	5,44,070	2,19,593	2,715
2021	5,55,976	2,24,398	2,774
2022	5,68,088	2,29,287	2,834

Emission Factor

The default Tier 1 emission factors for calculating CH_4 emissions are provided in the 2006 IPCC Guidelines are tabulated in table below

Table 5.2: Emission Factors used for estimating CH_4 emissions from Enteric Fermentation

Species/Livestock category	Emission factor for Enteric Fermentation (kg head-1 yr-1)
Cattle	60

Swine	1
Poultry	-

5.2.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

5.2.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

5.2.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

5.2.6. Category-specific recalculations

For the years 2011-2020, the GHG emissions from this category were recalculated, using the livestock population data provided by the Ministry of Agriculture & Livestock (MAL)

Recalculation rationale:

- MAL provided new and more accurate data regarding the estimated population of the livestock. Therefore, the recalculation aimed to refine the emissions estimates using the updated data.

Implementing the changes in the current inventory caused estimated emissions from this category to increase by 53% (9.63 kt CO_2 eq) in 2011 and 6% (0.56 kt CO_2 eq) in 2020 (see table 5.3 below).

Table 5.3: Comparison of the previous submission and current inventory for emissions from Enteric Fermentation

Inventory Year	Previous Submission (kt CO_2 eq)	Current submission (kt CO_2 eq)	Change from previous submission (kt CO_2 eq)	% change
2011	18.26	8.63	-9.63	-53%
2012	17.32	8.86	-8.46	-49%
2013	16.37	9.09	-7.28	-44%
2014	15.43	9.32	-6.11	-40%
2015	14.48	9.54	-4.94	-34%
2016	13.54	9.77	-3.76	-28%
2017	7.84	10.01	2.16	28%
2018	11.65	10.24	-1.41	-12%

2019	11.00	10.47	-0.52	-5%
2020	10.15	10.71	0.56	6%

5.2.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

5.3 Manure Management (CRT category 3.B)

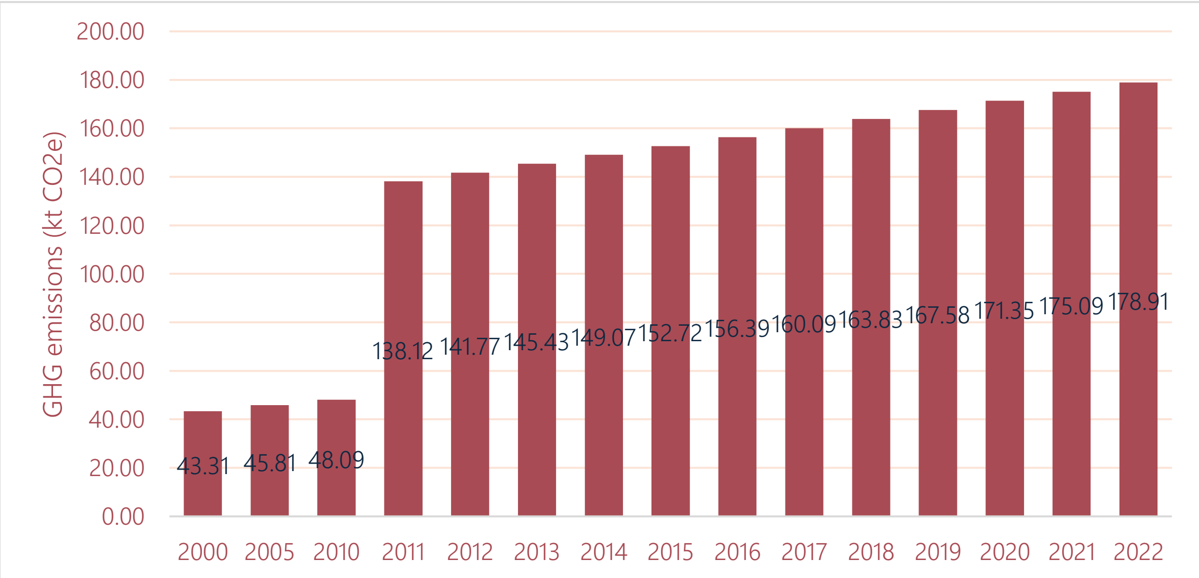
5.3.1 Category description

Methane is produced from the decomposition of organic matter remaining in manure under anaerobic conditions. These conditions occur when large numbers of animals are managed in a confined area, where manure is typically stored in large piles or lagoons.

Direct N_2O emissions from manure management systems (MMS) can occur via combined nitrification and denitrification of ammoniacal nitrogen contained in the wastes. The amount released depends on the systems and duration of waste management. Indirect N_2O emissions occur via runoff and leaching, and the atmospheric deposition of N volatilised from the MMS.

Manure management emitted 5.52 kt of CH_4 and 0.09 kt of N_2O in 2022. The total GHG emissions from this category was 178.91 kt CO_2 eq. Furthermore, as can be seen in the figure below, the GHG emissions from this category have increased by 313% from 2000 to 2022.

Figure 5.4: Total GHG emissions from Manure Management (kt CO_2 eq): 2000-2022



5.3.2 Methodological issues

Activity data is the same as used for enteric fermentation. CH_4 and N_2O emissions were estimated using Tier 1 approach. Total methane was estimated for a particular category of livestock by multiplying the manure management emission factor with total dung produced which is estimated by taking digestibility of the feeds into account. The IPCC 2006 default value for the region has been used for calculation.

CH_4 Emissions:

The equation 10.22 was used to calculate methane emissions from manure fermentation (pp. 10.37, Vol.4, Chapter 10 of the 2006 IPCC Guidelines):

$$CH_{4\ Manure} = \sum_{(T)} \frac{EF_{(T)} \times N_{(T)}}{10^6}$$

Where:

$CH_{4Manure}$ = CH_4 emissions from manure management, for a defined population, kt CH_4 yr-1

$EF_{(T)}$ = emission factor for the defined livestock population, kg CH_4 head-1 yr-1

$N_{(T)}$ = the number of head of livestock species/category T in the country

T = species/category of livestock

Direct N_2O Emissions:

The Tier 1 method entails multiplying the total amount of N excretion (from all livestock species/categories) in each type of manure management system by an emission factor for that type of manure management system. Emissions are then summed over all manure management systems. The Tier 1 method is applied using IPCC default N2O emission factors, default nitrogen excretion data, and default manure management system data (see from Annex 10A.2, Tables 10A-4 to 10A-8 for default management system allocations in Vol.4, Part 2, Chapter 10 of the 2006 IPCC Guidelines).

The equation 10.25 was used to calculate methane emissions from manure fermentation (pp. 10.54, Vol.4, Chapter 10 of the 2006 IPCC Guidelines):

$$N_2O_{D(mm)} = \left[\sum_S \left[\sum_T \left(N_T \times N_{ex\ T} \times MS_{T,S}\right) \times EF_{3(S)}\right] \times \frac{44}{28}\right. \qquad \text{(Equation 5.3)}$$

Where:

$N_2O_{D(mm)}$ = direct N_2O emissions from Manure Management in the country, kg N_2O yr-1

$N_{(T)}$ = number of head of livestock species/category T in the country

$N_{ex(T)}$ = annual average N excretion per head of species/category T in the country, kg N animal-1 yr-1

$MS_{(T,S)}$ = fraction of total annual nitrogen excretion for each livestock species/category T that is managed in manure management system S in the country, dimensionless

$EF_{3(S)}$ = emission factor for direct N_2O emissions from manure management system S in the country, kgN_2O-N/kg N in manure management system S

S = manure management system

T = species/category of livestock

44/28 = conversion of $(N_2O\text{-}N)_{(mm)}$ emissions to $N_2O_{(mm)}$ emissions

Indirect N_2O Emissions:

The Tier 1 calculation of N volatilization in forms of NH_3 and NOx from manure management systems is based on multiplication of the amount of nitrogen excreted (from all livestock categories) and managed in each manure management system by a fraction of volatilized nitrogen. N losses are then summed over all manure management systems. The Tier 1 method is applied using default nitrogen excretion data, default manure management system data (see Annex 10A.2, Tables 10A-4 to 10A-8 of the Vol.4, Chapter 10 of the 2006 IPCC Guidelines) and default fractions of N losses from manure management systems due to volatilization (see Table 10.22):

The equation 10.26 was used to calculate indirect N_2O emissions from manure fermentation (pp. 10.54, Vol.4, Chapter 10 of the 2006 IPCC Guidelines):

$$N_{volatilization-MMS} = [\sum_S[\sum_T(N_T \times N_{ex\,T} \times MS_{T,S}) \times \frac{Frac_{GasMS}}{100}]\,(T,s)]]$$

Where:

$V_{olatilization\text{-}MMS}$ = amount of manure nitrogen that is lost due to volatilization of NH_3 and NOx, kg N yr-1

$N_{(T)}$ = number of head of livestock species/category *T* in the country

$N_{ex(T)}$ = annual average N excretion per head of species/category *T* in the country, kg N animal-1 yr-1

$MS_{(T,S)}$ = fraction of total annual nitrogen excretion for each livestock species/category *T* that is managed in manure management system *S* in the country, dimensionless

$Frac_{GasMS}$ = percent of managed manure nitrogen for livestock category *T* that volatilizes as NH_3 and Nox in the manure management system *S*, %

The indirect N2O emissions from volatilization of N in forms of NH_3 and NOx ($N_2O_{G(mm)}$) are estimated using Equation 10.27 of Vol.4, Chapter 10 of the 2006 IPCC Guidelines:

$$N_2O_{G(mm)} = N_{volatilization-MMS} \times EF_4) \times \frac{44}{28}$$

Where:

$N_2O_{G(mm)}$ = indirect N_2O emissions due to volatilization of N from Manure Management in the country, kg N_2O yr-1

EF_4 = emission factor for N_2O emissions from atmospheric deposition of nitrogen on soils and water surfaces, kg N_2O-N (kg NH_3-N + NOx-N volatilised)$^{-1}$

Emission Factor

When using Tier 1 method, methane emission factors by livestock category or subcategory are used. The following table represents the CH_4 default emission factors for Manure Management by average annual temperature for each of the relevant livestock species.

Table 5.4: Emission Factors used for estimating CH_4, Direct and Indirect N_2O emissions from Manure Management

Species/Livestock category	Emission factor for Manure Management $EF_{(T)}$ kg CH_4 head-1 yr-1	Emission factor for direct N_2O-N emissions from MMS EF_3 kg N_2O-N/kg N	Default N excretion rate $N_{rate(T)}$ kg N animal-1 yr-1	Fraction of managed livestock manure nitrogen that volatilizes $Frac_{(GasMS)}$	Emission factor for N_2O emissions from atmospheric deposition of nitrogen on soils and water surfaces (EF_4) kg N_2O-N/(kg NH_3-N + NOx-N volatilised)
Cattle	2	0.01	0.5	30%	0.01
Swine	24	0.01	0.46	48%	0.01
Poultry	0.02	0.01	0.82	12%	0.01

5.3.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

5.3.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

5.3.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

5.3.6. Category-specific recalculations

For the years 2011-2020, the GHG emissions from this category were recalculated, using the livestock population data provided by the Ministry of Agriculture & Livestock (MAL)

Recalculation rationale:

- MAL provided new and more accurate data regarding the estimated population of the livestock. Therefore, the recalculation aimed to refine the emissions estimates using the updated data.

Implementing the changes in the current inventory caused estimated emissions from this category to increase by 82% (62.11 kt CO_2 eq) in 2011 and 49% (56.28 kt CO_2 eq) in 2020 (see table 5.3 below).

Table 5.5: Comparison of the previous submission and current inventory for emissions from Manure Management

Inventory Year	Previous Submission (kt CO_2 eq)	Current submission (kt CO_2 eq)	Change from previous submission (kt CO_2 eq)	% change
2011	76.01	138.12	62.11	82%
2012	80.51	141.77	61.26	76%
2013	85.01	145.43	60.42	71%
2014	89.51	149.07	59.56	67%
2015	94.00	152.72	58.71	62%
2016	98.50	156.39	57.89	59%
2017	116.66	160.09	43.43	37%
2018	107.50	163.83	56.33	52%
2019	110.79	167.58	56.79	51%
2020	115.07	171.35	56.28	49%

5.3.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

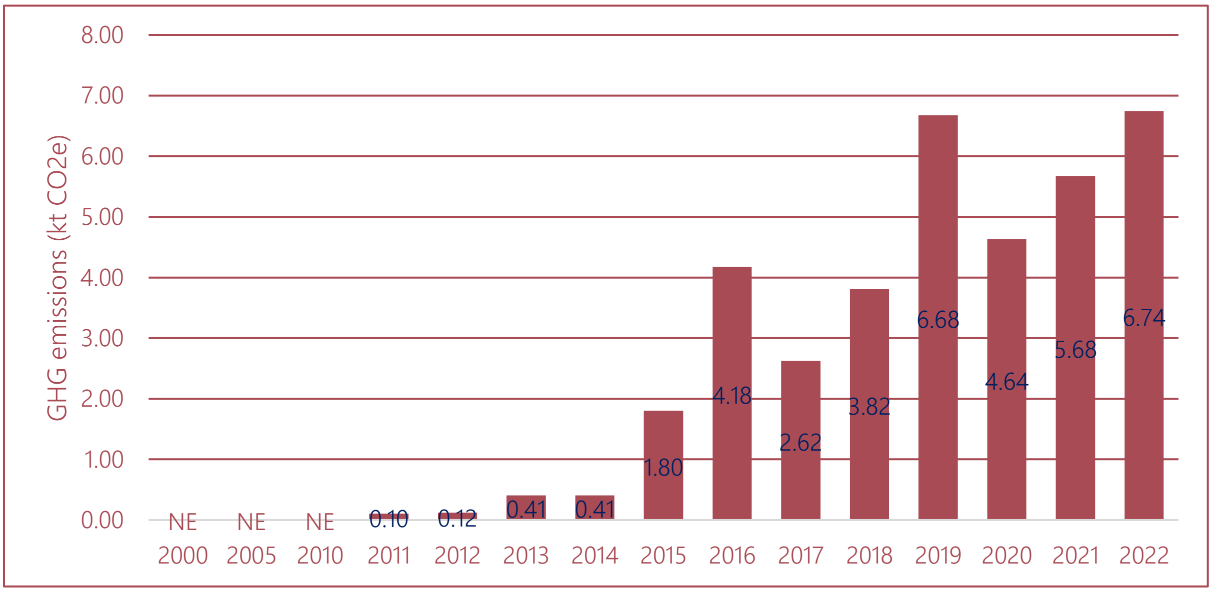
5.4 Agricultural soils (CRT category 3.D)

5.4.1 Category description

Nitrous oxide is produced as an intermediate in the denitrification reaction and as a by-product of nitrification. The availability of inorganic nitrogen in the soil is a controlling factor in the process and therefore, N_2O emissions are estimated through human-induced N additions into the soil or N mineralization. Emissions of N_2O occur through direct and indirect pathways. Direct emissions result from the addition or release of N directly from the soil, while indirect emissions occur through volatilization of NH_3 and NOx from managed soils, or after leaching and runoff of N mainly as NO_3^-.

In 2022, nitrous oxide emissions from agricultural soil accounted for 6.74 kt viz 3.4% of the sectoral emissions. Nitrogen inputs that are considered for direct and indirect nitrous oxide emissions from soils are only from application of synthetic nitrogen fertilizers (F_{SN}).

Figure 5.5: Total GHG emissions from Agricultural soils (kt CO_2 eq): 2000-2022



5.4.2 Methodological issues

IPCC Tier 1 methodologies were applied for the calculation of both direct and indirect soil emissions.

Direct N_2O emissions (kg N_2O-N/year) were calculated using Tier 1 methodology, according to Equation 11.1 (pp. 11.7) of Vol 4, Chapter 11 of the 2006 IPCC Guidelines.

Indirect N_2O emissions due to atmospheric deposition of nitrogen volatilized from managed soils were calculated according to Equation 11.9, page 11.24 Vol 4, Chapter 11 of the 2006 IPCC Guidelines. Equation 11.10 was used to calculate N_2O emissions due to nitrogen leaching/runoff from managed soils.

Total N_2O emissions (kg N_2O-N/year) for the category were calculated as the sum of direct and indirect emissions.

Activity data

The activity data provided by the Customs department has been used to estimate emissions. The estimated kg N-input to soils (FS_N) applied to the soil for the year 2022 was 12,22,319 kg.

Table 5.6: Activity data used for estimating CH_4, Direct and Indirect N_2O emissions from Agricultural soils: 2011-2022

Year	Amount of Synthetic Fertilizer applied to soil (kg)	FSN (kg)
2011	41030	18963
2012	121825	22420
2013	4095	1585
2014	406826	74006
2015	728906	326903
2016	1646023	756803
2017	1034698	475622
2018	1533774.8	691480
2019	2636785	1209885
2020	1876072	840388
2021	2276127	1029020
2022	2681446	1222319

Emission Factor

Default emission factors recommended by the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for Tier 1 were used in the calculations.

Default emission factors values were used to estimate direct N_2O emissions in accordance with Table 11.1. of Vol 4, Chapter 11 of the 2006 IPCC Guidelines and is presented in table below.

Table 5.7: Default emission factors for estimating direct N_2O emissions from managed soils

Default emission factors for estimating direct N_2O emissions from managed soils	
Emission factor	Default value
EF1 for N additions from mineral fertilisers, organic amendments and crop residues, and N mineralised from mineral soil as a result of loss of soil carbon [kg N_2O–N (kg N)-1]	0.01

Table 5.8: Default emission factors for estimating indirect N_2O emissions from managed soils

Default emission factor values from Table 11.3 of Vol 4, Chapter 11 of the 2006 IPCC Guidelines were used to estimate indirect N_2O emissions from managed soils and presented in table below:

Default emission factors for estimating direct N_2O emissions from managed soils	
Emission factor	Default value
EF4 [N volatilization and re-deposition], kg N_2O-N/(kg NH_3-N + NOX-N volatilized)	0.010
EF5 [leaching/runoff], kg N_2O–N /(kg N leaching/runoff)	0.0075
FracGASF [volatilization from synthetic fertilizer], (kg NH_3–N + NOx–N)/(kg N applied)-1	0.10

FracLEACH-(H) [N losses by leaching/runoff for regions where Σ(rain in rainy season) - Σ (PE in same period) > soil water holding capacity, OR where irrigation (except drip irrigation) is employed], kg N (kg N additions or deposition by grazing animals)	0.30

5.4.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

5.4.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

5.4.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

5.4.6. Category-specific recalculations

There are no recalculations for this category.

5.4.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

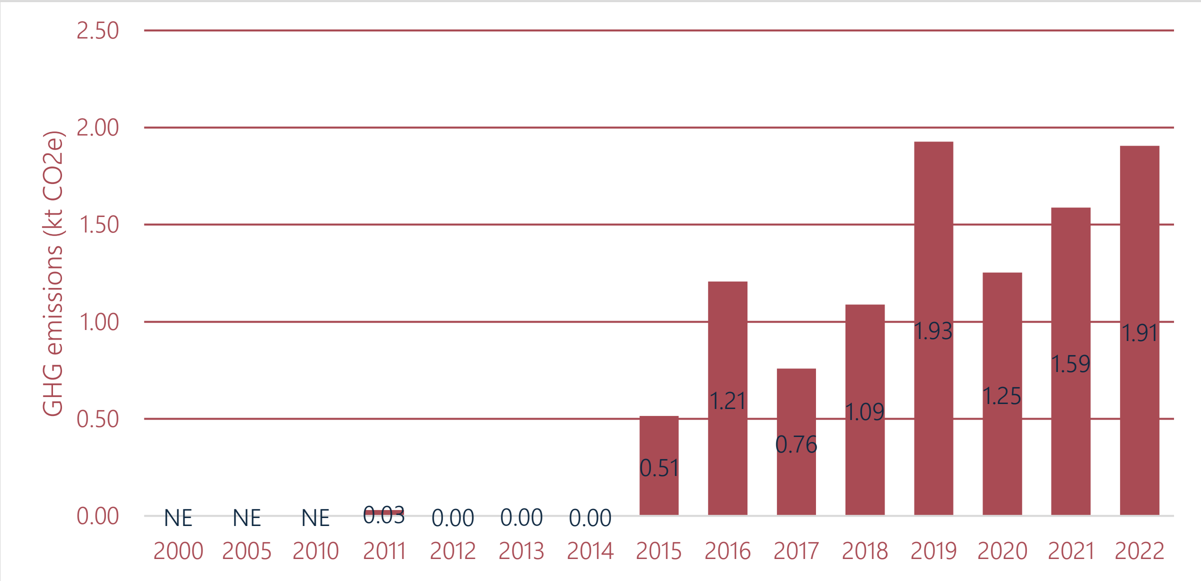
5.5 Urea application (CRT category 3.H)

5.5.1 Category description

Under this sub-category the emissions resulting from application of urea to soil are estimated. Adding urea to soils during fertilization leads to a loss of CO2 that was fixed in the industrial production process.

There has been a substantial increase in urea applied to agricultural land as synthetic fertilizer, from 40.54 tonnes in 2011 to 2,598.59 tonnes in 2012. In 2022, the emissions from this sub-category were estimated at 1.91 kt CO_2 eq.

Figure 5.5: Total GHG emissions from Urea application on land (kt CO_2 eq): 2000-2022



5.5.2 Methodological issues

The Tier 1 methodology has been applied to estimate CO_2 emissions from urea fertilization in accordance with Equation 11.13, age 11.32 Vol 4, Chapter 11 of the 2006 IPCC Guidelines.

Solomon Islands has no fertilizer production plant and all the fertilizers including Urea is imported to the country. Also, the data on sales and/or usage of urea annually is poorly monitored or recorded and maintained in the country. To this end, it is assumed that all urea fertilizer imported in a particular year is added to soils in the same year.

Activity data

The activity data used is the quantity of Urea imported into the country. Data provided by SINSO and Customs office has been used for estimating emissions from urea application for the period 2011-2022.

Table 5.9: Activity data for estimating CO_2 emissions from urea fertilization

Years	2011	201 2	201 3	201 4	2015	2016	2017	2018	2019	2020	2021	2022
Urea quantity (tonnes)	40.5 4	1.6 3	3.1 0	0.7 5	701. 25	1645. 07	1033. 66	1484. 34	2627. 13	1708. 91	2164. 80	2598. 59

Emission Factor

Default emission factors of 0.20 tonne of C/tonne of urea) as provided in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for Tier 1 were used in the calculations.

5.5.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

5.5.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

5.5.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

5.5.6. Category-specific recalculations

There are no recalculations for this category.

5.5.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

Chapter 6: Land use, land-use change and forestry (CRT sector 4)

6.1 Overview of the sector

Solomon Islands is a High Forest Cover Low Deforestation (HFLD) Country with low historical but very high and steeply increasing recent forest emissions due to logging pressure. The total land area of Solomon Islands is 2.8 million hectares. Solomon Islands has constructed Forest Reference Level (FRL)[9] in 2017. For the construction of its FRL, Solomon Islands used methodologies provided in the 2006 IPCC Guidelines. The Party classified its national land-use categories into the six land use categories of the 2006 IPCC Guidelines, further stratifying forest based on the global ecological zones of FAO, in order to select the appropriate default values for carbon stocks from the 2006 IPCC Guidelines.

For the study, the Activity data on historical land use and land-use change were obtained from the analysis of a combination of high- and low-resolution satellite images performed using Collect Earth, an open-source tool developed by FAO. The analysis covered the annual historical time series of land use and land-use change, as well as forest disturbances, for 2000–2017. As per the FRL study, Solomon Islands has a land area of 2.8 million hectares, of which 89.94% is covered by natural forests and forest plantations. The second major land use is Cropland, which covers 7.94% of the land area. Wetlands cover 0.96% and Grassland cover 0.25%, while other land covers 0.21% of the land area which includes bare soil and rock. Settlements, which include urban, villages, hamlets and infrastructure cover 0.70% of the total land area.

Solomon Islands had 2,529.64 kha of under forest land in year 2000, extending over 90.29% of its land area. However, the estimated area of forest land in 2022 is approximately 2,516.37 kha, representing about 89.82% of its total land area.

In 2022, net CO_2 emissions from LULUCF sector were -31,757.76 kt CO_2 eq. Emissions are occurring largely due to degradation and deforestation of forest land and its conversion to another land use mainly for purposes like harvesting of timber for exports, unsustainable logging for fuel wood and other forest resources, commercial agriculture and infrastructure development for growing population. The logging industry is the dominant sector within the economy. The National Forest Policy aims at ensuring sustainable and responsible management of forest resources and ecosystems for the benefit and resilience of all Solomon Islanders. This policy lays down forest conservation strategies for the conservation and protection of biodiversity and forest ecosystems, and promotion of ecosystem services for sustainable livelihood. It also aims to create incentives for the rehabilitation and restoration of degraded forest land in priority areas for forest conservation. Furthermore, the Logging Sustainability Policy 2018 provides a set of measures that

[9] Solomon Islands National Forest Reference Level, https://redd.unfccc.int/files/2019_submission_frel_solomon_islands.pdf

aim to prevent the depletion of timber resources. Effective implementation of this policy will lead to reduced degradation and deforestation of forest.

6.2. Land-use definitions and the land representation approach(es) used and their correspondence to the land use, land-use change and forestry categories

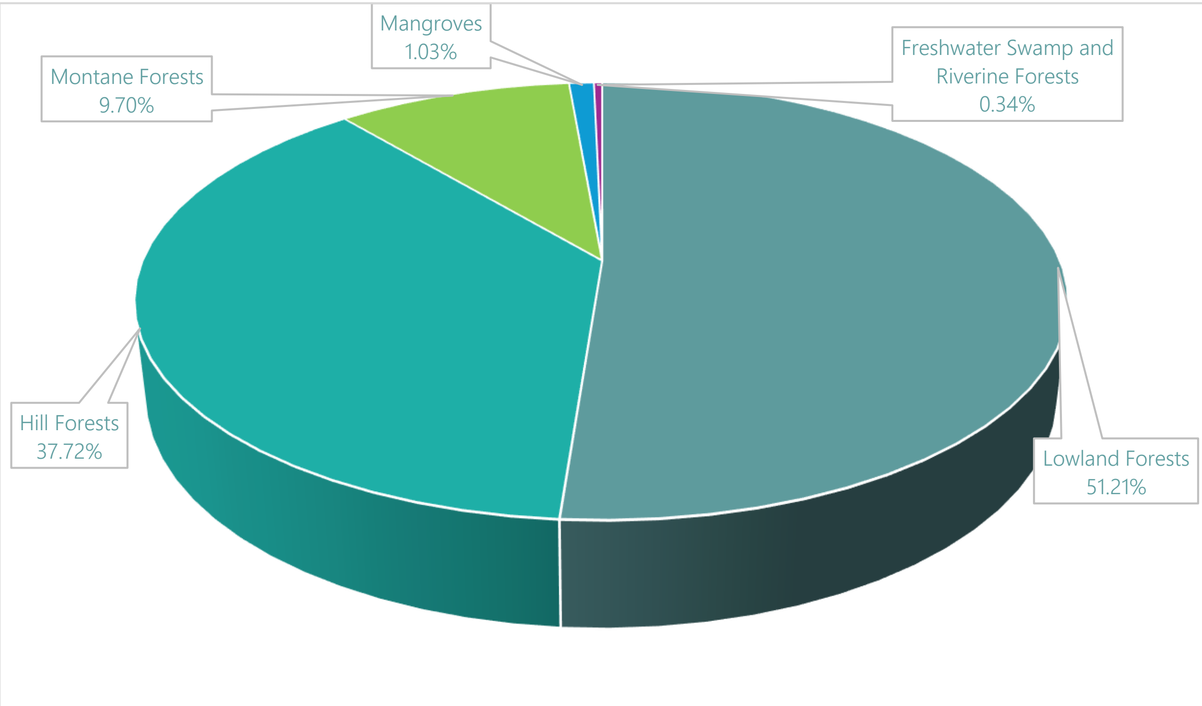
Solomon Islands has classified its national land-use categories into the six land use categories of the 2006 IPCC Guidelines i.e., i.e., Forest Land, Cropland, Grassland, Wetlands, Settlements, and Other Land. Further stratification of forests on the basis of the global ecological zones of FAO is also made, in order to select the appropriate default values for carbon stocks from the 2006 IPCC Guidelines. The table presented below illustrates the classification of the Solomon Islands main forest types and its categorization as per Global Ecological Zones of FAO[10].

Solomon Islands has adopted the FAO definition for its National Forest land. The FAO definition for Forest Land is "*Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use*"[11].

The vast majority of the forest area in the Solomon Islands is natural forest, followed by small areas of commercial plantations and community woodlots. Natural forests represent about 99% of the Forest land. While the Community woodlot and Industrial plantation represents the remaining 0.04% and 0.95% of the forest land respectively as shown in the figure.

Further, the five main types of natural forests in the order of their estimated area coverage/extension are Lowland Forests (51.21%), Hill Forests (37.72%), Montane Forests (9.70%), Mangroves (1.03%) and Freshwater Swamp and Riverine Forests (0.34%) as shown in figure 6.1.

Figure 6.1: Current composition of Nature Forest land types in the Solomon Islands



Further, in accordance with 2006 IPCC Guidelines, each land use category is further classified into "Land remaining Land" and "Land converted to Land" depending on its history of land-use conversion. As discussed earlier, in Solomon Islands the land use change is due to conversion of Forest land to Cropland and Settlements. However, due to lack of reliable data like national estimates on annual change of biomass stocks, area of perennial and annual crops and annual area subjected to harvesting, etc., estimating emissions/removals from most of the "Land remaining Land" category and "Land converted to Land" was not possible. Consequently, only emissions/removals from the category "Land remaining Land" has been estimated under this inventory for the year 2022 and discussed in the following section and sub-sections.

6.4 Forest Land (CRT category 4.A)

6.4.1 Forest Land Remaining Forest Land

6.4.1.1 Category Description

According to 2006 IPCC Guidelines, GHG inventory for this sub-category involves estimation of changes in carbon stock from five carbon pools (i.e., above-ground biomass, below-ground biomass, dead wood, litter and soil organic matter). The 2006 IPCC Guidelines do not provide default carbon stock values for deadwood and in case of litter, although 2006 IPCC Guidelines provide default carbon stock values for litter in some forest types, but not for the forest types which occur in the Solomon Islands. Furthermore, as the soil in Solomon Islands Forests are not classified into the soil types as provided in the 2006 IPCC Guidelines. Due to these reasons, it was not possible to estimate emissions from dead wood, litter and soil organic carbon pools and only emissions due to changes in carbon stocks in above-ground biomass and below-ground biomass) are estimated under this inventory.

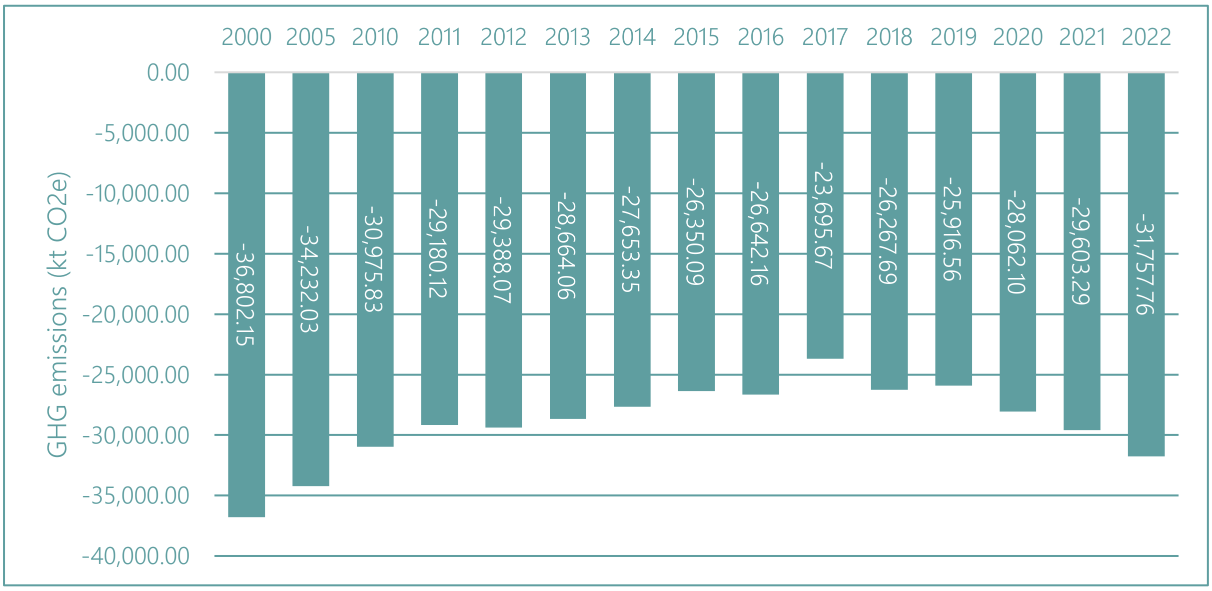
For the inventory, data on wood removals, including fuelwood removals are required. However, the data provided by the Solomon Islands Ministry of Forestry & Research and the Customs division covers information only on annual log export volume. Whereas the annual fuelwood removal quantities are not reported and monitored in the country indicating that the actual wood removal from Solomon Islands forests could be much higher and also the resulting emission levels. Consequently, net emissions/removals from this sub-category are estimated only due to changes in carbon stock in two carbon pools i.e., above-ground biomass and below-ground biomass and loss of carbon from wood removals.

The GHG emissions from forest land remaining forest land in 2022 was -31,757.76 kt CO_2 eq as presented in the table 6.3 below:

Table 6.3: Forest Land Remaining Forest Land: CO_2 emissions (kt CO_2 eq)

Years	Annual increase in biomass carbon stocks due to biomass growth (kt C yr-1)	Annual carbon loss due to biomass removals (kt C yr-1)	Net Annual Carbon Uptake (+) or Release (-) (kt C yr-1)	Convert to CO_2 Annual Emission (-) or Removal (+) (kt CO_2)
2000	10645.43	652.30	9993.14	-36641.50
2005	10634.27	1298.26	9336.01	-34232.03
2010	10614.38	2166.43	8447.95	-30975.83
2011	10614.38	2656.17	7958.21	–29180.12
2012	10612.16	2597.23	8014.93	–29388.07
2013	10609.94	2792.47	7817.47	–28664.06
2014	10609.65	3067.83	7541.82	–27653.35
2015	11286.86	3641.77	7645.09	–28032.01
2016	10605.22	3339.18	7266.04	–26642.16
2017	10603.00	4140.55	6462.46	–23695.67
2018	10598.21	3929.48	6668.72	–26267.69
2019	10595.61	3527.46	7068.15	-25,916.56
2020	10592.97	2939.67	7653.30	-28,062.10
2021	10590.32	2516.70	8073.62	-29,603.29
2022	10587.67	1926.47	8661.21	-31,757.76

Figure 6.2: Emissions from Forest land remaining Forest land (kt CO_2 eq): 2000-2022



6.4.1.2 Methodological issues

The methodology for estimating changes in forest biomass carbon and calculating CO_2 removals in the Forest Land Remaining Forest Land category were conducted in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories using the biomass Gain-Loss Method i.e., Equation 2.7 (pp. 2.12, Vol 4, Chapter 2 of the 2006 IPCC Guidelines) with and default factors. Average annual above-ground biomass growth (GW) was from table 4.12 of Chapter 4, Volume 4 of the 2006 IPCC Guidelines. The values of Ratio of below-ground biomass to above-ground biomass is taken from the FRL report for the Dense and Open Forest while for Plantation Forest and Mangroves are taken the table 4.12 of Chapter 4, Volume 4 of 2006 IPCC Guidelines.

Woody biomass carbon losses due to removals are estimated using Equations 2.11-2.13 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Emissions from Disturbances were not estimated due to lack of data.

Conversion of stored carbon to CO_2 eq units was performed by multiplying by the conversion factor (-44/12).

Since Tier 1 methodology was used, the carbon stock changes in dead organic matter and Soil organic carbon were not estimated.

Activity data

The activity data i.e. the forest land remaining forest land area for the period 2011 to 2022 were estimated using the Land use in Solomon Islands in the year 2018 and Forest cover land use change statistics as reported in the Solomon Islands National REDD+ Forest Reference Level (Modified Submission for UNFCCC Technical Assessment in 2023) and presented in below tables 6.4.

Table 6.4: Area of Forest land remaining forest land (kha): 2000-2022

Year	Forest (kha)	a) Natural Forest (kha)	Lowland Forests (kha)	Hill Forests (kha)	Montane Forests (kha)	Mangroves (kha)	Freshwater Swamp and Riverine Forests (kha)	b) Industrial Plantation (kha)	c) Community Woodlot (kha)
2000	2529.64	2504.65	1285.64	942.75	242.20	25.55	8.52	24.01	0.98
2001	2529.15	2504.16	1285.64	942.26	242.20	25.55	8.52	24.01	0.98
2002	2528.64	2503.65	1285.13	942.26	242.20	25.55	8.52	24.01	0.98
2003	2528.15	2503.16	1285.13	941.77	242.20	25.55	8.52	24.01	0.98
2004	2528.15	2503.16	1285.13	941.77	242.20	25.55	8.52	24.01	0.98
2005	2527.17	2502.18	1284.15	941.77	242.20	25.55	8.52	24.01	0.98
2006	2526.67	2501.69	1283.65	941.77	242.20	25.55	8.52	24.01	0.98
2007	2525.69	2500.71	1283.16	941.28	242.20	25.55	8.52	24.01	0.98
2008	2524.71	2499.72	1282.18	941.28	242.20	25.55	8.52	24.01	0.98
2009	2523.73	2498.74	1281.20	941.28	242.20	25.55	8.52	24.01	0.98
2010	2522.75	2497.76	1280.71	940.79	242.20	25.55	8.52	24.01	0.98
2011	2522.75	2497.76	1280.71	940.79	242.20	25.55	8.52	24.01	0.98
2012	2522.26	2497.27	1280.22	940.79	242.20	25.55	8.52	24.01	0.98
2013	2521.77	2496.78	1279.73	940.79	242.20	25.55	8.52	24.01	0.98
2014	2521.28	2496.29	1279.73	940.79	241.71	25.55	8.52	24.01	0.98
2015	2521.28	2496.29	1279.73	940.79	241.71	25.55	8.52	24.01	0.98
2016	2520.29	2495.31	1278.75	940.79	241.71	25.55	8.52	24.01	0.98

2017	2519.80	2494.82	1278.25	940.79	241.71	25.55	8.52	24.01	0.98
2018	2518.74	2493.75	1277.67	940.31	241.71	25.55	8.52	24.01	0.98
2019	2518.21	2493.23	1277.20	940.20	241.77	25.55	8.52	24.01	0.98
2020	2517.60	2492.61	1276.73	940.08	241.74	25.55	8.52	24.01	0.98
2021	2516.99	2492.00	1276.26	939.97	241.71	25.55	8.52	24.01	0.98
2022	2516.37	2491.39	1275.78	939.86	241.68	25.55	8.52	24.01	0.98

The data for estimation of CO_2 removals from forests is as provided in the Annual reports of Central Bank of Solomon Islands.

Table 6.5: Conversion factors for biomass increment and losses in Forest Land remaining Forest land

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Log Export Volume (1000m^3)	536.00	509.40	584.20	738.90	968.30	1066.80	1150.50	1583.01	1665.53	1386.63	1780.18	2182.60
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Log Export Volume (1000m^3)	2134.18	2294.61	2520.87	2812.94	2743.85	3402.34	2822.00	2898.56	2415.56	2068.00	1583.00	

Emission Factor

The Conversion factors for biomass increment and losses in Forest Land remaining Forest land used in calculations are presented in below table.

Table 6.5: Conversion factors for biomass increment and losses in Forest Land remaining Forest land

Parameter	*Lowland Forests*	*Hill Forests*	*Montane Forests*	*Mangroves*	*Freshwater Swamp and Riverine Forests*	*Industrial Plantation*	*Community Woodlot*	*Source*
Average annual above-ground biomass growth (tonnes dm ha-1 yr-1)	7	7	1	9.9	7	15	15	1. Table 4.12, Chapter 4, Volume 4 2006 IPCC Guidelines, Page: 63 2. For mangroves: 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, Page: 167-168
Ratio of below-ground biomass to above-ground biomass [tonnes bg dm (tonne ag dm)-1]	0.37	0.37	0.27	0.49	0.37	0.37	0.37	Table 4.4, Chapter 4, Volume 4 2006 IPCC Guidelines, Page: 49
Carbon fraction of dry matter	0.47	0.47	0.47	0.47	0.47	0.47	0.47	Table 4.3, Chapter 4, Volume 4 2006 IPCC Guidelines, Page: 48

6.4.1.3. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

6.4.1.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

6.1.4.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

6.1.4.6. Category-specific recalculations

There are no recalculations for this category.

6.1.4.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

Chapter 7: Waste (CRT sector 5)

7.1 Overview of the sector

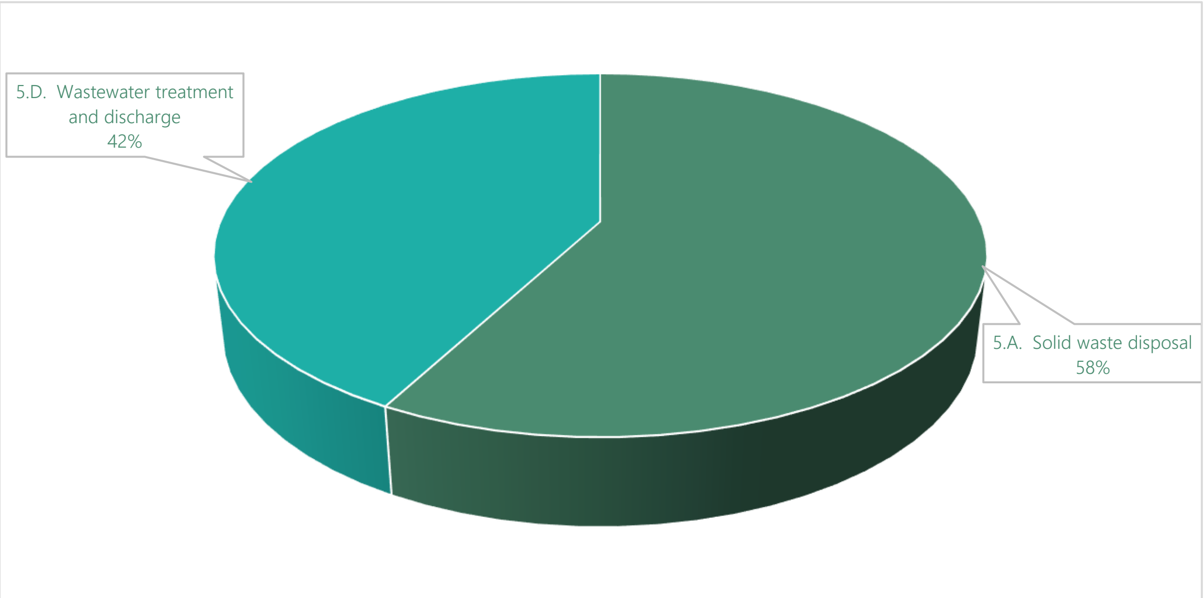
In Solomon Islands, the waste sector covers methane (CH_4) and nitrous oxide (N_2O) from the following key categories:

- 5.A. Solid waste disposal
- 5.D. Wastewater treatment and discharge (mainly Domestic wastewater handling since there is no industrial wastewater generation)

The GHG emissions from the category biological treatment of solid waste (5B) and Incineration and open burning of waste (5C) are not estimated in this inventory due to absence of data.

In 2022, the waste sector emissions were 54.37 kt CO_2 eq viz about 9.42 % of the total national GHG emissions. The GHG emissions from Solid waste disposal emissions is about 31.44 kt CO_2 eq (58% of the sectoral emissions) are wastewater treatment and discharge emissions are 22.92 kt CO_2 eq (42% of the sectoral emissions).

Figure 7.1: Waste sector GHG emissions: 2022



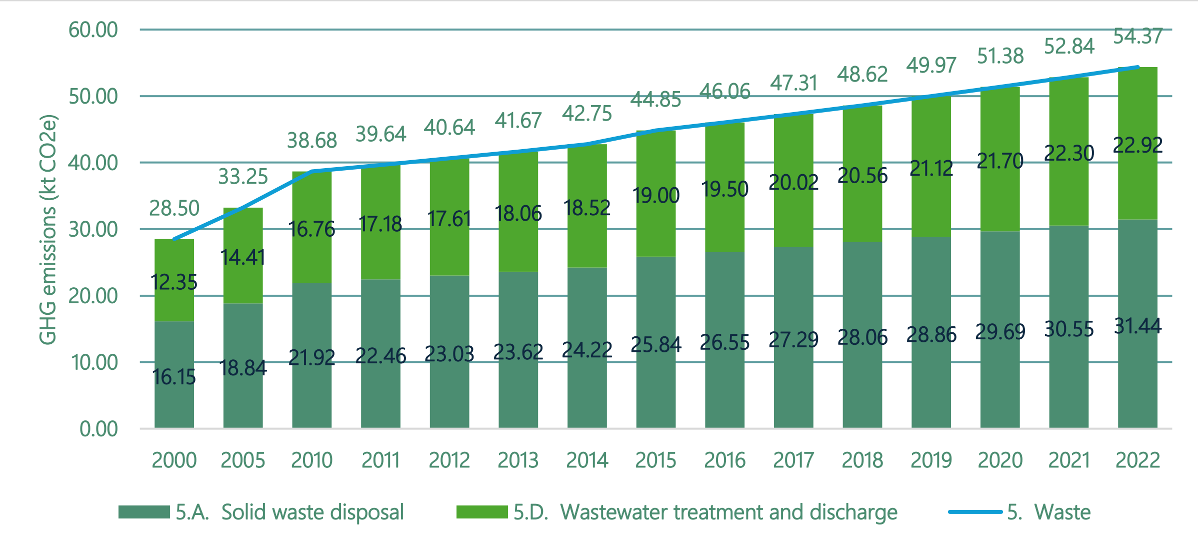
The total methane (CH_4) emissions form waste sector was 1.57 kt and nitrous oxide (N_2O) emissions were 0.04 kt. CH_4 emissions occur from solid and wastewater disposal and N_2O is mainly emitted from wastewater discharge. The following table illustrates the waste sector emissions:

Table 7.1: Waste Sector GHG Emissions (kt): 2022

Category	CH_4 (kt)	N_2O (kt)	Total GHG Emissions (kt CO_2 eq)
5. Waste	1.57	0.04	54.37
5.A. Solid waste disposal	1.12	-	31.44
5.D. Wastewater treatment and discharge	0.45	0.04	22.92

As can be seen below in figure 7.2, the GHG emissions from the waste sector show an increasing trend over the period 2000 to 2022. Moreover, it has decreased by 44% during the period 2000 to 2022.

Figure 7.2: Waste sector GHG emissions (kt CO_2 eq): 2000-2022



7.2 Solid Waste Disposal (CRT category 5.A)

7.2.1 Category description

Solomon Islands is one of fifteen Pacific Island Nations which took part in the PacWastePlus Programme implemented through the Secretariat of the Pacific Regional Environment Programme (SPREP) and funded by the European Union Delegation of the Pacific. Waste data collation, analysis and reporting for the Solomon Islands National Waste Audit Analysis Report[12] was guided by the overarching Regional Waste Data Collection, Monitoring, and Reporting (DCMR) Framework for the Pacific Island Countries and Territories (PICT).

Solomon Islands' waste management practices primarily rely on burying, burning, and dumping. Landfilling is practiced to some extent in Guadalcanal, especially near the capital city of Honiara. There is limited access to proper waste collection and disposal infrastructure and facilities, leading to environmental degradation and health hazards. Investment in infrastructure, implementation

[12] Solomon Islands MSW Composition from Solomon Islands National Waste Audit Analysis Report (August 2023), Authors: PacWastePlus and MRA https://pacwasteplus.org/resources/solomon-islands-national-waste-audit-analysis-report/

of data-guided decision making, and increased general waste management education will improve the current situation.

Landfills in Solomon Islands

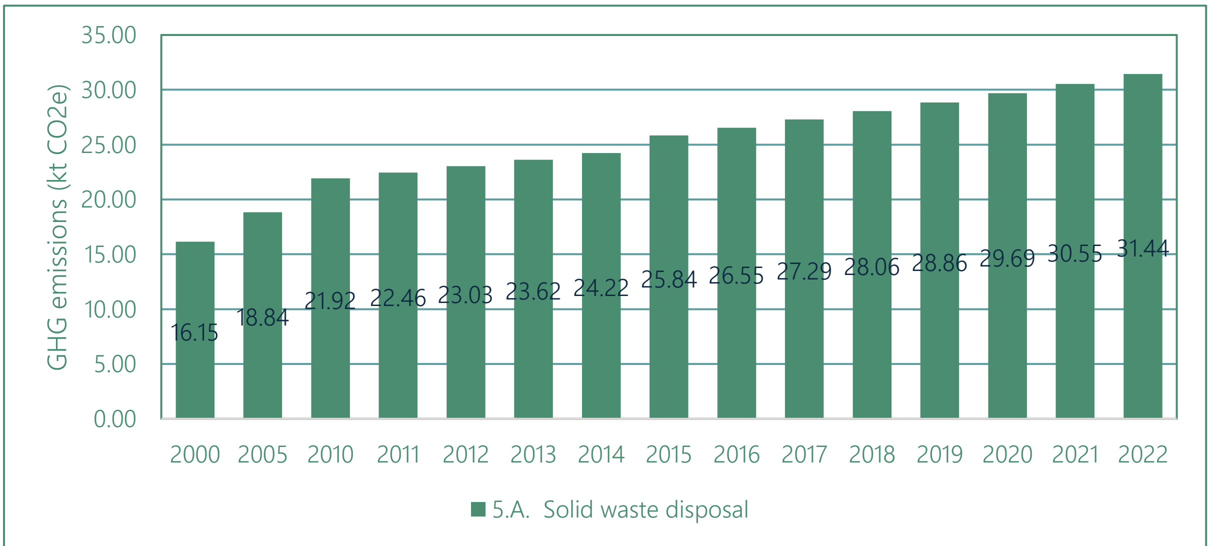
Landfills in the Solomon Islands are managed locally by the works division of the town council or provincial government. On the outer islands that lack government managed landfills, waste is disposed via informal dumpsites, burning and burying. The largest landfill in the Solomon Islands is Ranadi landfill, servicing the greater Honiara area and is a semi-aerobic type of landfill. Besides the Ranadi landfill, there are provincial dumpsites operated by Provincial governments to manage waste disposal outside of Honiara & Guadalcanal. There are 6 unregulated waste facilities in the country. Most of these facilities lack security (fencing or locking gates) and dedicated staff. There is very minimal active leachate or litter management at provincial dumpsites. – Ranadi Landfill (Honiara/Guadalcanal). Many are also running out of available airspace, creating additional pressure on the surrounding areas and leading to an increase in waste burning practices.

- Tulagi Disposal site (Central Province)
- Auki Disposal site (Malaita)
- Kirakira Disposal site (Makira-Ulawa)
- Gizo Disposal site (Western Province)
- Noro Disposal site (Western Province)

Minimal or no active leachate management at provincial dumpsites. Most of these facilities lack security (fencing or locking gates) or dedicated staff. Due to the 'unregulated' nature of disposal, gate fees are rarely charged to residents. As per the National Waste Audit Analysis Report, per capita waste generation rate of Solomon Islands is 71.5 kg/capita/year.

The GHG emissions from this category was about 31.44 kt CO_2 eq in year 2022 which is about 58% of the sectoral emissions. Moreover, the emissions have increased by 94.67% during the period 2000 to 2022. The figure 7.3 below presents the emissions from this category for the period 2000 to 2022.

Figure 7.3: Solid Waste Disposal GHG Emissions (kt CO_2 eq): 2000- 2022



7.2.2 Methodological issues

The IPCC Tier 1 First Order Decay (FOD) model has been applied for calculation of methane emission from landfill sites. In a FOD model, the decay rate of carbon in the waste is governed by a first order reaction. Thus, the rate of decay is directly proportional to the amount of carbon remaining in the disposal site. This model is built on an exponential factor that describes the fraction of degradable material which each year is degraded into CH_4 and CO_2. One key input in the model is the amount of degradable organic matter in the waste disposed at the solid waste disposal site. Degradable Organic Carbon (DOC) is the organic carbon in the waste that is amenable to biochemical decomposition. The basis for the calculation is the amount of Decomposable Degradable Organic Carbon (part of the organic carbon that will be degradable under an anaerobic condition) at the disposal site of solid waste after initial decomposition under aerobic conditions.

The equations 7.1 to 7.3 as outlined below are used for First order of decay (FOD) method estimate for solid waste sent to landfill as provided in the 2006 IPCC Guidelines and IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000) are given below:

CH_4 emissions- FOD equation

$$CH_4\ emissions\ =\ \{\textstyle\sum_x [MSW_x \times L_o(x) \times ((1 - e^{-k}) \times e^{-k(t-x)})] - R(t)\} \times (1 - OX)$$

(Equation 7.1)

Where:

CH_4 emissions = Total CH4 emissions in tonnes

x = Landfill opening year or earliest year of historical data available

t = Inventory year

MSW_x = Total municipal solid waste disposed at SWDS in year x in tonnes

R = Methane collected and removed (ton) in inventory year

L_0= Methane generation potential

K = Methane generation rate constant, which is related to the time taken for the DOC in waste to decay to half its initial mass (the "half-life"); User Input or consult default value of 2006 IPCC guidelines

OX = Oxidation factor

Methane generation potential (L_0)

$$L_0\ =\ MCF \times DOC \times DOCf\ \times F \times \frac{16}{12}$$

(Equation 7.2)

Where:

MCF = Methane Correction Factor

DOC = Degradable Organic Content

DOC_f = Fraction of DOC that is ultimately degraded

Degradable organic carbon (DOC)

$$DOC = (0.4 \times A) + (0.17 \times B) + (0.15 \times C) + (0.3 \times D) \qquad \text{(Equation 7.3)}$$

Where:

A = Fraction of MSW that is paper and textiles

B = Fraction of MSW that is garden waste, park waste or other non-food organic putrescibles

C = Fraction of MSW that is food waste

D = Fraction of MSW that is wood or straw

Activity data

In the absence of actual monitored data, the MSW generation in Solomon Islands has been estimated from the total population of the country and using per capita waste generation rate of 71.50 kg/capita/year from the Solomon Islands National Waste Audit Analysis Report (2023). The human population data were estimated based on the historical national human census reports and the population projection results of the 2019 National Population and Housing Census Report Honiara, Solomon Islands [13].

The activity data used for estimating GHG emissions are presented in table 7.2.

Table 7.2: Activity data for solid waste disposal in 2000-2022

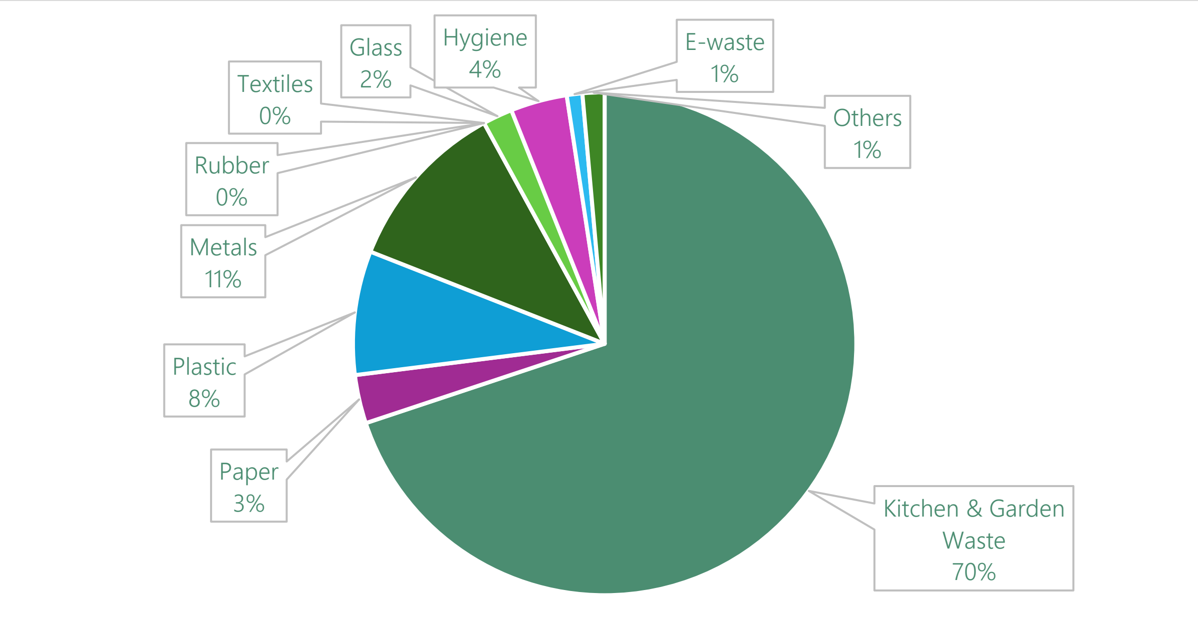
Population	Honiara Population	Rest of the country Population	Total Population	MSW Generation rate (Kg/capita/year)	Total Solid Waste (MSW) generated-Ton	Waste disposed at un-managed sites (landfill, open dumping) - Ton	Waste disposed at managed sites (landfill) - Ton
2000	51,156	3,70,477	4,21,633	71.50	30,147	30,147	-
2005	62,759	4,29,204	4,91,963	71.50	35,175	35,175	-
2010	78,178	4,94,046	5,72,224	71.50	40,914	40,914	-
2011	82,692	5,03,788	5,86,480	71.50	41,933	41,933	-
2012	87,467	5,13,780	6,01,247	71.50	42,989	42,989	-

[13] Solomon Islands National Statistics Office (2023), National Population and Housing Census Report (Vol 1), Chapter 16, Population Projections, Honiara, Solomon Islands https://solomons.gov.sb/wp-content/uploads/2023/09/Solomon-Islands-2019-Population-and-Housing-Census_National-Report-Vol-1.pdf f

2013	92,518	5,24,030	6,16,548	71.50	44,083	44,083	-
2014	97,860	5,34,545	6,32,405	71.50	45,217	45,217	-
2015	1,03,511	5,45,333	6,48,844	71.50	46,392	38,991	7,401
2016	1,09,488	5,56,401	6,65,889	71.50	47,611	39,783	7,828
2017	1,15,810	5,67,761	6,83,571	71.50	48,875	40,595	8,280
2018	1,22,497	5,79,419	7,01,916	71.50	50,187	41,428	8,759
2019	1,29,569	5,91,387	7,20,956	71.50	51,548	42,284	9,264
2020	1,37,051	6,03,672	7,40,723	71.50	52,962	43,163	9,799
2021	1,44,964	6,16,284	7,61,248	71.50	54,429	44,064	10,365
2022	1,53,335	6,29,233	7,82,568	71.50	55,954	44,990	10,963

The MSW composition as provided in the Solomon Islands National Waste Audit Report (2023) and used for the GHG emissions estimation is presented in the figure below.

Figure 7.4: MSW Characterization (wt%) – Solomon Islands National Waste Audit Analysis Report (2000-2022)



Emission factor

Methane conversion factor (MCF) by landfill type, degradable organic carbon (DOC), degradable organic carbon fraction (DOC_f), and some other parameters were assumed by default due to the lack of national data.

The default values used for MSW were taken from the 2006 IPCC Guidelines.

Table 7.3: Default parameters used in calculations of methane emissions from MSW landfills

Parameter	Value	Source
Methane correction factor (MCF)- Unmanaged – shallow (<5 m waste)	0.4	Table 3.1: SWDS classification and methane correction factors (MCF), 2006 IPCC Guidelines, Vol. 6, Ch. 3
Methane correction factor (MCF)- Managed – shallow	0.5	Table 3.1: SWDS classification and methane correction factors (MCF), 2006 IPCC Guidelines, Vol. 6, Ch. 3
Fraction of DOC that is ultimately degraded (DOC_f)	0.5	Recommended default value in 2006 IPCC Guidelines, Vol 4 Ch.3
Fraction of methane in landfill gas (F)	0.5	IPCC default range (0.4-0.5) 0.5 is considered
Oxidation Factor	0	IPCC default value
Methane generation rate constant (k) Tropical (MAT > 20°C) Dry (MAP < 1000 mm)	11	Default value in table 3.4 of 2006 IPCC guidelines, vol. 3: waste, chapter 3: solid waste disposal
Methane Recovery (R)	0	IPCC default value

7.2.4. Description of any Flexibility Applied

Flexibility for the time series which starts from the year 1994 to 2022 is applied as described in Section 1.9.

7.2.5. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

7.2.6. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

7.2.7. Category-specific recalculations

The calculation of emissions from this category has been recalculated in this inventory for the years 2000 to 2020 due to the availability of more recent and accurate data.

Previous Methodology (Previous Submissions):

- In previous submissions, due to the lack of monitored data, municipal solid waste (MSW) generation in Solomon Islands was estimated based on the Provisional population count of 2019 National Population and Housing Census.
- For years 2011-2018, the MSW generation in Solomon Islands was estimated from the total population of the country and using average 0.97 kg/person/day and waste composition was taken from the Solid Waste management Plan (2018-2027), HCC (2019).

- While for 2019 & 2020, the MSW generation in Solomon Islands estimated from the total population of the country and using average 0.88 kg/person/day as per the report 'Cleaner Pacific 2025: Pacific Regional Waste and Pollution Management Strategy 2016-2025, Mid-term Review Report' published in 2022.

Current Methodology (This Inventory):

- The current inventory utilizes the per capita waste generation rate and MSW composition percentages as detailed in the Solomon Islands National Waste Audit Analysis Report (2023).
- Additionally, the total population data for Solomon Islands has been revised using information from the Solomon Islands National Population and Housing Census - Analytical Report Volume 2.

This updated methodology, incorporating data from the 2023 waste audit and the latest population census, provides a more accurate and reliable estimation of emissions from this waste category.

Implementing the changes in the current inventory caused estimated emissions from this category to decrease by 90% (-152.75 kt CO_2 eq) in 2000 and 91% (-307.19 kt CO_2 eq) in 2020 (see table 7.4 below).

Table 7.4: Comparison of the previous submission and current inventory for emissions from Solid Waste Disposal

Inventory Year	Previous Submission (kt CO_2 eq)	Current submission (kt CO_2 eq)	Change from previous submission (kt CO_2 eq)	% change
2000	168.90	16.15	-152.75	-90%
2005	194.93	18.84	-176.08	-90%
2010	202.59	21.92	-180.68	-89%
2011	325.89	22.46	-303.42	-93%
2012	333.95	23.03	-310.92	-93%
2013	341.97	23.62	-318.35	-93%
2014	349.94	24.22	-325.71	-93%
2015	340.63	25.84	-314.79	-92%
2016	348.12	26.55	-321.57	-92%
2017	355.60	27.29	-328.31	-92%
2018	363.06	28.06	-335.00	-92%
2019	328.16	28.86	-299.31	-91%
2020	336.87	29.69	-307.19	-91%

7.2.8. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

7.3. Wastewater Treatment and Discharge (CRT category 5.D)

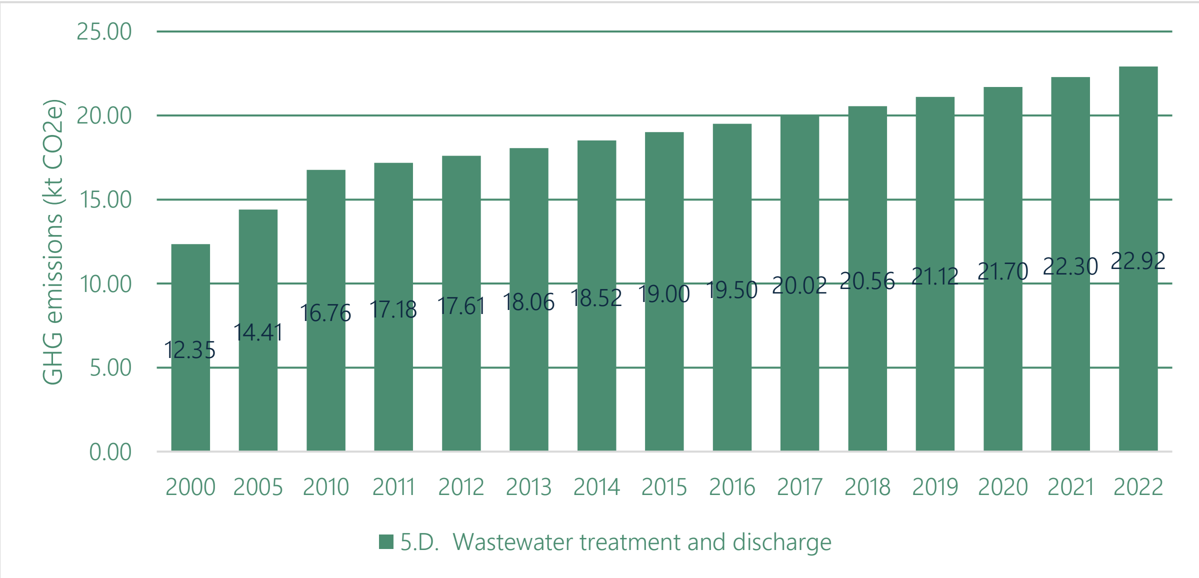
7.3.1 Category description

The anaerobic decomposition of organic matter in wastewater results in emissions of methane while chemical processes of nitrification and denitrification in wastewater treatment plants and discharge waters give rise to emissions of nitrous oxide.

In Solomon Islands, the wastewater generation form commercial activity is very limited and almost negligible/zero wastewater generation from industrial activities; hence main source of wastewater is domestic source. Methane is emitted from wastewater when it is handled anaerobically. The effluents may be treated on site (uncollected) and finally disposed of untreated/partially or fully treated into nearby environments (surface waters and marine disposals). Emissions from domestic wastewater are estimated for both urban and rural centres.

In 2022, the Wastewater treatment discharge category accounts for 22.92 kt CO_2 eq viz 42% of the sectoral emissions. Of which CH_4 (0.45 kt) and N_2O (0.04 kt) emissions are 55% and 45% respectively. Moreover, the GHG emissions from this category have increased by 85.6% during 2000 to 2022.

Figure 7.4: Wastewater treatment discharge GHG Emissions (kt CO_2 eq): 2000- 2022



7.3.2 Methodological issues

In this inventory, CH_4 emissions and indirect N_2O emissions from human wastewater were determined for the entire population of the country. CH_4 emissions from domestic wastewater, as well as N_2O emissions from human activity were estimated in accordance with the Tier 1 2006 IPCC Guidelines and default factors.

Total methane emissions from domestic wastewater were calculated using Equation 6.1-6.3 (pp. 6.11-6.13) of Vol. 5, Chapter 6 of the 2006 IPCC guidelines. These equations are also provided below.

It was assumed that the amount of organic component extracted as sludge in the accounting year S=0 (BOD kg/year) since there is no information on the collection of sludge. Also, due to the lack of practice of methane recovery from wastewater in the country, the amount of recovered methane in the reference year was assumed to be R=0 (kg/year).

While for estimating indirect nitrous oxides from treated wastewater discharges into the aquatic environment, equation 6.3 (pp. 6.13) of the Vol 5, Chapter 6 of the 2006 IPCC Guidelines was used and presented below (equation 7.6).

Equation for Total CH_4 emissions

$$CH_4\ emissions = \left[\sum_{i,j}(U_i \times T_{i,j} \times EF_j)\right] \times (TOW - S) - R \quad \text{(Equation 7.4)}$$

Where:

CH_4 Emissions = CH_4 emissions in inventory year, kg CH_4/yr

TOW = total organics in wastewater in inventory year, kg BOD/yr

S = organic component removed as sludge in inventory year, kg BOD/yr

U_i = fraction of population in income group i in inventory year, See Table 6.5.

$T_{i,j}$ = degree of utilisation of treatment/discharge pathway or system, j, for each income group

fraction i in inventory year,

i = income group: rural, urban high income and urban low income

j = each treatment/discharge pathway or system

EF_j =emission factor, kg CH_4 / kg BOD

R = amount of CH_4 recovered in inventory year, kg CH_4/yr

Equation for Emission factor (EF_j)

$$EF_j = Bo \times MCF_j \quad \text{(Equation 7.5)}$$

Where:

EFj = emission factor, kg CH_4/kg BOD

j = each treatment/discharge pathway or system

Bo = maximum CH_4 producing capacity, kg CH_4/kg BOD

MCFj = methane correction factor (fraction)

Equation for Total organically degradable material in domestic wastewater

$$TOW = P \times BOD \times 0.001 \times I \times 365 \quad \text{(Equation 6.6)}$$

Where:

TOW = total organics in wastewater in inventory year, kg BOD/yr

P = country population in inventory year, (person)

BOD = country-specific per capita BOD in inventory year, g/person/day

0.001 = conversion from grams BOD to kg BOD

I = correction factor for additional industrial BOD discharged into sewers

Activity data

To calculate CH_4 and N_2O emissions from domestic and commercial wastewater treatment and handling, the same human population data estimated for Solid waste disposal was used.

Emission factor

The emission factor and other factors used to calculate CH_4 emissions are presented in the table below.

Table 7.5: Emission Factor and other parameters used for estimating CH_4 from Wastewater treatment and discharge

Parameter	Value	Source
Correction factor for additional industrial BOD discharged into sewers (I)	1.25	Default value 1.25 for collected wastewater
Maximum CH_4 producing capacity, kg CH4/kg BOD (B_o)	0.60	Default value (0.6 kg CH4/kg BOD; 0.25 kg CH4/kg COD)
Methane correction factor (fraction) (MCF_j)	0.10	IPCC default value for Untreated system - Sea, river and lake discharge
Fraction of population in income group i in inventory year (U_i)	0.70	Sectoral expert judgement
Degree of utilization (ratio) of treatment/discharge pathway or system, j, for each income group fraction i in inventory year ($T_{i,j}$)	0.50	Sectoral expert judgement
Organic component removed as sludge in inventory year, S_i	0	Default value is 0
Amount of CH_4 recovered in inventory year, R_i	0	Default value is 0 All Default Values are as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 6: Wastewater

		Treatment and Discharge

The emission factor and other factors that were used to calculate N_2O emissions are presented in table 7.6 below.

Table 7.6: Emission Factor and other parameters used for estimating N_2O from Wastewater treatment and discharge

Parameter	Value	Source
Fraction of nitrogen in protein	0.16	IPCC default
Fraction of non-consumed protein, $F_{NON-CON}$	1.4	IPCC default
Fraction of industrial and commercial co-discharged protein into sewer system, $F_{IND-COM}$	1.25	IPCC default
Nitrogen removed with sludge (kg N.yr), N_{sludge}	0	IPCC default
Emission factor for N_2O emissions from discharged to wastewater in kg N_2O-N per kg N_2O	0.005	IPCC default
Emissions from wastewater treatment plants	0	IPCC default
Per capita protein consumption (kg/person/year)	22.63	

7.3.3 Description of any Flexibility Applied

Flexibility for the time series which starts from 1994 to 2023 is applied as described in Section 1.9.

7.3.4. Uncertainty assessment and time series consistency

Uncertainty assessment will be reported in Annex II: Uncertainty Assessment.

7.3.5. Category-specific QA/QC and verification

Compliant with QA/QC plan and implementation as outlined in Chapter 1, Section 1.5.

7.3.6. Category-specific recalculations

The calculation of emissions from this category has been recalculated in this inventory due to the availability of more recent and accurate data. The total population data for Solomon Islands has been revised using information from the Solomon Islands National Population and Housing Census - Analytical Report Volume 2.

This use of the latest population census provides a more accurate and reliable estimation of emissions from this category.

Implementing the changes in the current inventory caused estimated emissions from this category negligible change. (see table 7.7 below).

Table 7.7: Comparison of the previous submission and current inventory for emissions from Solid Waste Disposal

Inventory Year	Previous Submission (kt CO_2 eq)	Current submission (kt CO_2 eq)	Change from previous submission (kt CO_2 eq)	% change
2000	12.40	12.35	-0.05	0%
2005	14.32	14.41	0.09	-90%
2010	14.88	16.76	1.88	-89%
2011	16.68	17.18	0.50	-93%
2012	17.10	17.61	0.51	-93%
2013	17.51	18.06	0.55	-93%
2014	17.92	18.52	0.60	-93%
2015	18.32	19.00	0.68	-92%
2016	18.73	19.50	0.77	-92%
2017	19.13	20.02	0.89	-92%
2018	19.54	20.56	1.02	-92%
2019	21.13	21.12	-0.01	-91%
2020	21.74	21.70	-0.04	-91%

7.3.7. Category-specific planned improvements

This will be reported separately under the Inventory Improvement Plan section of the report.

National Inventory improvement plan

The improvement of the GHG inventory system follows a step wise approach. The institutional arrangement and the activity data collection, analysis and archiving system for GHG inventory is consistently reviewed and improved. Efforts would be concentrated on improving the disaggregation and completeness of the activity data according to the 2006 IPCC Guidelines and developing country specific emission factors for key categories for the next inventory cycle.

Over time with the improvement of data quality future inventory submissions, will focus on and robustness and accuracy. As a means of continuous improvement Solomon Islands will in the future, prioritize the adoption of Tier 2 or Tier 3 methodologies for key categories to ensure greater specificity and reliability in emissions estimation. Additionally, a detailed QA/QC (Quality Assurance/Quality Control) plan and standardized procedures will be developed to maintain data integrity throughout the inventory process. Emphasis will be placed on ensuring consistency in activity data and emission factors across the time series, thereby improving the comparability and transparency of historical trends. Furthermore, targeted efforts will be made to reduce uncertainty in emission estimates, particularly for key categories, through improved data collection and expert consultation.

Identified gaps	Improvement actions
Energy Sector	
Sectoral consumption is estimated based on the assumptions.	• Collect data on fuel consumption for activities in for all transport activities specified by sub-categories, commercial and institutional buildings, residential for the entire time series. • Implement an MRV system to continuously collect data from fuel suppliers on fuel sold to end-users.
Transport/ Land and marine transport	There is currently no integrated mechanism for collecting data on fuel usage by the transport sector (marine and land). Establish mechanisms to strengthen and improve collaboration between the relevant stakeholders on data and information sharing, including capacity building.
Statistics on the combustion of fuelwood are not available.	Assess the possibilities to improve statistics on fuelwood combustion, specially at households, to improve the estimates in category 1A4 of the inventory.
Industrial Processes and Product Use (IPPU) Sector	
Emissions from lubricant use are estimated based on assumptions.	Collect data on lubricant consumption for lubrication purposes split by the quantities of different types of lubricants for the entire time series.
Emissions from the use of hfc and pfc gases are estimated based on assumptions.	Collect data on total HFC and PFC imports and split between application area such as refrigeration and air conditioning, foam blowing and fire protection for the entire time series.
Data on food and beverages production is not available.	Regularly collect data on the quantity and alcoholic beverages and food production by type of product from companies to estimate NMVOC emissions.
Agriculture, Forestry, and Other Land Use (AFOLU) Sector	
Livestock census not conducted regularly.	Livestock census will be conducted on regular basis

Lack of information on N fraction in different Manure management systems (MMS)	Collect information on N fractions managed in different MMS
Data on actual quantity of urea and synthetic fertilizer applied to the soil not available. Data only on imports are available.	Collect data for urea and synthetic fertilizer applied on soil on regular basis from fertilizer suppliers.
Land-use change data estimated using assumptions.	• • Regular (annual basis) assessment of the land use based on satellite imagery will be done for various land use types, land management practices and inputs. • Improve data collection for commercial and firewood removals. • SOC dynamics under certain lad use, management practices and Inputs. • Develop system for monitoring the natural disturbance and prompt evidence.
Waste Sector	
Data from actual waste disposed in landfills not available.	Maintain accurate records of the quantity of waste deposited at all of Solomon Islands landfills and controlled dumps either through weighbridges or accounting for number of truckloads received at each site.
Emissions for healthcare waste incineration are not estimated.	Establish regular, standardized, and mandatory record-keeping and reporting of healthcare waste generation and treatment practices, including incineration.
Emissions from domestic wastewater treatment and discharge are estimated.	• Regularly collect data on the quantity and characteristics of domestic wastewater generated and treated on-site, including treatment systems implemented. • Establish a system for frequent and standardized BOD measurements specific to each wastewater treatment and discharge stream, including sewerage, septic systems, and latrines. • More information on type of wastewater treatment system and discharge pathway • Information on Sludge collection and management, methane recovery from solid waste disposal sites will be collected
Uncertainty assessment/ all sectors	Activity data uncertainty is not collected in any sector and therefore not estimated. IPCC default values are utilized instead. Provide sector specific trainings on how to collect data and information to establish uncertainty.
Baseline year adjustment and time series consistency	• Re-evaluate the GHGI baseline year to ensure it reflects data availability across all relevant sectors. • Solomon Islands utilizes 1994 as the baseline year, however 2000 or 2011 may be considered as the base year as this year marks the beginning of consistent and complete data availability across multiple sectors.

Annexures

Annex I: Key categories

A key category has a significant influence on a country's total inventory of direct greenhouse gases in terms of absolute level of emissions, the trend in emissions, or both. Solomon Islands has identified the key sources for the inventory using the tier 1 level and trend assessments as recommended in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006). This approach identifies sources that contribute to 95 per cent of the total emissions or 95 per cent of the trend of the inventory in absolute terms.

Approach 1 Level Assessment

Key Categories without LULUCF sector:

When the LULUCF sector is excluded in the analysis, Solomon Islands has identified the following sectors as the key categories in the order of their contribution to the total national GHG emissions:

- 3.B Manure Management
- 1.A.3.d Water-borne Navigation
- 1.A.3.b Road Transportation
- 5.A Solid Waste Disposal
- 1.A.1 Energy Industries
- 1.A.3.a Civil Aviation
- 3.A Enteric Fermentation
- 1.A.4 Other sector

The full results for the key source analysis excluding LULUCF are presented in the table below.

A	B	C	D	E	F	G
IPCC Category code	IPCC Category	Greenhouse gas	2022 Ex,t (kt CO_2 eq)	|Ex,t| (kt CO_2 eq)	Lx,t	Cumulative Total of Column F
3.B	Manure Management	METHANE (CH_4)	154.56	154.56	0.2679	0.268
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	130.60	130.60	0.2264	0.494

1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	93.69	93.69	0.1624	0.657
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	65.64	65.64	0.1138	0.771
5.A	Solid Waste Disposal	METHANE (CH_4)	31.44	31.44	0.0545	0.825
3.B	Manure Management	NITROUS OXIDE (N_2O)	24.35	24.35	0.0422	0.867
1.A.3.a	Civil Aviation	CARBON DIOXIDE (CO_2)	18.52	18.52	0.0321	0.899
5.D	Wastewater Treatment and Discharge	METHANE (CH_4)	12.60	12.60	0.0218	0.921
3.A	Enteric Fermentation	METHANE (CH_4)	11.18	11.18	0.0194	0.941
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	10.68	10.68	0.0185	0.959
5.D	Wastewater Treatment and Discharge	NITROUS OXIDE (N_2O)	10.32	10.32	0.0179	0.977
3.D	Agricultural soils	NITROUS OXIDE (N_2O)	6.74	6.74	0.0117	0.989
3.H	Urea application	CARBON DIOXIDE (CO_2)	1.91	1.91	0.0033	0.992
1.A.3.d	Water-borne Navigation	NITROUS OXIDE (N_2O)	1.86	1.86	0.0032	0.995
1.A.3.b	Road Transportation	NITROUS OXIDE (N_2O)	1.54	1.54	0.0027	0.998
2.D.1	Lubricant Use	CARBON DIOXIDE (CO_2)	0.49	0.49	0.0009	0.999
1.A.3.d	Water-borne Navigation	METHANE (CH_4)	0.19	0.19	0.0003	0.999
1.A.1	Energy Industries	NITROUS OXIDE (N_2O)	0.14	0.14	0.0002	0.999
1.A.3.a	Civil Aviation	NITROUS OXIDE (N_2O)	0.14	0.14	0.0002	1.000
1.A.3.b	Road Transportation	METHANE (CH_4)	0.14	0.14	0.0002	1.000
1.A.1	Energy Industries	METHANE (CH_4)	0.07	0.07	0.0001	1.000
1.A.4	Other Sectors	NITROUS OXIDE (N_2O)	0.01	0.01	0.0000	1.000
1.A.4	Other Sectors	METHANE (CH_4)	0.01	0.01	0.0000	1.000
1.A.3.a	Civil Aviation	METHANE (CH_4)	0.00	0.00	0.0000	1.000
2.F.1.	Refrigeration and air conditioning	HFCs	0.00	0.00	0.0000	1.000
Total						
			576.83	576.83	1.00	

Key categories with LULUCF sector:

When the LULUCF sector is included in the analysis, the most significant key categories are 4A1 Forest land remaining forest land. The results of this latter analysis are presented in the table below:

A	B	C	D	E	F	G
IPCC Category code	IPCC Category	Greenhouse gas	2022 Ex,t (kt CO_2 eq)	|Ex,t| (kt CO_2 eq)	Lx,t	Cumulative Total of Column F
4.A.1	Forest land remaining forest land	CARBON DIOXIDE (CO_2)	-31757.76	31757.76	0.9822	0.982
3.B	Manure Management	METHANE (CH_4)	154.56	154.56	0.0048	0.987
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	130.60	130.60	0.0040	0.991
1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	93.69	93.69	0.0029	0.994
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	65.64	65.64	0.0020	0.996
5.A	Solid Waste Disposal	METHANE (CH_4)	31.44	31.44	0.0010	0.997
3.B	Manure Management	NITROUS OXIDE (N_2O)	24.35	24.35	0.0008	0.998
1.A.3.a	Civil Aviation	CARBON DIOXIDE (CO_2)	18.52	18.52	0.0006	0.998
5.D	Wastewater Treatment and Discharge	METHANE (CH_4)	12.60	12.60	0.0004	0.999
3.A	Enteric Fermentation	METHANE (CH_4)	11.18	11.18	0.0003	0.999
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	10.68	10.68	0.0003	0.999
5.D	Wastewater Treatment and Discharge	NITROUS OXIDE (N_2O)	10.32	10.32	0.0003	1.000
3.D	Agricultural soils	NITROUS OXIDE (N_2O)	6.74	6.74	0.0002	1.000
3.H	Urea application	CARBON DIOXIDE (CO_2)	1.91	1.91	0.0001	1.000
1.A.3.d	Water-borne Navigation	NITROUS OXIDE (N_2O)	1.86	1.86	0.0001	1.000
1.A.3.b	Road Transportation	NITROUS OXIDE (N_2O)	1.54	1.54	0.0000	1.000
2.D.1	Lubricant Use	CARBON DIOXIDE (CO_2)	0.49	0.49	0.0000	1.000
1.A.3.d	Water-borne Navigation	METHANE (CH_4)	0.19	0.19	0.0000	1.000
1.A.1	Energy Industries	NITROUS OXIDE (N_2O)	0.14	0.14	0.0000	1.000
1.A.3.a	Civil Aviation	NITROUS OXIDE (N_2O)	0.14	0.14	0.0000	1.000
1.A.3.b	Road Transportation	METHANE (CH_4)	0.14	0.14	0.0000	1.000
1.A.1	Energy Industries	METHANE (CH_4)	0.07	0.07	0.0000	1.000
1.A.4	Other Sectors	NITROUS OXIDE (N_2O)	0.01	0.01	0.0000	1.000
1.A.4	Other Sectors	METHANE (CH_4)	0.01	0.01	0.0000	1.000
1.A.3.a	Civil Aviation	METHANE (CH_4)	0.00	0.00	0.0000	1.000
2.F.1.	Refrigeration and air conditioning	HFCs	0.00	0.00	0.0000	1.000
Total						

			-31180.93	32334.60	1.00	

Approach 1 Trend Assessment

Key categories without the LULUCF sector:

When the LULUCF sector is excluded in the analysis, the most significant key categories identified are as follows. The results of this latter analysis are presented in the table below:

- 1.A.3.b Road Transportation
- 1.A.3.d Water-borne Navigation
- 1.A.4 Other Sectors
- 1.A.1 Energy Industries

A	B	C	D		E	F	G	|F-G|	E x |F-G|		
IPCC Category code	IPCC Category	Greenhouse gas	1994 Year Estimate Ex0 (kt CO_2 eq)	2022 Year Estimate Ext (kt CO_2 eq)	|Ex0|/Σ|Ey0|	(Ext-Ex0)/|Ex0|	(ΣEyt-ΣEy0)/|ΣEy0|		Trend Assessment Txt	% Contribution to Trend	Cumulative Total
1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	192.85	93.69	0.645	-0.514	0.931	1.445	0.933	52%	52%
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	0.00	130.60	0.000	51770.888	0.931	51769.957	0.437	24%	76%
1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	48.61	10.68	0.163	-0.780	0.931	1.711	0.278	15%	92%
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	53.68	65.64	0.180	0.223	0.931	0.708	0.127	7%	99%
1.A.3.b	Road Transportation	NITROUS OXIDE (N_2O)	2.99	1.54	0.010	-0.485	0.931	1.416	0.014	1%	99%
1.A.3.d	Water-borne Navigation	NITROUS OXIDE (N_2O)	0.00	1.86	0.000	332226.635	0.931	332225.704	0.006	0%	100%
1.A.3.b	Road Transportation	METHANE (CH_4)	0.28	0.14	0.001	-0.504	0.931	1.435	0.001	0%	100%
1.A.3.d	Water-borne Navigation	METHANE (CH_4)	0.00	0.19	0.000	65052.736	0.931	65051.805	0.001	0%	100%
1.A.4	Other Sectors	NITROUS OXIDE (N_2O)	0.10	0.01	0.000	-0.922	0.931	1.852	0.001	0%	100%
1.A.4	Other Sectors	METHANE (CH_4)	0.09	0.01	0.000	-0.931	0.931	1.861	0.001	0%	100%
1.A.1	Energy Industries	NITROUS OXIDE (N_2O)	0.12	0.14	0.000	0.223	0.931	0.708	0.000	0%	100%
1.A.1	Energy Industries	METHANE (CH_4)	0.06	0.07	0.000	0.223	0.931	0.708	0.000	0%	100%
1.A.3.a	Civil Aviation	CARBON DIOXIDE (CO_2)	0.00	18.52	0.000	0.000	0.000	0.000	0.000	0%	100%
1.A.3.a	Civil Aviation	METHANE (CH_4)	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0%	100%

1.A.3.a	Civil Aviation	NITROUS OXIDE (N_2O)	0.00	0.14	0.000	0.000	0.000	0.000	0.000	0%	100%
2.D.1	Lubricant Use	CARBON DIOXIDE (CO_2)	0.00	0.49	0.000	0.000	0.000	0.000	0.000	0%	100%
2.F.1.	Refrigeration and air conditioning	HFCs	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0%	100%
3.A	Enteric Fermentation	METHANE (CH_4)	0.00	11.18	0.000	0.000	0.000	0.000	0.000	0%	100%
3.B	Manure Management	METHANE (CH_4)	0.00	154.56	0.000	0.000	0.000	0.000	0.000	0%	100%
3.B	Manure Management	NITROUS OXIDE (N_2O)	0.00	24.35	0.000	0.000	0.000	0.000	0.000	0%	100%
3.H	Urea application	CARBON DIOXIDE (CO_2)	0.00	6.74	0.000	0.000	0.000	0.000	0.000	0%	100%
3.D	Agricultural soils	CARBON DIOXIDE (CO_2)	0.00	1.91	0.000	0.00	0.000	0.000	0.000	0%	100%
5.A	Solid Waste Disposal	METHANE (CH_4)	0.00	31.44	0.000	0.000	0.000	0.000	0.000	0%	100%
5.D	Wastewater Treatment and Discharge	METHANE (CH_4)	0.00	12.60	0.000	0.000	0.000	0.000	0.000	0%	100%
5.D	Wastewater Treatment and Discharge	NITROUS OXIDE (N_2O)	0.00	10.32	0.000	0.000	0.000	0.000	0.000	0%	100%
Total			Ey0	Eyt							
	Total GHG Emissions, excl. removals		298.77	576.83					105.382		

Key categories with the LULUCF sector:

When the LULUCF sector is included in the analysis, the most significant key categories identified are as follows. The results of this latter analysis are presented in the table below:

- 1.A.3.b Road Transportation
- 1.A.1 Energy Industries
- 1.A.4 Other Sectors

A	B	C	D		E	F	G	|F-G|	E x |F-G|		
IPCC Category code	IPCC Category	Greenhouse gas	1994 Year Estimate Ex0 (kt CO_2 eq)	2022 Year Estimate Ext (kt CO_2 eq)	|Ex0|/Σ|Ey0|	(Ext-Ex0)/|Ex0|	(ΣEyt-ΣEy0)/|ΣEy0|		Trend Assessment Txt	% Contribution to Trend	Cumulative Total
1.A.3.b	Road Transportation	CARBON DIOXIDE (CO_2)	192.85	93.69	0.645	-0.514	-105.363	104.848	67.677	64%	64%
1.A.1	Energy Industries	CARBON DIOXIDE (CO_2)	53.68	65.64	0.180	0.223	-105.363	105.586	18.969	18%	82%

1.A.4	Other Sectors	CARBON DIOXIDE (CO_2)	48.61	10.68	0.163	-0.780	-105.363	104.582	17.015	16%	98%
1.A.3.b	Road Transportation	NITROUS OXIDE (N_2O)	2.99	1.54	0.010	-0.485	-105.363	104.877	1.048	1%	99%
1.A.3.d	Water-borne Navigation	CARBON DIOXIDE (CO_2)	0.00	130.60	0.000	51770.888	-105.363	51876.251	0.438	0%	100%
1.A.3.b	Road Transportation	METHANE (CH_4)	0.28	0.14	0.001	-0.504	-105.363	104.858	0.098	0%	100%
1.A.1	Energy Industries	NITROUS OXIDE (N_2O)	0.12	0.14	0.000	0.223	-105.363	105.585	0.041	0%	100%
1.A.4	Other Sectors	NITROUS OXIDE (N_2O)	0.10	0.01	0.000	-0.922	-105.363	104.441	0.035	0%	100%
1.A.4	Other Sectors	METHANE (CH_4)	0.09	0.01	0.000	-0.931	-105.363	104.432	0.031	0%	100%
1.A.1	Energy Industries	METHANE (CH_4)	0.06	0.07	0.000	0.223	-105.363	105.585	0.022	0%	100%
1.A.3.d	Water-borne Navigation	NITROUS OXIDE (N_2O)	0.00	1.86	0.000	332226.635	-105.363	332331.998	0.006	0%	100%
1.A.3.d	Water-borne Navigation	METHANE (CH_4)	0.00	0.19	0.000	65052.736	-105.363	65158.098	0.001	0%	100%
1.A.3.a	Civil Aviation	CARBON DIOXIDE (CO_2)	0.00	18.52	0.000	0.000	0.000	0.000	0.000	0%	100%
1.A.3.a	Civil Aviation	METHANE (CH_4)	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0%	100%
1.A.3.a	Civil Aviation	NITROUS OXIDE (N_2O)	0.00	0.14	0.000	0.000	0.000	0.000	0.000	0%	100%
2.D.1	Lubricant Use	CARBON DIOXIDE (CO_2)	0.00	0.49	0.000	0.000	0.000	0.000	0.000	0%	100%
2.F.1.	Refrigeration and air conditioning	HFCs	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0%	100%
3.A	Enteric Fermentation	METHANE (CH_4)	0.00	11.18	0.000	0.000	0.000	0.000	0.000	0%	100%
3.B	Manure Management	METHANE (CH_4)	0.00	154.56	0.000	0.000	0.000	0.000	0.000	0%	100%
3.B	Manure Management	NITROUS OXIDE (N_2O)	0.00	24.35	0.000	0.000	0.000	0.000	0.000	0%	100%
3.H	Urea application	NITROUS OXIDE (N_2O)	0.00	6.74	0.000	0.000	0.000	0.000	0.000	0%	100%
3.D	Agricultural soils	CARBON DIOXIDE (CO_2)	0.00	1.91	0.000	0.00	0.000	0.000	0.000	0%	100%
4.A.1	Forest land remaining forest land	CARBON DIOXIDE (CO_2)	0.00	-31757.76	0.000	0.00	0.000	0.000	0.000	0%	100%
5.A	Solid Waste Disposal	METHANE (CH_4)	0.00	31.44	0.000	0.000	0.000	0.000	0.000	0%	100%
5.D	Wastewater Treatment and Discharge	METHANE (CH_4)	0.00	12.60	0.000	0.000	0.000	0.000	0.000	0%	100%
5.D	Wastewater Treatment and Discharge	NITROUS OXIDE (N_2O)	0.00	10.32	0.000	0.000	0.000	0.000	0.000	0%	100%
Total			Ey0	Eyt					0.000	0%	
	Total GHG Emissions, including removals		298.77	-31180.93					105.382		

Annex II: Uncertainty

IPCC category	Gas	Base year emissions (1994)	2022 emissions	AD uncertainty	EF uncertainty	Combined uncertainty	Contribution to variance by category in year 2022	Type A sensitivity	Type B sensitivity	Uncertainty in trend by EF	Uncertainty in trend by AD	Uncertainty introduced into the trend in total national emissions
		kt of CO2-eq		%	%	%		%	%	%	%	%
1A1 – Energy Industries	CO_2	53.68	65.64	10	7	12	0.001	18.907	0.220	132.348	2.197	17520.774
1A1 – Energy Industries	CH_4	0.06	0.07	10	100	100	0.000	0.021	0.000	2.147	0.002	4.611
1A1 – Energy Industries	N_2O	0.12	0.14	10	100	100	0.000	0.041	0.000	4.065	0.005	16.521
1A3a – Domestic Aviation	CO_2	0.00	18.52	10	7	12	0.000	0.062	0.062	0.434	0.620	0.573
1A3a – Domestic Aviation	CH_4	0.00	0.00	10	100	100	0.000	0.000	0.000	0.001	0.000	0.000
1A3a – Domestic Aviation	N_2O	0.00	0.14	10	100	100	0.000	0.000	0.000	0.047	0.005	0.002
1A3b – Road Transport	CO_2	192.85	93.69	10	7	12	0.001	67.141	0.314	469.986	3.136	220896.561
1A3b – Road Transport	CH_4	0.28	0.14	10	100	100	0.000	0.098	0.000	9.829	0.005	96.616
1A3b – Road Transport	N_2O	2.99	1.54	10	100	100	0.000	1.046	0.005	104.637	0.051	10948.826
1A3d – Domestic Navigation	CO_2	0.00	130.60	10	7	12	0.003	0.438	0.437	3.066	4.371	28.506
1A3d – Domestic Navigation	CH_4	0.00	0.19	10	100	100	0.000	0.001	0.001	0.065	0.006	0.004
1A3d – Domestic Navigation	N_2O	0.00	1.86	10	100	100	0.000	0.006	0.006	0.624	0.062	0.393
1A4 – Other Sectors	CO_2	48.61	10.68	25	7	26	0.000	16.961	0.036	118.729	0.894	14097.483
1A4 – Other Sectors	CH_4	0.09	0.01	25	100	103	0.000	0.031	0.000	3.141	0.001	9.864
1A4 – Other Sectors	N_2O	0.10	0.01	25	100	103	0.000	0.035	0.000	3.522	0.001	12.406
2D1 – Lubricant Use	CO_2	0.00	0.49	10	7	12	0.000	0.002	0.002	0.012	0.016	0.000
2F1- Refrigeration and air conditioning	HFC	0.00	0.00	10	20	22	0.000	0.000	0.000	0.000	0.000	0.000

3A – Enteric fermentation	CH_4	0.00	11.18	20	40	45	0.000	0.037	0.037	1.497	0.748	2.801
3B – Manure management	CH_4	0.00	154.56	20	30	36	0.032	0.517	0.517	15.519	10.346	347.886
3B – Manure management	N_2O	0.00	24.35	54	116	128	0.010	0.082	0.082	9.454	4.401	108.758
3H – Urea application	CO_2	0.00	6.74	100	50	112	0.001	0.023	0.023	1.129	2.257	6.369
3D – Agricultural soils	N_2O	0.00	1.91	101	242	262	0.000	0.006	0.006	1.544	0.644	2.797
4A1 – Forest Land Remaining Forest Land	CO_2	0.00	-31757.76	21	70	73	5557.435	-106.293	106.293	-7440.532	2232.160	60344059.518
5A- Managed Waste Disposal Sites	CH_4	0.00	79.99	52	52	73	0.035	0.268	0.268	13.839	13.912	385.046
5D – Domestic Wastewater Treatment and Discharge	CH_4	0.00	12.14	59	58	83	0.001	0.041	0.041	2.369	2.387	11.311
5D – Domestic Wastewater Treatment and Discharge	N_2O	0.00	9.95	58	497	500	0.026	0.033	0.033	16.550	1.940	277.666

		299	-31133				74.55					7785.17
		Total 2011 emissions	Total 2022 emissions				2022 inventory uncertainty (%)					2011-2022 trend uncertainty (%)

Annex III: Detailed description of the reference approach (including inputs to the reference approach such as the national energy balance) and the results of the comparison of national estimates of emissions with those obtained using the reference approach

The reference approach estimates CO_2 emissions from fuel combustion activities using the 2006 IPCC guidelines. Under the reference approach, GHG emissions were estimated using only the fuel consumption data for each type of fuel. The data received from the Solomon Islands National Statistics Office (SINSO), Customs department and Fuel suppliers is compared against the sectoral fuel data provided by the Energy division.

The difference in estimates of CO_2 emissions from fuel combustion using the sectoral and reference approaches was within ±1%.

Inventory Year	REFERENCE APPROACH			SECTORAL APPROACH		DIFFERENCE	
	Apparent energy consumption (PJ)	Apparent energy consumption (excluding non-energy use, reductants and feedstocks) (PJ)	CO_2 emissions (PJ)	Energy consumption (PJ)	CO_2 emissions (PJ)	Energy consumption (%)	CO_2 emissions (%)
1994	4.42	4.42	323.03	4.04	295.14	9.47	9.45
2000	2.28	2.28	163.91	2.19	159.54	4.36	2.74
2005	2.66	2.66	189.79	2.65	192.99	0.45	-1.66
2010	4.25	4.25	285.15	4.20	302.78	1.10	-5.82
2011	4.52	4.52	328.62	4.49	329.74	0.70	-0.34
2012	4.95	4.95	358.73	4.92	359.82	0.62	-0.30
2013	5.46	5.46	391.66	5.41	393.22	0.84	-0.40
2014	4.41	4.41	319.06	4.38	320.17	0.72	-0.35
2015	4.22	4.22	304.49	4.19	305.39	0.61	-0.30
2016	5.17	5.17	373.32	5.15	374.24	0.49	-0.25
2017	5.16	5.16	370.76	5.13	371.95	0.66	-0.32
2018	4.98	4.98	358.61	4.96	359.31	0.37	-0.19
2019	5.20	5.20	374.99	5.20	376.71	0.00	-0.46
2020	5.45	5.45	391.02	5.45	394.33	0.00	-0.84
2021	5.04	5.04	366.36	5.03	366.48	0.27	-0.03
2022	4.41	4.41	319.02	4.38	319.13	0.77	-0.03

Annex IV: Common reporting tables

Provided in separate Excel files as per the latest CRT_2.83 format of UNFCCC's MPGs.

III. Information Necessary to Track Progress Made in Implementing and achieving Nationally Determined Contributions Under Article 4 of Paris Agreement

National circumstances and institutional arrangements

The National Circumstances and Institutional Arrangements of the Government of Solomon Islands has been detailed in the Chapter 1 of the Biennial Transparency Report (BTR) giving information about the government structure, demographic profile, geographical profile, economic profile, climate profile, and priority sector details.

Solomon Islands' national circumstances significantly influence its greenhouse gas (GHG) emissions over time due to factors such as its geography, energy infrastructure, economic dependence on natural resources, population growth, and vulnerability to climate change. Below is an overview of some of the key factors:

1. Geographical and Climatic Factors

The Solomon Islands is an archipelagic Small Island Developing State (SIDS) comprising nearly 1,000 islands, making infrastructure development and service delivery (e.g., electricity, transportation) logistically challenging. The country is highly vulnerable to the impacts of climate change, including sea-level rise, coastal erosion, cyclones, and flooding. These extreme events can disrupt energy supply chains, agricultural activities, and livelihoods, leading to variations in sectoral emissions over time. Vulnerability to disasters also drives emissions indirectly by increasing demand for reconstruction materials and services post-disaster.

2. Economic Activities and Development

The Solomon Islands' A narrow economic base heavily dependent on natural resource extraction (forestry, agriculture, fisheries) and foreign aid. Around 80% of the population relies on subsistence agriculture and fishing for livelihoods. Logging is a significant revenue source but also a driver of environmental degradation. Urbanization and infrastructure development are increasing energy demand, leading to higher emissions in the energy sector.

3. Energy Use and Dependency on Fossil Fuels

Energy access is limited and uneven, with around 85% of the population lacking access to grid electricity. In urban areas, electricity is predominantly generated from imported diesel fuel, making the energy sector a key source of emissions. The Solomon Islands is highly dependent on fossil fuel imports, which are costly and expose the economy to international price volatility. Economic development, increasing mobility, and efforts to expand energy access drive demand, potentially increasing emissions unless a significant shift to renewables occurs. Planned projects like the Tina River Hydropower Plant are crucial mitigation steps. The government's National

Climate Change Policy (2023–2032) and Long-Term Low Emission Development Strategy (LT-LEDS) aim to expand renewable energy sources (solar, hydro, and bioenergy) to reduce GHG emissions and enhance energy security.

4. Population Growth and Urbanization

The country's population is growing at a rate of about 2.3% per year, contributing to increased demand for food, energy, housing, and transportation. Urbanization—especially in Honiara—has led to increased electricity consumption, vehicular traffic, and waste generation, all of which contribute to GHG emissions. Population growth also drives land-use changes, such as deforestation for agriculture and settlements, further impacting the country's emissions profile.

5. Land Use Change and Forestry

Forestry is both an economic mainstay and a major emissions source. Extensive forest cover acts as a major carbon sink (LULUCF sector). However, commercial logging poses a significant threat through deforestation and land degradation. The Solomon Islands is exploring REDD+ and other forest conservation initiatives to mitigate these impacts and enhance carbon stock preservation.

6. Waste and Wastewater

Waste management is an emerging challenge, particularly in urban areas. Inadequate solid waste disposal and wastewater treatment infrastructure lead to GHG emissions, especially methane (CH_4) from open dumping and unmanaged landfills. Rapid population growth and urban expansion exacerbate these challenges, highlighting the need for investment in sustainable waste management systems.

As an LDC and SIDS, the Solomon Islands confronts significant financial and technical capacity constraints. The successful implementation of the policies and mitigation measures are heavily contingent on international support, will determine the future emissions trajectory.

In accordance with Decision 18/CMA.1, annex, paragraph 62 the Government of Solomon Islands has an institutional, administrative and procedural arrangements for domestic implementation, monitoring, reporting achievement of the NDC targets.

The Ministry of Environment Climate change Disaster management and Meteorology (MECDM) is the national nodal agency responsible for sustainable environmental management, climate change adaptation and mitigation, disaster risk management and meteorological services for the Solomon Islands. The Ministry is organized into four technical divisions that look after each of the technical areas, namely environment and conservation, climate change, disaster management, meteorology.

Few of the other key institutions and stakeholders are involved in NDC implementation:

- Climate Change Division (CCD) and National Disaster Management Office (NDMO) were brought together under the MECDM to facilitate closer coordination on climate change, disaster risk reduction and disaster management work. The MECDM undertakes all the climate change mitigation sector and activities in the country (except the forestry sector) and act as focal point to the UNFCCC for reporting.
- Ministry of Forestry and Research (MoFR) acts as a nodal agency for the Forestry sector. It initiated the National REDD+ Programme with the aim of improving forest governance and shifting to a more sustainable management of its forest resources. REDD+ Implementation Unit (RIU) of the MoFR is the government body responsible for the coordination of the Solomon Islands National REDD+ Programme. The key functions of the RIU are to: (1) Lead REDD+ Implementation within Solomon Islands; (2) Organize awareness raising events and consultation meetings with stakeholders; (3) Provide Training on REDD+ to relevant stakeholders on REDD+ issues; (4) Act as the secretariat to the National REDD+ Committee (NRC); (5) Develop and implement the Solomon Islands' National Monitoring System; and (6) Report to the CCD of the MECDM on forest carbon stocks and emissions
- Ministry of Mines, Energy and Rural Electrification through the Energy Division is responsible for energy policy, renewable energy development and project implementation. The Energy Division also has legal and regulatory supervision of the state-owned utility, the Solomon Islands Electricity Authority (SIEA), trading as Solomon Power (SP).
- Solomon Islands Electricity Authority is a state-owned enterprise established to provide electricity services in urban areas of the country, currently Honiara and nine provincial centres: Auki, Kirakira, Lata, Tulagi, Buala, Gizo, Malu'u and Noro in Western Province. SIEA is responsible for planning, developing, operating and maintaining the electricity supply system and for delivering electrical energy of appropriate quality and reliability in accordance with its financial, safety environmental and other statuary obligations.

Solomon Islands Monitoring, Reporting and Verification (MRV) Framework

In 2024, the Solomon Islands launched an Integrated Monitoring, Reporting, and Verification (iMRV) tool designed to enhance its capacity for tracking and reporting climate-related data and actions. Developed in partnership with the United Nations Development Programme (UNDP) and with financial support from the Australian Government, this tool is specifically aligned with the requirements of the Enhanced Transparency Framework (ETF) under the Paris Agreement. The iMRV tool directly supports the Solomon Islands Government in fulfilling its international climate commitments and reporting obligations under the UNFCCC and the Paris Agreement, particularly the provisions of the ETF.

The iMRV tool is built around six key modules:

- Greenhouse Gas (GHG) Inventory Module

- Adaptation Module
- Mitigation Module
- Support Needed and Received Module (Refined name for clarity)
- Sustainable Development Goals (SDGs) Tracking Module
- Administration and User Management Module

This comprehensive iMRV system enhances the government's ability to systematically manage the National GHG inventory, monitor progress on mitigation and adaptation actions, track climate finance and other Means of Implementation (MOI) received, and assess the linkages and contributions towards achieving the goals outlined in the National Development Strategy for the Solomon Islands and the global Sustainable Development Goals (SDGs).

Description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates

Solomon Islands submitted its Intended Nationally Determined Contribution (INDC) to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), in accordance with decision 1/CP.20 (Lima Action Plan), in 2015, prior to the twenty-first session of the Conference of the Parties (COP21). Following the ratification of the Paris Agreement the INDC was converted to Nationally Determined Contribution (NDC) and submitted to the UNFCCC secretariat in 2016.

In accordance with Articles 4.2 and 4.11 of the PA and decision CP.21, paragraphs 23 and 24, of the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC) and Article 4 of the Paris Agreement, Solomon Islands updated its NDC with a view to making a progression beyond its initial NDC. The updated NDC highlights its ambitious mitigation contribution along with adaptation targets to ensure resilience of its communities and ecosystems now and in the future.

Solomon Islands Nationally Determined Contribution for Climate Change

Solomon Islands is a party to the UNFCCC and ratified the global climate change agreements i.e., Kyoto protocol and Paris Agreement. The SIG submitted its enhanced and updated NDC in 2021, which is guiding document for mitigation initiatives and actions in the country. In its INDC which was later converted to the first NDC 2016, SIG has committed to reduce emissions by 12% below 2015 level by 2025 and 30% below 2015 level by 2030 compared to a business-as-usual projection (BaU). In addition to the carbon storage in the forest, coastal and marine ecosystems Solomon Islands unconditional contribution will reduce 8,300 tCO_2 eq annually and the conditional contribution will reduce emissions by 2025, and 31,125 tCO_2 eq annually by 2030. In its NDC 2021, Solomon Islands committed to reduce its emissions by 14% by 2025 below 2015 and by 33% below 2015 by 2030 compared to a business-as-usual projection. Further, committed to an unconditional contribution to reduce emissions by 6,770.8 tCO2e annually.

The updated NDCs identified the energy sector as a key mitigation action, and energy policy has been changed to increase energy access, private sector participation and foreign investment, and to create fiscal incentives for improving energy access, efficiency and activities that will contribute to expanding the economic base. The policy objective is to increase electricity access and use through renewable energy resources and technologies to 100% by 2050.

The updated NDC also highlights the planned mitigation activities and actions that have not been implemented as yet:

- Establishment of national climate change trust fund
- Quantification of carbon sequestration potential of forests above 400m contour
- Mitigation actions of sea and land transport sectors
- Fiu Hydropower (on hold), solar homes, mini hydro and energy usage (as conditional contribution)
- Six planned hydropower systems are now included as conditional measures
- Afio solar PV, Kakabona solar PV and Savo Geothermal are now included as conditional measures

The 2021 NDC does not include mitigation actions in the waste sector (solid waste and manure management) or specific mitigation targets for land transport or forest carbon sequestration. However, it does indicate policy initiatives to take action, quantify forest carbon sequestration, and protect forests..

The 2021 NDC highlights several macro-level adaption actions in policy, planning, and information strengthening that reflect the key areas of the National Adaptation Programme of Action (NAPA). NAPA includes qualitative objectives for priority areas for adaptation actions in waste management, infrastructure development, tourism, coastal protection, fisheries and marine resources (incl. forestry).

Table 1: Description of Solomon Islands NDC

Target(s) and description, including target type(s), as applicable	• Unconditional Targets: Reduce GHG emissions by 14% by 2025 and 33% by 2030 below 2015 levels, compared to a Business-as-Usual (BaU) scenario. • Conditional Targets (with international support): Additional 27% reduction by 2025 and 45% by 2030 below 2015 BaU levels. • Long-Term Goal: Achieve net-zero emissions by 2050 with adequate international assistance. •Target Type: Economy-wide emissions reduction relative to BaU projections.
Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable	• 2025 and 2030 targets are set as single-year targets. • Implementation is structured in five-year periods starting from 2020.
Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s), as applicable	• Base Year: 2015. • BaU Projection: Based on extrapolation of fossil fuel consumption data from 1994 to 2010. • Estimated Emissions Reductions: - Unconditional: ~6,770.8 tCO_2 eq annually. - Conditional: ~55,347.31 tCO_2 eq annually by 2025 and ~246,793.73 tCO_2 eq annually by 2030.

Time frame(s) and/or periods for implementation, as applicable	Five-year periods starting 2020, with reference to 2025 and ending in 2030.
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable	• Sectors: - Energy: Electricity generation (39%) and transport (sea and land) (61%). - Agriculture, Forestry, and Land Use (AFOLU). - Coastal and Marine Ecosystems. • Gases: Primarily carbon dioxide (CO_2), accounting for over 95% of emissions. • Sources and Sinks: - Sources: Combustion of imported fossil fuels. - Sinks: Forest carbon sequestration and coastal/marine ecosystems. • Geographical Coverage: Entire national territory.
Intention to use cooperative approaches that involve the use of ITMOs under Article 6 towards NDCs under Article 4 of the Paris Agreement, as applicable	Solomon Islands will consider other avenues as well as market-based mechanisms to support establishment and operation of a National Climate Change Trust Fund. Solomon Islands intends to use the market and non-market mechanisms under Article 6 of the Paris Agreement.
Any updates or clarifications of previously reported information, as applicable	• Enhanced Ambition: Increased unconditional targets from 12% to 14% by 2025 and from 30% to 33% by 2030 compared to the initial NDC. • Expanded Scope: Inclusion of additional mitigation actions such as the development of hydropower and solar photovoltaic systems. • Implementation Challenges: Acknowledgment of challenges in achieving certain INDC/NDC components, including the establishment of a national climate change trust fund and comprehensive GHG inventory updates. • Gender Integration: Commitment to integrating gender considerations into the planning and implementation of mitigation actions.

IV. Information necessary to track progress made in implementing and achieving the nationally determined contribution under Article 4 of the Paris Agreement

In accordance with the modalities, procedures, and guidelines (MPGs) of the Enhanced Transparency Framework (ETF) under the Paris Agreement, the Solomon Islands has identified absolute greenhouse gas (GHG) emission reductions (in kilo tonnes of CO_2 equivalent – kt CO_2 eq) as the primary indicator for tracking progress towards the implementation and achievement of its Nationally Determined Contribution (NDC) under Article 4. Table 42 detail the indicators selected to monitor progress in implementing and achieving these mitigation targets of Solomon Islands NDC.

Table 2: Indicators selected to monitor progress in implementing and achieving these mitigation targets of Solomon Islands NDC

Target Indicator	2015 (Base Year)	2024 (Status)	2025 (Target)	2030 (Target)
Total National GHG Emissions (Excluding LULUCF) – kt CO_2 eq	519.02 kt CO_2 eq	Not estimated	Unconditional: 14% reduction from 2015 levels; Conditional: Additional 27% reduction from BaU	Unconditional: 33% reduction from 2015 levels; Conditional: Additional 45% reduction from BaU
Renewable Energy Generation – Grid Connected (% of Honiara Grid)	Approximately 2%	Not estimated	Not specified	100%
Access to Electricity (% of Population)	Approximately 16%	Approximately 76%	Urban: 80%; Rural: 40%	Not specified
Energy Efficiency Improvement Across All Sectors (%)	Baseline not specified	Not estimated	Not specified	10% improvement
Share of Renewable Energy in Urban and Rural Electricity Generation (%)	Approximately 1%	Not estimated	Not specified	50%

Methodologies and Accounting Approaches

The Solomon Islands accounts for its anthropogenic GHG emissions and removals in alignment with the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories. This approach ensures consistency, comparability, and transparency in GHG accounting across all relevant sectors and gases covered under the NDC.

Assessment of Achievement of NDC targets

The Solomon Islands has made notable progress toward the implementation of its NDC, particularly in strengthening institutional frameworks, initiating renewable energy investments, and maintaining a net-negative emissions profile through forest carbon sinks. However, it remains significantly behind its commitments. Key barriers include:

- Limited access to climate finance
- Insufficient technical and institutional capacity
- Challenges in technology deployment and infrastructure development

Accelerated progress toward NDC achievement will require enhanced international support, particularly in the areas of climate finance, technology development and transfer, and capacity-building initiatives, as articulated in the Solomon Islands' NDC and Low Emission Development Strategy (LEDS).

Mitigation policies and measures, actions and plans related to implementing and achieving a nationally determined contribution under Article 4 of the Paris Agreement

The Solomon Island updated NDC 2021, aligns with the country's vision and long term national, regional and international policies and strategies including the following:

Long-Term Low Emissions Development Strategy (LEDS)

The Government of Solomon Islands developed its Low Emissions Development Strategy (LEDS) in 2023. Solomon Islands LEDS provides a vision and a pathway for Solomon Islands to achieve its national economic, environmental, and social goals over the long term. This LEDS provides a pathway towards a low emission, equitable and resilient development vision for Solomon Islands by 2050. The pathway is comprised of a 2050 emissions pathway, and steps. The steps move Solomon Islands from a Business-As-Usual (BAU) pathway to the low emissions, equitable growth, and resilience pathway. Within the domestic context, the LEDS serves to complement and support existing short- and medium-term strategies such as the National Development Strategy 2016–2035, sector strategies such as the National Forest Policy 2020, as well as cross-cutting strategies such as the National Climate Change Policy (NCCP). The LEDS captures development opportunities across sectors and over the long term, it provides an opportunity to identify pathway actions with benefits across sectors, or over a longer period that might otherwise not feature in the short- and medium- term strategies. Whereas in International context, the LEDS supports international climate action under the Paris Agreement. Through publication of the LEDS, Solomon Islands meets its obligations under Article 4, Paragraph 19, of the Paris Agreement to formulate and communicate long-term low GHG emission development strategies.

Eighteen steps from six emitting sectors were identified and prioritised to put Solomon Islands on a pathway to low emissions, equitable economic growth and resilience in line with the vision. A further four steps were identified for enabling institutions that span multiple sectors. All steps are outlined in Table 3.

Table 3: Summary of steps identified to transition Solomon Islands to a low emission, equitable growth and resilient pathway

Energy	
1.1	Increase renewable energy generation, particularly from hydropower and solar.
1.2	Mobilize international and domestic funds for rural electrification.
1.3	Establish a regulatory framework to enable Independent Power Producers (IPPs).
Transport	
2.1	Improve land transport efficiency.
2.2	Introduce electric vehicles and charging infrastructure.
2.3	Improve measurement and efficiency of maritime transport.
2.4	Introduce zero emissions technology and infrastructure for maritime transport.
Forestry & Land	
3.1	Reduce the rate of forest clearing through tighter regulations on access or logging practices.
3.2	Increase forest area protected under the Protected Area Act 2010.
3.3	Implement community volunteer and private managed forest programs.
3.4	Undertake reafforestation programs to replant degraded and previously logged areas with native forest.
3.5	Focus on mangrove replanting and land reclamation for carbon conservation.
Agriculture	
4.1	Support organic agriculture to avoid inorganic fertilizer use and Persistent Organic Pollutants (PoPs).
	Implement improved agriculture practices and technology to enhance resilience to climate change.
Livestock	
5.1	Develop emissions target for the livestock sector to guide national reporting of GHGs.
5.2	Work on livestock stock genetics improvement.
Waste Management	
6.1	Enhance landfill infrastructure to better sort and process municipal solid waste.
6.2	Focus on Honiara faecal sludge treatment and regulations.
Enabling Institutions	
7.1	Consolidate climate and forest protection policy areas to better achieve emissions reduction goals.
7.2	Develop a program to enable participation in public and private carbon markets, including Article 6 transactions.
7.3	Establish the National Climate Change Trust Fund to consolidate international assistance, financial reporting requirements, and channel investment into needed areas, including R&D.
7.4	Set up institutional arrangements and build capacity to independently measure and report emissions and emissions-related activities.

National Development Strategy (NDS) 2016-2035

The National Development Strategy[14] 2016 to 2035 is focused on improving the social and economic livelihoods of all Solomon Islanders. The NDS 2016-2035 maps out a strategic direction for the future development of Solomon Islands. It presents a visionary strategy for the next twenty years, setting out a long-term vision, mission and objectives that reflect the aspirations of all Solomon Islanders. The overall vision and long-term objective of the NDS is to achieve an improvement in the social and economic livelihoods of all Solomon Islanders. Of the NDS have 5 objectives and one of the objectives is "Resilient and environmentally sustainable development with effective disaster risk management, response and recovery". One of the mid-term strategy and priorities for the implementation of NDS for achieving the longer term NDS objectives includes "Expand and upgrade weather resilient infrastructure and utilities focused on access to productive resources and markets and to essential services".

It has a Medium-Term Strategy #10: improve disaster and climate risk management including prevention, risk reduction, preparedness, response and recovery as well as adaptation as part of resilient development.

And Medium-Term Strategy #11: Manage the environment in a sustainable way and contribute to climate change mitigation.

The key climate change mitigation actions, targets and measures included under the NDS are:

- Increase the supply and coverage of electricity in rural areas using renewable energy resources, focusing on hydro-power in larger islands and solar power on water short atolls and outer islands whilst evaluating other renewable resources and adopting both appropriate technologies and institutional arrangements including community management, Private Power Provider (PPP) and Independent Power Provider (IPP).
- Ensure reliable and affordable power supply in all urban centres by promoting use of renewable energy, opening the market to IPPs, appropriate pre-paid tariff structures and ensuring SIEA has sound technical and managerial expertise for efficient and effective SOE.
- The proportion of homes with no electricity supply is targeted to be reduced from 50% in 2010 to less than 20% by 2035.
- The proportion of homes using solar power energy is targeted to increase from 15%-50% by 2035.
- Improve and maintain utilities notably water and sanitation services.
- Develop renewable energy resources including Tina River and Fiu River hydropower schemes.

[14] https://solomonislands-data.sprep.org/system/files/National%20Development%20Strategy.pdf

- Reduce energy costs by promoting energy conservation and efficiency, in the context of the introduction of product standards for appliances including appliance labelling, energy efficiency ratings and promotion of energy efficient technology and ensure minimal negative environmental impacts of energy production, distribution and consumption on the environment.

National Climate Change Policy 2023-2032

The National Climate Change Policy (NCCP) (2023- 2032) with the vision for a resilient, safe and low carbon emitting Solomon Islands, is intended to guide anticipatory and response measures to deal with the impacts of climate change and to capitalize on opportunities to strengthen low emission resilient development pathways. The opportunity to achieve the above will be taken through adaptation, addressing loss and damage, and mitigation measures. Most of the Governments policy objectives from the first NCCP (2012-2017) have not been implemented. However, many of these objectives still remain pertinent today and form part of this National Climate Change Policy outcomes, directives and strategies such as aims to enhance the country's adaptive capacity while pursuing a path of low-carbon development (NCCP, 2023).

In recognizing the need to enhance adaptive capacity while pursuing a low carbon development pathway, the National Climate Change Policy provides a national strategic framework for the country to address the challenges and benefit from the opportunities that climate change brings. The policy seeks to find a balance between socio-economic development and sustainable utilization of natural resources as a climate change adaptation and mitigation measure.

National Energy Policy 2014

The 2014 SINEP is intended to guide energy sector planning over the next ten years (2014–2024) and is expected to contribute to the achievement of Solomon Islands' national vision: 'A united and vibrant Solomon Islands' and the vision of the energy sector of unlocking the development potential of Solomon Islands' economic base through a dynamic and effective energy sector. The policy is also intended to guide the development over the next five years of energy sub-sector strategies and investment plans.

This policy has divided Solomon Islands energy sector into six sub-sectors (thematic areas). These include:

- planning, coordination, leadership and partnership,
- electric power (urban),
- electric power (rural),
- renewable energy,
- petroleum and alternative liquid and gaseous fuels; and
- energy efficiency and conservation.

Each sub-sector is supported by a policy outcome, policy statement, policy details and key priorities.

National Forest Policy 2020

The vision of the National Forest Policy is: "Forests resources and ecosystems are sustainably and responsibly managed for the benefit and resilience of all Solomon Islanders." This policy is guided by ten principles, which sets the framework for the policy's strategies, goals and objectives, as well as given direction for its implementation. An important guiding principle is to shift from unsustainable logging to sustainable forest management, thereby reversing the depletion of forest resources.

The key strategic areas of this policy are Forest Conservation. Forest Management, Economy and Markets, Community Governance, Monitoring and Low Enforcement and Transparency Strategy. Hence, this policy broadly recognizes the multiple uses and benefits that the forestry sector provides to Solomon Islands as country and society, its people and the resource owners through its many economic, social and ecological benefits. Each strategy provides a set of goals, objectives and expected results and outputs; all for which will contribute towards reaching the desired vision for the Solomon Islands Forests.

The Goal 8: Forest Plantations of the policy sets out the following objectives:

I. Encourage the development of industrial and small-scale forest plantations (e.g. community/church woodlots and family plantations).
II. Promote market access for forest plantation products from community woodlots,
III. Promote landowners/resources owners' capacity and skills for the establishment of forest plantations, silvicultural practices and forest management.

The Government of the Solomon Islands has taken measures to integrated climate change into multiple national-level policies, strategies, and plans and into the planning of several sectors. The updated NDC is aligned with primary policies, strategies, and plans of the following categories: Multi-Sector National Strategy and Planning, Renewable Energy, Land Transport, Forestry, and Waste.

Solomon Islands National Energy Policy 2019

The draft Solomon Islands National Energy Policy (SINEP) presents the priorities of the Government and the strategic directions for key initiatives in the energy sector over the next 10 years to enable sustainable economic development in the country. This SINEP is an improvement to the 2007 and 2014 SINEP and is closely linked to the National Development Strategy (NDS) of Solomon Islands 2016 – 2035 and its vision of "Improving the Social and Economic Livelihoods of all Solomon Islanders". The policy is also intended to guide the development over the next five years of energy sub-sector strategies and investment plans. The vision and mission of the policy is "Unlocking the development potential of Solomon Islands' economic base through a dynamic and effective energy sector" and "Provide the base for appropriate coordination, planning, promotion, development and management, and efficient use of energy resources" respectively.

The policy outcomes are as follows:

- Development of Energy Legislations.
- Increase access to electricity in urban households to 80% by 2025.
- Increase access to electricity in rural households to 40% by 2035.
- Increase access of safe, affordable and reliable petroleum fuels to outer islands and remote rural locations.
- Increase the use of renewable energy sources for power generation in urban and rural areas to 50% by 2035.
- Increase the development and penetration of gaseous fuels and alternative liquid fuels from indigenous raw materials.
- Improve energy efficiency and conservation in all sectors by 10% by 2035.

Renewable Energy Roadmap (2021)

Solomon Islands Renewable Energy Roadmap report was formulated by the Ministry in partnership with Solomon Power with support by the Japan International Cooperation Agency (JICA). The objective is to develop a roadmap for 100% renewable energy generation for the Honiara grid to 100% by 2030 and increase energy access for Honiara to 100% 2050.

The following table provides a comprehensive overview of the mitigation actions that have been implemented, are currently ongoing, or are planned for implementation under the Solomon Islands NDC:

Table 4: List of mitigation actions: implemented, ongoing or planned under the Solomon Islands NDC

SN	Title	Objective	Key Sector	Key Sub-sector	Start Date	Implementing entity or entities	Other Agency	Location	Status	GHG Emission Reductions Expected (tCO_2 eq) (Annually)
1	Solar Hybrid Systems (Conversion Projects) 2020- Munda, Tulagi, Kirakira, Malu'u, Lata)	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Western , Central, Makira, Malaita, Temotu	In progress	1460

2	Solar-Diesel Hybrid Systems 2020-2021-Hauhui, Sasamunga, Namugha, Vonunu, Selwyn College, Wairokai Community High School	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Malaita, Choiseul, Makira, Western, Guadalcanal, Malaita	In progress	1006.72
3	Solar-Diesel Hybrid Systems 2021-2022-Visale, Tingoa, Bina, Baolo, Dalo	Mitigation	Energy Generation	Renewable Energy	2021	MECDM	MMERE	Guadalcanal, Renbel, Malaita, Isabel, Malaita	In progress	872.35
4	Ranadi Office Rooftop Solar Farm	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	SIEA office, Ranadi	In progress	160.6
5	Henderson Fighter 1 Extension Solar	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Henderson Airport	In progress	1460
6	Tanagai Solar Farm	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Tanagai	In progress	730
7	Tina River Hydropower Project (15 MW)	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Central Guadalcanal	In progress	49500
8	Current Hydro-Power Stations-Malita	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	1. Malu'u 2. Masupa 3. Manawai 4. Rae'ao 5. Nariao	1. To be repaired 2. To be repaired 3. Operational 4. Operational 5. Operational	113.15

9	Current Hydro-Power Stations-Western	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	1. Vavanga 2. Bulelewata 3. Palagati	1. Implemented (Operational) 2. Implemented (Operational) 3. In progress	82.49
10	Current Hydro-Power Stations-Guadalcanal	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Fox Bay	In progress	36.5
11	Current Hydro-Power Stations-Makira	Mitigation	Energy Generation	Renewable Energy	2020	MECDM	MMERE	Naharahau	In progress	36.5
12	Luembalele River Hydropower (190 kW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE	Temotu Province	Feasibility	1065.22
13	Huro River Hydropower (120 kW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE	Makira Province	Feasibility	672.77
14	Mase River Hydropower (1.75 MW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE	Western Province	Feasibility	9811.2
15	Sorave River Hydropower (200 kW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Prefeasibility	1121.28
16	Rori River Hydropower (300 kW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Feasibility	1681.92
17	Vila River Hydropower (1.21 MW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Prefeasibility	6783.74
18	Kakabona Solar PV (1 MW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Feasibility	1401.6
19	OFF-GRID SOLAR – DIESEL HYBRID SYSTEMS-10 Boarding Schools	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Prefeasibility	1160.8

20	OFF-GRID SOLAR – DIESEL HYBRID SYSTEMS-Whole Country	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Feasibility 2035	0.1
21	OFF-GRID SOLAR – DIESEL HYBRID SYSTEMS-Solomon Water seven pump stations (6 Honiara based and 1 Auki based stations)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Feasibility	325.91
22	Savo Geothermal Project (20–40 MW)	Mitigation	Energy Generation	Renewable Energy		MECDM	MMERE		Preliminary Assessment	224256

Nationally Determined Contribution (NDC) Investment Plan (Draft)

This draft Nationally Determined Contribution (NDC) Investment Plan, including pipeline of opportunities, has the overall goal to enhance the Government of the Solomon Islands ability to implement mitigation and adaptation opportunities within renewable energy, land transport, forestry and waste sectors.

The Nationally Determined Contribution (NDC) Investment Plan has five key objectives:

Objective 1: To provide stakeholders, including potential financial partners, with a general description of the status of the sectors. This includes basic information on the sector's current development, market structures, existing planning, and actions, along with a list of the key stakeholders operating within the sectors.

Objective 2: To identify the key constraints to low-carbon and adaptation development in the sectors and opportunities to strengthen the enabling environment.

Objective 3: To briefly describe the pipeline of mitigation and adaptation opportunities that will contribute to current and future NDC targets and investment needs.

Objective 4: To present the overall needs for financial products and instruments that can support financing in the sectors and identify potential partners for financial cooperation and a pathway to implement new financing in the sector.

Objective 5: To help enhance the next Nationally Determined Contribution of the Solomon Islands, which is expected to be prepared in 2025.

It is noted that the mitigation and adaptation opportunities defined in this NDC Investment Plan are aligned with the country's vision and long-term policies such as the Solomon Islands Long-Term Low Emissions Development Strategy and National Development Strategy 2016-2035, but only the renewable energy opportunities fall within the boundary of the NDC 2.0 issued in 2021.

This NDC Investment Plan identifies 14 mitigation and adaptation opportunities in terms of potential planning for implementation and financing. These mitigation and adaptation opportunities consist of five opportunities in renewable energy, four in land transport, three in forestry, and two in waste & manure management.

These opportunities, their investment needs and mitigation potential are shown in the table below.

Table 5: List of mitigation and adaptation opportunities with their investment needs and mitigation potential

Mitigation & Adaptation Opportunities	Annual Mitigation in 2030 (kt CO_2/yr)	Annual Mitigation in 2035 (kt CO_2/yr)
R1 - Fiu River Hydro Power Station	0	8.1
R2 - Komarindi River Hydro Power Station	0	31.4
R3 - Mase River Hydro Power Station	0	17.5
R4 - Solar Mini-Grids for Public Schools and Institutions	1.3	1.3
R5 - Solar Micro-Grids for Tourism Sites	2.1	2.1
Totals for Renewable Energy	3.4	60.5
T1 - Age Limits for Vehicles	6.7	12.2
T2 - Resilient Roads Improvement Programme	0	0
T3 - E-mobility for buses in the Honiara area	1.7	5
T4 - Local alternative/Biofuel for ICE vehicles	0.1	0.1
Totals for Land Transport	8.5	17.3
F1 - Promotion of Community Forestry for Livelihoods	60	67.5
F2 - Eco-system Based Restoration of Degraded Forest Land Area	18	52.5
F3 - Increasing the Growth of Mangrove Forests	43.2	80
Totals for Forestry	121.2	200
W1 - Waste Management in Lata and Buala Areas	0.2	0.5
W2 - Biogas Production in Rural Communities and Farms	2.1	2.4
Primary Totals	135.4	280.6

Summary of greenhouse gas emissions and removals

Solomon Islands GHG emissions for 2022 (excluding removals) totaled 576.83 kt CO_2 eq. A breakdown of the total GHG emissions by IPCC sectors and GHG type in kt CO_2 eq can be found in the table below with a detailed report of each sector found in Chapter 2.

Table 6: Summary of GHG emissions and removals

Emissions Sector	2022 emissions (kt CO_2 eq)	1994 emissions (kt CO_2 eq)	% change in 2022 since 1994	2015 emissions (kt CO_2e)	%change in 2022 since NDC Reference period (2010)
1. Energy	323.23	298.77	8.19	309.60	4.41
2. Industrial Processes and Product Use	0.49	NO	100.00	0.37	31.62
3. Agriculture	198.74	NE	198.65	164.58	20.76
4. Land use, land use change and forestry	-31757.76	NE	-13.71	-26350.09	20.52
5. Waste	54.37	NE	100.00	44.85	21.22
Total emissions (excluding removals), kt CO_2 eq	576.83	298.77	93.07	519.02	11.14
Total emissions (with removals), kt CO_2 eq	-31180.93	298.77	-10536.27	-25831.07	20.71

Projections of greenhouse gas emissions and removals, as applicable

Solomon Islands projected its emissions under a 'Business-as-usual (BAU) or Without-measures (WOM)', 'With Existing Measures (WEM)' and 'With Additional Measures (WAM)' scenarios for 2030, 2035 and 2050. The emissions scenarios are based on historical emissions, with projections for the periods 2010-2030, 2035 and 2050 made using Excel based statistical model using the applicable guidance for estimating projected GHG emissions. The three scenarios presented and the projected GHG emissions under them are discussed here below:

- BAU scenario or WOM: Assessment based on what might happen if Solomon Islands takes (or has taken) no action (WOM).
- NDC scenario or WEM: Assessment based on what might be achieved with the actions that Solomon Islands is committed to take under the existing NDC (WEM or, sometimes, known as WM).
- LEDS Scenario or WAM: Assessment based on the impacts of implementing the additional actions identified in the Low Emissions Development Strategy (LEDS), representing the low emissions development pathway (WAM) for the Solomon Islands.

These three scenarios have been assessed using the same set of historical data and the projections. The projected estimates thus reflect the impacts of relevant actions on GHG emissions.

Total GHG Emissions (excluding removals)

BAU Scenario or WOM: Under the "Without Measures" (WOM) scenario—representing a business-as-usual trajectory– Solomon Islands' greenhouse gas (GHG) emissions are projected to reach 698.21 kt CO_2 eq by 2030, 745.85 kt CO_2 eq by 2035, and 892.07 kt CO_2 eq by 2050.

NDC Scenario or WEM: In contrast, the "With Existing Measures" (WEM) scenario– aligned with the Solomon Islands' Nationally Determined Contribution (NDC)– projects emissions of 631.34 kt CO_2 eq by 2030, representing a 9.58% reduction compared to the WOM scenario. Emissions are further projected to be 673.43 kt CO_2 eq by 2035 (9.71% reduction) and 800.08 kt CO_2 eq by 2050 (10.31% reduction), relative to the WOM scenario.

LEDS Scenario or WAM: The "With Additional Measures" (WAM) scenario anticipates emissions of 619.44 kt CO_2 eq by 2030, reflecting a 11.28% reduction from the WOM scenario. By 2035, emissions are projected at 647.76 kt CO_2 eq (13.15% reduction), and by 2050, at 535.06 kt CO_2 eq, corresponding to a 40.02% reduction compared to the WOM scenario.

Figure 1: Solomon Islands Projected Total GHG Emissions Reduction Scenarios (excluding removal)

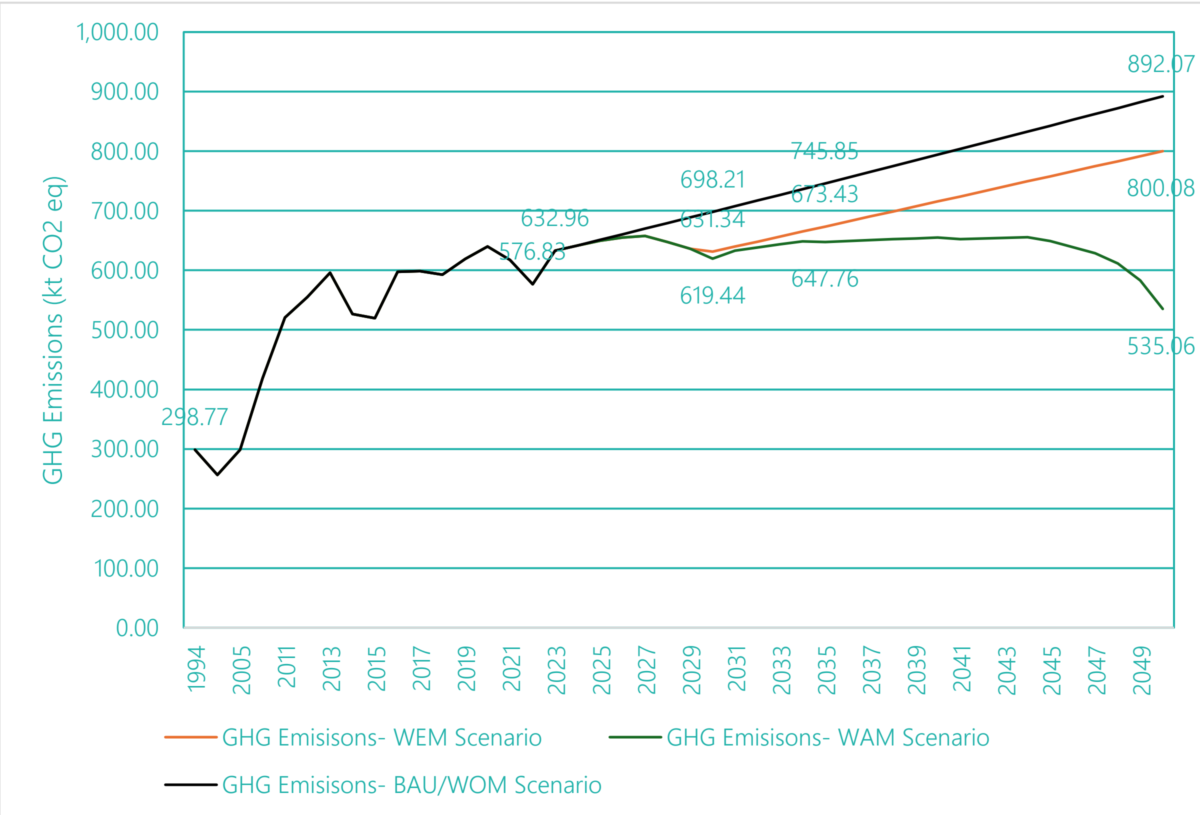


Table 6: Projected Total GHG Emissions and Percentage change in Emissions (kt CO_2 eq)

Scenario	2030 (kt CO2 eq)	% Change (vs WOM) in 2030	2035 (kt CO_2 eq)	% Change (vs WOM) in 2035	2050 (kt CO_2 eq)	% Change (vs WOM) in 2050
BAU (WOM)	698.21	-	745.85	-	892.07	-
NDC (WEM)	631.34	-9.58%	673.43	-9.71%	800.08	-10.31%
WAM	619.44	-11.28%	647.76	-13.15%	535.06	-40.02%

Net GHG Emissions

BAU scenario or WOM: Under the "Without Measures" (WOM) scenario, net emissions are projected to be -26,973.17 kt CO_2 eq in 2030, -27,641.20 kt CO_2 eq by 2035, and -27,232.59 kt CO_2 eq by 2050. These negative values indicate that carbon removals exceed emissions in these years.

NDC scenario or WEM: Under the "With Existing Measures" (WEM) scenario, net emissions are projected to be -27,040.03 kt CO_2 eq in 2030. This represents a 0.25% increase in net removals compared to the WOM scenario. By 2035, net emissions are projected to be -27,713.62 kt CO_2 eq, a 0.26% increase in net removals. By 2050, net emissions are projected to be -27,324.57 kt CO_2 eq, a 0.34% increase in net removals.

LEDS Scenario or WAM: Under the "With Additional Measures" (WAM) scenario, net emissions are projected to be -27,051.93 kt CO_2 eq in 2030, a 0.29% increase in net removals compared to the WOM scenario. By 2035, net emissions are projected to be -29,158.65 kt CO_2 eq a 5.49% increase in net removals. By 2050, net emissions are projected to be -45,089.59 kt CO_2 eq, a 65.57% increase in net removals.

Figure 2: Solomon Islands Projected Net GHG Emissions Reduction Scenarios

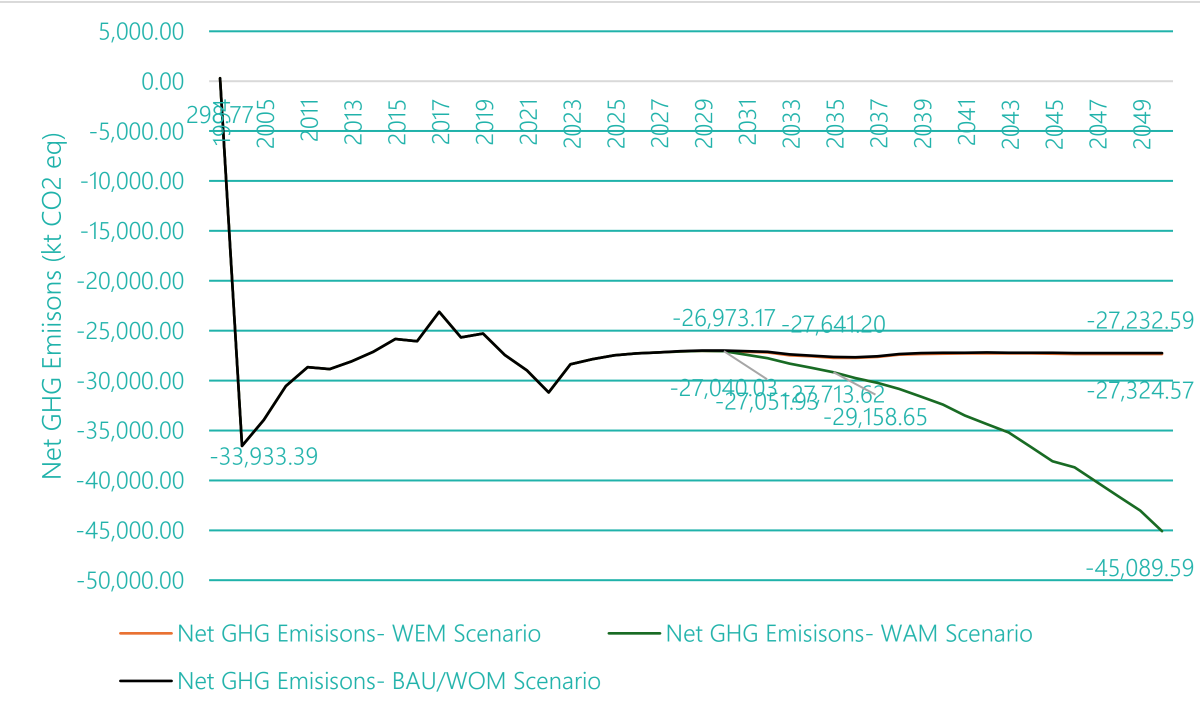


Table 7: Projected Net GHG Emissions and Increase in Net Removals (kt CO_2 eq)

Scenario	2030 (kt CO_2 eq)	% Incr. Net Removals (vs WOM) in 2030	2035 (kt CO_2 eq)	% Incr. Net Removals (vs WOM) in 2035	2050 (kt CO_2 eq)	% Incr. Net Removals (vs WOM) in 2050
BAU (WOM)	-26,973.17	-	-27,641.20	-	-27,232.59	-
NDC (WEM)	-27,040.03	0.25%	-27,713.62	0.26%	-27,324.57	0.34%
WAM	-27,051.93	0.29%	-29,158.65	5.49%	-45,089.59	65.57%

Flexibility provisions used in NDC tracking

Due to current limitations in robust data, financial resources, and technical capacity, the Solomon Islands has exercised its right to flexibility as a Small Island Developing State (SIDS) in reporting detailed procedures, sensitivity analyses for projections and assumptions, and key indicators. As data collection methods improve and national capacities are strengthened over time, the Solomon Islands is committed to progressively incorporating all components outlined in paragraphs 93–101 of the MPGs.

Solomon Islands currently does not have an adequate assessment of mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans consistent with Article 4, paragraph 7, hence is unable to quantify the expected and achieved GHG emission reductions for its adaptation actions. Given this limitation, Solomon Island is using the flexibility provisions in reporting requirements under Para 85 of the MPGs.

V. Information related to climate change impacts and adaptation under Article 7 of the Paris Agreement

National Circumstances, Institutional Arrangements & Legal Framework

National Circumstances

National Circumstances for Solomon Islands have been discussed in detail in Chapter1 of the BTR. The Solomon Islands is an archipelago located in the located in the Melanesian region in the South Pacific. It is comprised of 994 islands with a total land area of less than 30,000 km^2 and a population of around 754,104 people (NSO, 2023). The country has a tropical climate, though temperatures are rarely extreme due to cooling winds blowing off surrounding winds. The location of Solomon Islands is on the path of cyclones, which pose a serious threat to the people, economy, and environment and result in flooding and wind damages. Additionally, climate change impacts such as Seal level Rise, increase temperature, ocean acidification, storm surges, erosion and other coastal hazards, increased intensity of extreme events have been identified for the Solomon Islands affecting many key sectors such as, agriculture, food, water human health and infrastructure.

The unstable economy, coupled with a relatively high population growth rate, fragile ecosystems, unsustainable extractive practices especially in the forestry and mining sectors and the lack of or limited legislative and policy guidance limits the adaptive capacity of most Solomon Islanders and increases the vulnerability of Solomon Islands to climate change.

However, The Solomon Islands Government has recognized the importance of climate change to the country's future. The Government endorsed the Climate Change Policy (2023-2032), which is aligned with the National Development Strategy (2016–2035). Adaptation programmes and activities have also been implemented in accordance with priorities identified in nationally planning documents including the National Adaptation Programme of Action, the National Climate Change Policy and the National Development Strategy.

Institutional and Legal Framework

The Solomon Islands Government (SIG) is committed to integration of climate change considerations into national development priorities and has adopted a holistic inclusive integrated planning approach towards climate change integration. To achieve this the government established a specific ministry to address climate change issues in the country.

Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM): The MECDM is the lead agency responsible for climate change policy formulation, coordination, and implementation in the Solomon Islands. It houses the Climate Change Division (CCD), which plays a central role in:

- Coordinating national adaptation planning and reporting obligations under the UNFCCC.

- Mainstreaming climate resilience into national and sectoral development plans.
- Engaging with international partners and donors for climate adaptation finance and technical support.
- Implementing community-based adaptation projects.

Climate Change Department: The Climate Change Division (CCD), under the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), is the central body responsible for coordinating climate change policy, planning, implementation, and reporting in the Solomon Islands. Its work is critical due to the country's high vulnerability to climate change impacts such as sea-level rise, extreme weather, and shifting rainfall patterns.

Key Roles and Responsibilities:

1. Policy Coordination & Leadership: CCD leads the development and implementation of adaptation policies aligned with national priorities such as the National Climate Change Policy (2023–2032), National Development Strategy (2016–2035), NAPA, and NDC (2021). It serves as the national UNFCCC focal point on adaptation.

2. Mainstreaming Adaptation: It integrates adaptation into national and sectoral plans by supporting ministries (e.g., agriculture, health) and coordinating with provincial governments and communities.

3. Climate Finance Mobilization: CCD develops proposals for funding from sources like the GCF, Adaptation Fund, and GEF, and coordinates with the Ministry of Finance on readiness activities and budgeting for adaptation investments.

4. Technical Support & Capacity Building: It conducts vulnerability assessments, offers technical assistance and training, and supports pilot adaptation projects across sectors and communities.

5. Monitoring & Reporting: CCD develops adaptation indicators, tracks progress, and prepares reports (e.g., National Communication, BUR, BTR). It also supports the NAP process under the Paris Agreement's Enhanced Transparency Framework.

6. Stakeholder Engagement & Awareness: CCD facilitates inclusive consultations with traditional leaders, civil society, and the private sector, while leading awareness campaigns and promoting community-based adaptation.

7. Regional & International Coordination: As UNFCCC focal point, CCD represents Solomon Islands in regional forums such as the Secretariat of the Pacific Regional Environment Programme (SPREP), and the Pacific Community (SPC).

National Disaster Management Office (NDMO): The governance framework for disaster management is established under the National Disaster Council (NDC) Act 1989 and National Disaster Management Plan (NDMP) 2018. The NDC advises the government on issues related to DRR, disaster management, preparedness, and response. The National Disaster Management

Office (NDMO) is the Secretariat of the NDC. The NDC is chaired by the Permanent Secretary for MECDM.

There are three committees under the National Disaster Council (NDC):

- National Disaster Operations Committee (N-DOC): Responsibilities include public awareness and training, early warning arrangements, and assessment and response structures for managing disaster events and coordinating available resources to support affected communities.
- Recovery Coordination Committee (RCC): The RCC is chaired by the Permanent Secretary or Under Secretary of the Ministry of National Planning and Development Coordination (MNPDC). This committee supports the MNPDC's coordination of post-disaster recovery and rehabilitation
- Climate and Risk Resilience (CRR) Committee: The CRR Committee is responsible for addressing hazards and the reduction of disaster and climate risk within social and development planning processes and practices. working relationship with the Committees of the NDC and at the provincial level.

In response to the NDS, government sectors have also begun to integrate some aspects of climate change considerations into their sector policies and programs. The situational analysis conducted by the Risk Resilient Development Committee in 2014 and 2016 found the following sectors had commenced integration work at different levels in alignment with the NDS and the Climate Change Policy.

Table 1: Government Ministries and Climate Change Adaptation focus:

Ministry /Committee	Climate change Adaptation (initiative/plan/action)
Ministry of Forestry and Research (MoFR)	Readiness Roadmap 2014 – 2020 considered the management of forest integrating the need for social safeguard and potential risk. Solomon Islands National Forest Policy 2018.
Ministry of Health and Medical Services (MHMS)	Manages and delivers through the RWASH Programme through the Environmental Health Division. The goal of the RWASH Program is to improve the health and wellbeing of rural communities through improved and appropriate WASH facilities and hygiene practices. Development of National Climate Change and Health Adaptation Plan. MHMS commenced its integration work through establishment of the Health Emergency Response Unit focusing more on disaster risk management.
Ministry of National Planning & Development Cooperation (MNPC).	Disaster risk reduction and post-disaster recovery and rehabilitation with the RCC.

	National Development Strategy (NDS) 2016-2035 NDS Objective Four: Resilient and environmentally sustainable development with effective disaster risk management, response and recovery.

Guiding Legislation

The four divisions under the MECDM are associated with five legislated mandates.

The Environment & Conservation Division is responsible for three acts, namely:

- Environment Act 1998;
- Wildlife Protection and Management Act 1998;
- Protected Areas Act 2010

The Meteorological Services Division:

- Meteorology Act 1985

The National Disaster Management Office:

- National Disaster Council Act 1989.

Laws that govern all divisions of the MECDM are:

- The Essential Services Act and;
- Civil Aviation Act 2008
- Part 174 Civil Aviation Rules – Aviation Meteorological Service Organization Certification Act.

Impacts, risks and vulnerabilities

Climate Trends

Current observed climate trends

Solomon Islands has a tropical monsoon climate with temperatures throughout the year not exceeding 32°C. However, there is considerable year on year temperature variation due to the El Niño-Southern Oscillation (ENSO) and the influence of other climate drivers such as the western monsoon, South Pacific Convergent Zone (SPCZ) and the Inter Tropical Convergence Zone (ITCZ). As it is located in the tropical belt the islands receive abundant rainfall, averaging between 3,000–3,500 mm (120–140 inches) a year. Precipitation occurs throughout the year. The graphs in Figure 1 show the monthly mean temperatures and precipitation amounts for the country for the period 1991-2022. As observed in the graph, precipitation is highest from January to March and decreases slightly from May to November, still within the range of 200-250 mm (8- 10 inches) per month. While the temperatures remain warm and relatively stable throughout the year, with only slight variations in maximum, mean, and minimum temperatures. This indicates a wet season at the beginning of the year and a drier period from mid-year.

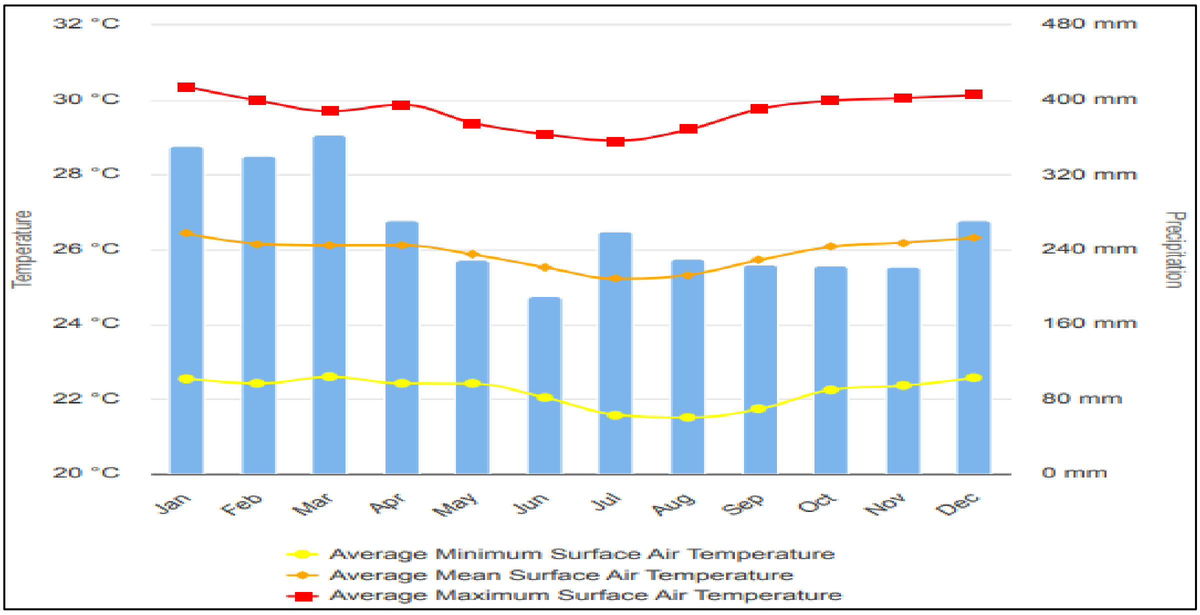


Figure1: Average Monthly Temperature and Precipitation, Solomon Islands (1992 -2022)[15]

Observed temperature data by the Solomon Islands Meteorological Services show that annual surface temperature for the western, central and eastern regions of Solomon Islands have increased during the last 30 to 50 years. The range of increase in mean air temperature for most provinces is between 0.14 ℃ and 0.17℃/decade. Records for Honiara and Munda regions indicate annual surface temperatures from 1952 and 1963 respectively. The country's sea level data indicates that it is rising at 8mm/annum which is nearly 2-3 times higher than the global average (Australian Bureau of Meteorology and CSIRO, 2014). The Solomon Islands, although a small archipelago of islands faces significant impact of climate change. To make matters worse, the country with limited land and monetary resources is battling both extreme weather events as well as slow onset events caused due to climate change.

Projected future Climate trends

The initial climate change projections for the Pacific Island countries were developed by the Pacific Climate Change Science Programme (PCCSP), Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation (CSIRO) 2011. However, there are more recent studies such as the Pacific-Australia Climate Change Science and Adaptation Planning Program (PACCSAP) publication 2014, climate change projections done by the United Kingdom Meteorological Office in 2021 and the World Bank Climate Risk Country Profile of Solomon Islands 2021 which provide a credible snapshot of what the future. These recent studies were used to inform and prioritize climate actions in Government plans and policies.

[15] https://climateknowledgeportal.worldbank.org/country/solomon-islands

Projections for future climate in the Solomon Islands are based on various global climate models (GCMs) under different greenhouse gas concentration pathways. These pathways, known as Representative Concentration Pathways (RCPs), outline different emissions scenarios, with RCP2.6 representing low emissions and RCP8.5 representing high emissions. Using these scenarios, climate models downscaled for the region, project significant changes in temperature, precipitation, and sea-level rise for the Solomon Islands throughout the 21st century. Figure 4 gives a snapshot of climate projection under RCP 8.5 for Solomon Islands for the year 2030 and 2055, developed by Pacific Climate Change Science Programme from Australia's Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation (CSIRO). These climate change projections were corroborated by climate change projections done by the United Kingdom Meteorological Office in 2021 as part of the International Partnership Programme Commencing Project (NCCP, 2023).

Variable	Expected Change	Projected 2030	Projected 2055
Annual surface temperature	Average air temperature will increase	+0.4–1.0°C (0.72-1.8°F)	+1.0-+1.8°C (1.8-3.24°F)
Maximum temperature (1-in-20-year event)	More very hot days	n/a	+1.0-1.5°C (1.8-2.7°F)
Minimum temperature (1-in-20-year event)	Temperatures will continue to increase	n/a	+1.2-1.7°C (2.16-3.06°F)
Annual total rainfall	Annual rainfall will increase	+1.0-2.0%	+4.0-13%
Wet season rainfall	Wet season will increase	+2.0-2.7%	+5.0-11%
Dry season rainfall	Dry season will increase	+2.0-9.0%	+3.0-5.0%
Sea surface temperature	Sea surface temperature will increase	+0.6-1.1°C (1.08-1.98°F)	+0.9-1.3°C (1.62-2-34°F)
Annual maximum acidification (aragonite saturation)	Ocean acidification will continue to increase	+3.6	+3.1-3.5
Mean sea level	Sea level will increase	+9.0-12 cm (3.5-4.72 inches)	+18.0-21.0 cm (7.1-8.26 inches)

Figure 3: Climate Change Projections for Solomon Islands for 2030 and 2055 under High Emissions[16]

Temperature Projections

Temperature increases are one of the most consistent projections across all climate models. Under both RCP2.6 and RCP8.5, the Solomon Islands will experience warming, though the extent will vary depending on global mitigation efforts. In the RCP2.6 low emission scenario average temperature increase in the Solomon Islands is projected to range between 1.0°C to 1.5°C by the end of the century (2081–2100), compared to the pre-industrial baseline. In the high emissions scenario RCP8.5, where emissions continue to rise unchecked, the Solomon Islands could see average temperature increases between 2.5°C to 4.0°C by the late 21st century (WHO, 2020).

[16] Solomon Islands Disaster Management Reference Handbook October 2023

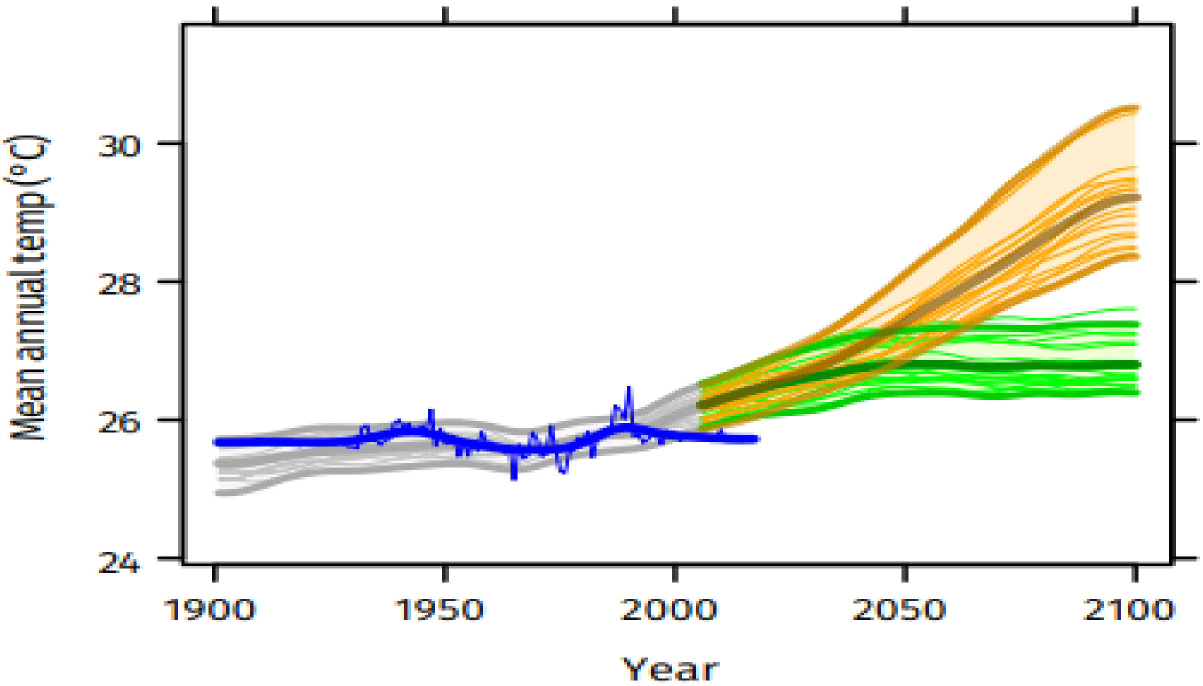


Figure 4 1: Mean annual temperature, 1900–2100[17]

Precipitation Projections

Precipitation patterns are expected to become more variable, with models projecting changes in both seasonal and annual rainfall patterns. Under the RCP2.6 rainfall projections are less dramatic, though slight increases in wet season precipitation (November to April) are expected. On average, models suggest a 2% to 5% increase in annual rainfall by the end of the century. However, there will still be significant year-to-year variability, influenced by broader climatic phenomena such as the El Niño-Southern Oscillation (ENSO). RCP8.5 high emissions scenario, rainfall patterns are projected to change more dramatically. The Solomon Islands could experience a 5% to 10% increase in annual precipitation by 2100. This increase is mainly due to more intense rainfall events during the wet season. However, some models predict longer dry spells between heavy rain events, increasing the risk of both droughts and floods. This combination of heavy rainfall and prolonged dry periods could disrupt agriculture, reduce water quality, and increase the incidence of landslides and floods. (WBG, 2021)

[17] The climate model projections below present climate hazards under a high emissions scenario, RCP 8.5 high emissions scenario (orange) and a low emissions scenario (green). Projected changes averaged across about 20 global climate models (thick line). The figure also shows each model individually as well as the 90% model range (shaded) as a measure of uncertainty and the annual and smoothed observed record (in blue). In the following text the present-day baseline refers to the 30-year average for 1981–2010 and the end-of-century refers to the 30-year average for 2071–2100 (WHO, 2020).

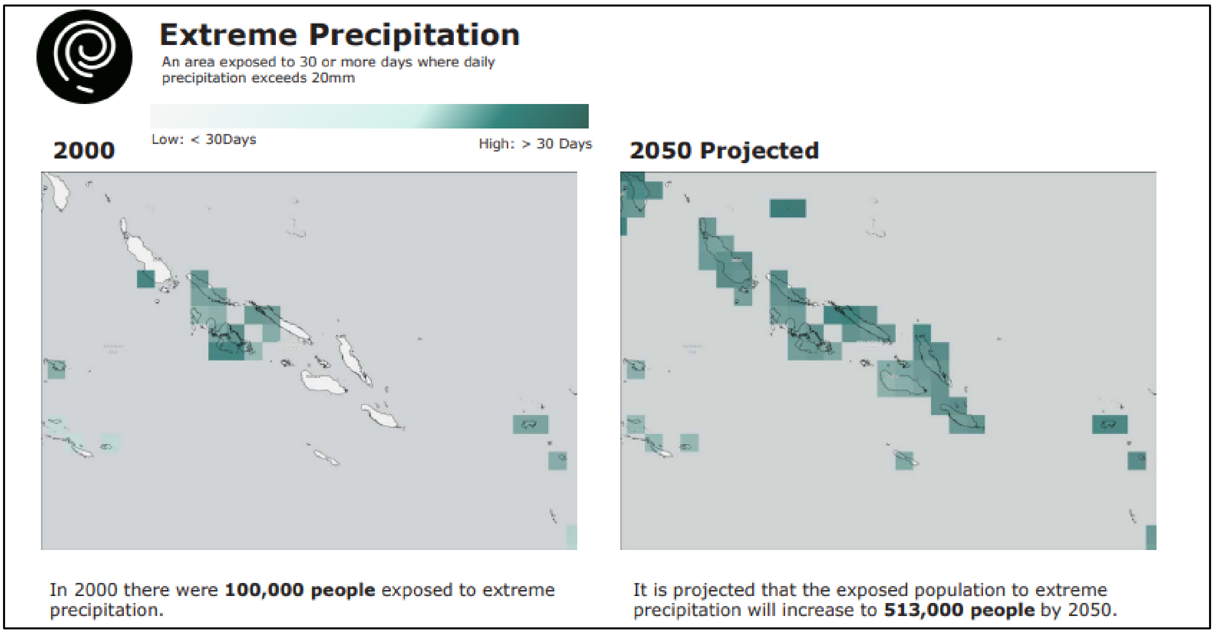


Figure 5: Projected Population Exposed to Extreme Precipitation (2000 and 2050)[18]

The increased intensity of rainfall during tropical storms, combined with more prolonged dry periods, poses significant challenges for the Solomon Islands' water management and agricultural sectors, which are heavily dependent on predictable rainfall patterns.

Sea-level Rise

Sea-level rise is one of the most pressing concerns for low-lying island nations like the Solomon Islands. Under RCP2.6 Low Emissions Scenario, global sea-level rise is projected to be limited to 0.4 to 0.6 meters by 2100, compared to pre-industrial levels. For the Solomon Islands, this would still represent a significant threat, as even modest rises in sea levels can lead to increased coastal erosion, saltwater intrusion, and flooding of low-lying areas. The High Emissions Scenario RCP8.5 shows sea levels are projected to rise by as much as 0.8 to 1.1 meters by 2100, with some models suggesting an even higher range depending on the rate of ice sheet melting in Greenland and Antarctica. This scenario represents an existential threat to many islands in the Solomon Islands, particularly those atolls that are only a few meters above sea level. Entire communities could be displaced, and critical infrastructure such as roads, schools, and hospitals may be inundated.

While climate models project a general warming and intensification of the hydrological cycle under both RCP scenarios, the interaction between long-term climate change and ENSO variability adds uncertainty to regional projections. For example, the intensity and frequency of both El Niño and La Niña events could change in the future, potentially amplifying the impacts of climate change.

[18] Solomon Islands Disaster Management Reference Handbook October 2023

To summarize:

The climate projections for the Solomon Islands suggest a future of significant challenges under both low and high emissions scenarios. Under RCP2.6, while the impacts of climate change may be less severe, they will still be profound, with noticeable warming, modest increases in rainfall, and sea-level rise threatening vulnerable coastal areas. Under RCP8.5, however, the Solomon Islands face a future marked by extreme heat, more intense rainfall, and devastating sea-level rise, which could make large parts of the country uninhabitable by the end of the century.

Impact on Climate related natural hazards

Solomon Islands faces a range of both hydrometeorological and geophysical hazards. It is closer to the Inter Tropical Convergence Zone, making it prone to tropical cyclones, and is also part of the 'Pacific Ring of Fire' or 'Volcanic Belt'. This existing natural disaster risk is already being exacerbated by the impacts of climate change. The Figure 6 indicates about 80% of major disasters between 1940-2020 are climate-related hazards in the Solomon Islands these includes, Storms, floods, Sea Level Rise and extreme events related to increasing sea surface temperatures (EM-DAT, 2022).

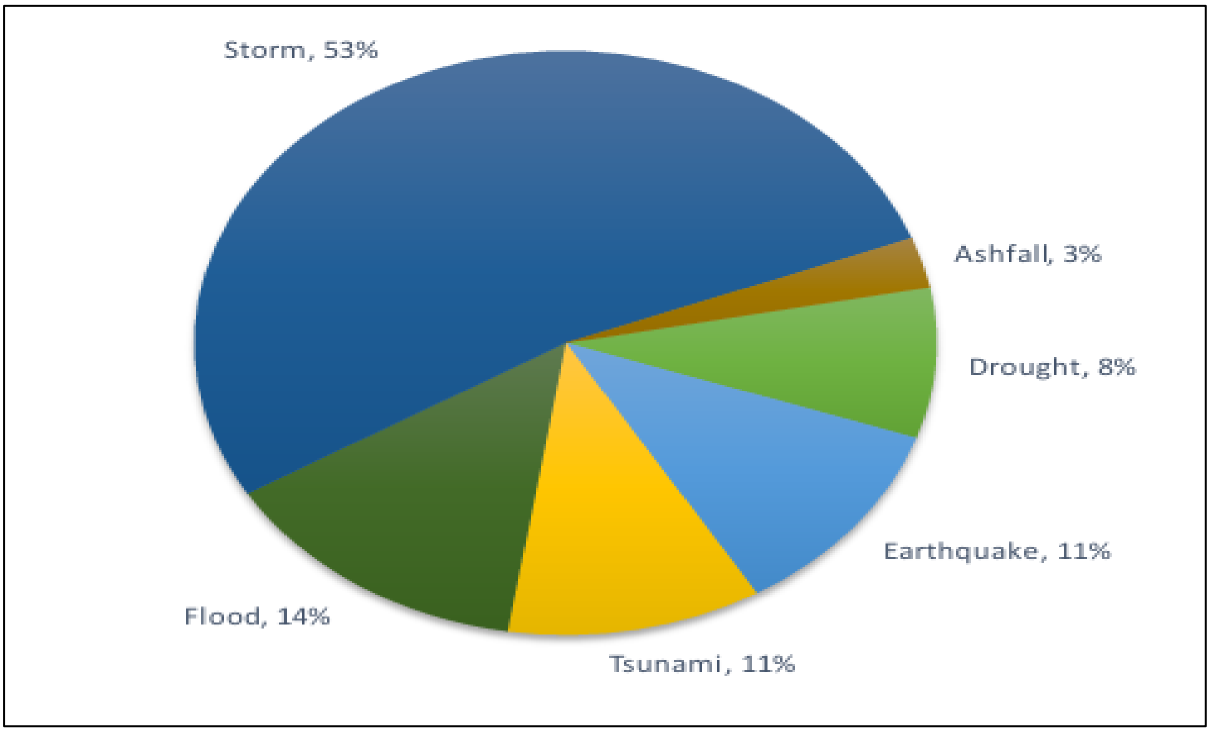


Figure 6: Percentage of types of hazards that cause disasters (1940 -2020)[19]

[19] UNDRR Disaster Risk Reduction in the Solomon Islands Status Report 2023

Tropical Cyclones

Tropical cyclones affect Solomon Islands mainly between November and April. An average of 29 cyclones per decade developed within or crossed the Solomon Islands Exclusive Economic Zone (EEZ) between the 1969/70 and 2010/11 seasons as seen in Figure 8. (WHO, 2019)

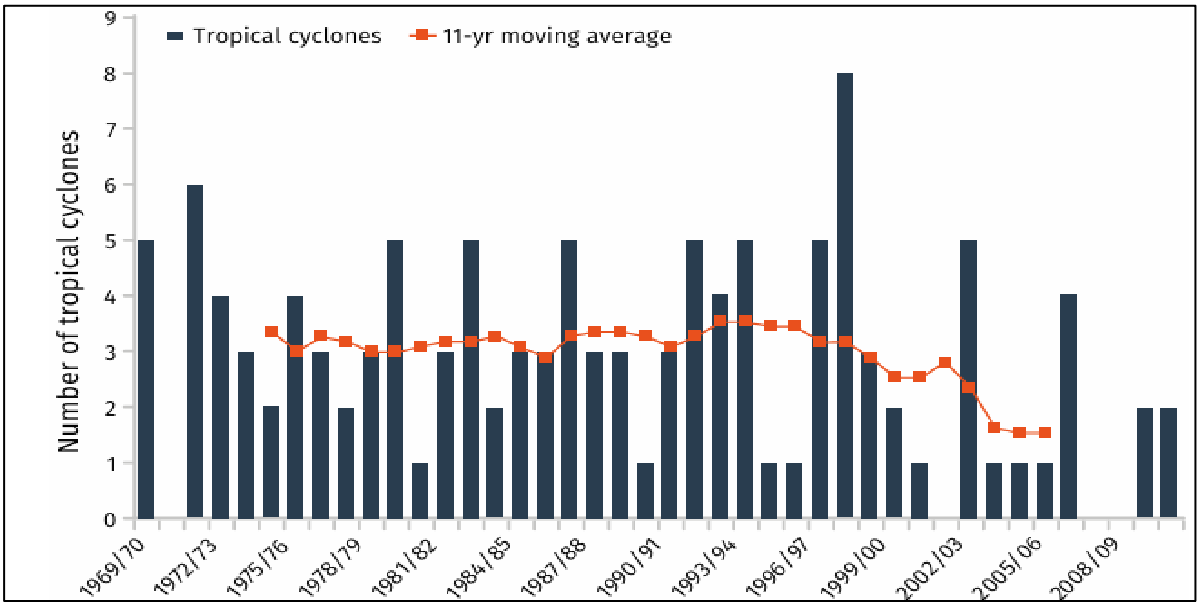


Figure 72: Time series of observed number of tropical cyclones developing within and crossing the Solomon Islands EEZ[20]

In 2020, Tropical Cyclone Harold caused significant destructions to agricultural crops, homes, buildings, and roads across Honiara, Western Province, Guadalcanal, Makire, Rennell and Bellona, and killed 27 people. Many climate models predict a decline in the number of tropical cyclones in the south-west Pacific Ocean.

Sea-level rise also increases the risk of storm surges during tropical cyclones, which are projected to become more intense under both emissions scenarios. The combined effects of rising sea levels and more intense cyclones will exacerbate coastal erosion and flooding, further endangering lives and livelihoods in the Solomon Islands.

Floods

Inland flooding results from heavy and prolonged rainfall that causes the water level in rivers and streams to rise over their banks and inundate the surrounding land. Flash flooding occurs within a few hours of torrential rains with little warning and dissipates rapidly. Coastal flooding occurs when storm surges or waves inundate low-lying coastal areas. Coastal flooding often accompanies tropical cyclones, which bring heavy rains and storm surges. Solomon Islands, due to its climate and topography is prone to all three types of flooding.

[20] (WHO, 2020)

Flash flooding, Heavy rain and strong winds affected Solomon Islands in late December 2018 and early January 2019. The rain caused rivers to burst their banks and sweep through villages on the main islands of Malaita and Guadalcanal. More than 22,000 people saw their homes and crops destroyed by extreme weather. The flash flooding also contaminated drinking water. In March in the same year, heavy rain caused localized flooding across Honiara. Flood waters affected many low-lying areas and significantly disrupted the transport network. The flooding affected 9,000 people, particularly in East Honiara's Panatina ward (CFE-DM, 2023). With the increasing impact of climate change such events have become more frequent and adverse.

Droughts

The increased frequency of heatwaves and warmer days is also expected to be under RCP8.5, which could contribute to higher heat stress for both humans and ecosystems (WBG, 2021). Both low and high emission scenarios show more pronounced warming during the dry season (May to October), which could exacerbate heat-related issues such as water scarcity and agricultural stress. Solomon Islands is vulnerable to droughts and many parts of the country have been affected many times over the past years. Droughts are usually associated with the El Nino phenomenon. In 2015-2016 El Nino caused severe drought conditions on the island of Renell & Bellona, Temotu and Makira/Ulawa province. The sectors affected were Agriculture, Education and water supply, then it cost approximately USD400,000 in relief supplies. El Nino is caused by many parts of the country.

The Solomon Islands must therefore pursue adaptation strategies to cope with the inevitable changes in their climate, while also advocating for strong global action to reduce emissions and mitigate the most severe impacts of climate change. Without concerted global efforts to reduce emissions, the Solomon Islands face a future of more extreme weather, rising seas, and existential threats to their communities and ecosystems.

Vulnerability

Pacific leaders have identified climate change as the single greatest threat to the security, environment, culture, economy and well-being of the region. Solomon Islands is already experiencing the effects of climate change through trends of increasing temperature, decreasing precipitation, changing patterns of weather and extreme events, and accelerated coastal erosion due to rising sea levels. (NCCP, 2023) These changes in climate bring challenges across sectors including agriculture, fisheries, biodiversity, water resources and people's health (MECDM). Solomon Islands' vulnerability to climate change impacts is worsened by socio-economic conditions. Additionally, vulnerable groups such as women, children and the elderly are disproportionately impacted by hazards and climate change.

Economic sector vulnerability:

Agriculture and food security

The Solomon Islands has a very significant agricultural sector, accounting for an estimated 34% of GDP in 2020 (CFE-DM, 2023). The agricultural sector contributes 85% of the country's rural economy. Women play a significant role in household production and selling of produce. It contributes to the local food security as 96% of rural households grow at least some of their own food with crops such as root crops, tubers, and vegetables (WBG, 2021).

People living from subsistence livelihoods suffer the most due to reduced income and food sources following disaster events. For example, post the 2014 flood event, the impacts on agriculture sector affected food availability and cost. Most women engaged in agriculture faced disproportionate effects on earning capacities. The floods affected approximately 52,000 people and internally displaced around 10,000 people.

Climate change impacts on agriculture include rapid onset direct impacts such as those from extreme events such as cyclones and floods as well as slower impacts from temperature changes, salt-water intrusion, and changing patterns of pests and disease infestation. Droughts, floods, storm surges, temperature changes, continuous heavy rain, and prolonged cloud cover can cause stress and shock to crops affecting production through soil nutrient leaching, soil erosion, and low or low-quality yields. In addition, during long periods of bad weather, there is little agricultural activity leading to reduced production.

The Ministry of Agriculture and Livestock (MAL) is integrating risk reduction activities to enhance the sustainability and resiliency of the agriculture sector to the climate-imposed vulnerabilities. The MAL's overarching goal is to lead, collaborate, promote, enhance and improve agriculture development in the Solomon Islands to a profitable and environmentally sustainable future by being the premier provider of information, research, extension, education, regulatory and other services to have a robust agriculture sector.

Tourism

The tourism sector contributed to around 4.6% of the Solomon Islands' GDP in 2022, which marked a significant rebound as the country started to recover from the effects of the COVID-19 pandemic. The Pacific Games held in 2023 also provided a boost to tourism. The sector saw a positive shift with a growing influx of visitors, particularly from countries like Australia, Papua New Guinea, and Fiji. The tourism sector is poised for further growth in the coming years, as the Government has ambitions to significantly increase its relative contribution to the economy, with strategic efforts to attract more international visitors as set out in its 2015–2019 National Tourism Development Strategy.

However, studies on international tourism and climate change highlight the sensitivity of climate change impacts on tourism in small island states, such as the Solomon Islands. Slow onset events such as rising sea levels and coastal erosion could reduce the quantity and quality of available beach space without significant adaptation measures and could therefore reduce the attractiveness of the country as a tourist destination. Another tourist attraction that is highly vulnerable to climate change impacts is the recreational diving sector, which is threatened by environmental degradation, loss of reeds, and coastal erosion. Currently there is very limited knowledge and understanding of the full scale of impacts on the sector and thus further research is required to better constrain the suite of potential climate change impacts on the sector (WBG, 2021).

Fisheries

Fisheries and marine resources play a major role in the national economy and livelihood of the people of Solomon Islands. Fisheries and marine resources are the second largest source of export income after forestry. Most Solomon islanders live in rural areas where nearly half of all women and 90% of men fish and collect resources for food and income (Solomon Islands Government 2009).

Being located in the west Pacific also means it is within the warmest ocean pool of the world where tuna and other offshore migratory species are usually located. Any man-made or natural threats to the fisheries and marine sector will gravely affect the economy of the country and livelihood of its people. Human exploitation and over harvesting of fisheries and marine resources is already an existing threat to this sector. Due to the climate induced changes in temperature, dissolved oxygen and ocean acidity, the maximum catch potential of currently resident marine species has been forecast to decline significantly in the Solomon Islands. The country's fisheries sector faces an especially negative outlook with potential reductions in the maximum catch potential of over 50%, which will pose a major threat to national food security, national income, and dietary health in poorer communities. (CFE-DM, 2023)

Social Vulnerability:

Human Health

Health continues to be a key development issue for Solomon Islands with the government working towards the provision of better health services, especially in rural areas. The health sector will face both direct and indirect risks due to the impact of climate change. Direct impacts include risk of heat-related medical conditions such as heat rash/heat cramps, heat strokes, dehydration in very severe cases lead to death. Extreme weather events increase the demand for emergency health services but can also damage health care facility infrastructure and disrupt service provision. Increased risks of climate-sensitive diseases will also require greater capacity from often already strained health services (WHO, 2019). Health care facilities are often in low-lying areas, subject to flooding and storm surges making them particularly vulnerable. Other indirect health risks of considerable concern include vector-borne diseases, respiratory diseases, waterborne and foodborne diseases, malnutrition, and noncommunicable diseases. (WHO, 2019). The existing socio-economic vulnerabilities such as lack of road connectivity, access to electricity for inland villages, and limited government services further add to the limitations.

Human Settlements

Around 60% of the population live within 1 km of the coast, their location increases their exposure to impacts of sea level rise, storm surges, saltwater intrusion, tsunamis and tropical cyclones. Other existing non- climate factors such as deforestation of mangrove forests, removal of aggregates and poor urban planning, further aggravate the vulnerability of most settlements to climate change (UNDRR, 2023).

High rate of urbanization accompanied by inadequate service provision and poor planning strategies in the past, have resulted in the proliferation of informal settlements, which are estimated to house 35-40% of the inhabitants of the capital city of Honiara. A growing urban population implies a growing need for services and requires an increase in social infrastructure and services, both of which are limited in Honiara's current contexts. The housing sector is highly vulnerable to the impacts of climate change and natural hazards, as nearly 70% of the houses in the country are constructed using corrugated iron, timber, or traditional or makeshift materials. Only 21% of the houses in Honiara and 8% of houses in Guadalcanal are constructed with concrete, cement, or brick floor (UNDRR, 2023). The built environment in Honiara is highly exposed to flooding. There are an estimated 8,011 buildings in Honiara exposed to floods from the Matakino, Lungga, and White rivers, and this includes houses, roads, and critical infrastructure. The impacts from future natural hazards and climate change events are likely to cause large-scale damage to physical infrastructure, due to urbanisation and building new infrastructure to carter the growing population.

The submergence of the country's lowest-lying islands has already begun to threaten coastal communities. A research study conducted in 2016 using satellite imagery dating from 1947 through 2014 and focusing on 33 islands showed that five vegetated reef islands within the country's waters had already disappeared under rising seas. More than 80% of the land in Solomon Islands is customarily owned by tribes and less than 20% is held by Government as Crown land. The Government being a minority landowner has a lot of implications on how to address complex issues such as relocation or resettlement as a result of climate change (NCCP, 2023).

Water and Sanitation

The government reports suggest that 67% of the entire population had access to basic water services as of 2020. However, there was a significant divide regarding access to water between urban 91% and rural 59%. As for sanitation, 2020 data show that 44% of the total population resort to open defecation; access to basic sanitation was 78% in urban areas and 21% in rural areas (CFE-DM, 2023).

SIWA trading as Solomon Water (SW) is mandated to manage urban water supply and sanitation for all Solomon Island provincial capital towns as well as Noro and Munda. SW currently only operates in Honiara, parts of Guadalcanal surrounding Honiara, Noro, Auki and Tulagi. Urban water supply and sanitation for other urban townships is unclear. SW supplies piped water to approximately 65% of households in Honiara. While sewerage is limited only to the main urban area of Honiara around the National Referral Hospital. The majority of urban and industrial areas within Solomon Water's supply catchments are not sewered, and this lack increases risks to water quality and public health. Inadequate access to clean water and sanitation is directly linked to public health issues in the Solomon Islands. Waterborne diseases such as diarrhoea are common, particularly among children, and are a leading cause of mortality.

The Ministry of Health and Medical Services manages and delivers through the Rural Water Supply and Sanitation (RWASH) Programme through the Environmental Health Division. Rural water supply and sanitation remain at high risk to climate change and disaster risks. This is due to water resources located on coastal areas being susceptible to contamination from seawater intrusion during high tides or storm events. The vulnerability of the water and sanitation sector in the Solomon Islands is a pressing issue, intertwined with environmental, economic, and public health challenges.

Vulnerable Groups: Women, Children, Elderly and Disabled

The impacts of climate change disproportionately affect vulnerable groups such as women, children, elderly and the physically challenged. These groups face heightened risks due to existing socio-economic inequalities, limited access to resources, and dependence on climate-sensitive sectors such as agriculture and fisheries. In past disaster events such as the 2013 tsunami and 2014 floods, nearly all casualties were women and children.

Research has also provided more evidence that the effects are not gender neutral, as women, children, people with disability (PWD) and the elderly are among the highest risk groups. According to the Report on Gender 2015 key findings, people with disability are mostly living in rural areas, disability is slightly more common among women (15%) than men (13%).

The majority of households are in rural areas, nearly 96% grow at least some of their own food. Women play a significant role in household production and selling of produce. The country has a relatively high rate of documented violence against women and girls with a reported 64%. They also take on traditional roles in society, such as water collection, food preparation, and caregiving, tasks. These are directly impacted by climate-related disruptions such as droughts, flooding, and resource scarcity. As freshwater sources become more limited due to saltwater intrusion women may have to travel longer distances to find clean water, increasing their workload and exposing them to physical dangers. Similarly, agriculture and food security is threatened by erratic rainfall patterns affecting the health and livelihood of women in the Solomon Islands.

Children in the Solomon Islands are extremely vulnerable to the health impacts of climate change. Climate-related flooding is expected to intensify waterborne diseases. These climate impacts along with existing socio- economic challenges and lack of basic services such as clean drinking water and sanitation, further enhance vulnerabilities particularly in rural areas. For example, diarrheal diseases, already a major cause of child mortality, are exacerbated by contaminated water sources and inadequate sanitation.

Furthermore, extreme weather events such as cyclones and floods disrupt education, as schools are often damaged or repurposed as shelters during emergencies. This leads to prolonged disruptions in children's education, with long-term consequences for their development and future opportunities. Climate-induced food insecurity also increases malnutrition rates among children.

Recognizing these issues, the Government has introduced significant national-level legislative and policy steps such as the Women's Resilience to Disasters Programme was launched collaboratively by the Solomon Islands Government, Australia Aid, and UN Women in May 2023, the Child and Family Welfare Act of 2017, Solomon Islands National Youth Policy 2017-2030, and the Strategic Framework for Youth Development and Empowerment in Solomon Islands of 2017. The new National Climate Change Policy (NCCP) 2023-2032 also aims to prioritize the needs and respect the rights of the most vulnerable, women, persons with disabilities, children, youth and older persons, and facilitate their effective participation in planning and implementation of interventions (NCCP, 2023).

Methodologies, tools and associated uncertainties and challenges:

The Solomon Islands faces several uncertainties and challenges in climate change prediction and vulnerability assessments, primarily due to limited data availability, technical capacity constraints, and the complex nature of island ecosystems. Incomplete or inconsistent historical climate and socio-economic data hinder accurate modeling and trend analysis. The country also lacks high-resolution, localized climate projections, making it difficult to assess the full extent of future risks at the community level. Technical and institutional capacity limitations further constrain the development and application of advanced climate models and vulnerability assessment tools. Additionally, the remote and fragmented geographic location of Solomon Island makes it challenging to develop localized response planning. These challenges contribute to uncertainties in projecting climate impacts and in identifying the most vulnerable populations and sectors, thereby complicating efforts to design targeted adaptation strategies.

Adaptation priorities and barriers

Priority Sectors identified for Adaptation Action

The Solomon Islands National Adaptation Programme of Actions (NAPA) 2008 identified areas for urgent and immediate needs for adaptation derived from the sectoral reports produced by the NAPA Team. In the new National Climate Change Policy 2023-2032, these still remain key priority areas for the Solomon Islands, due to limited coverage of implementation of policies and plans within the whole country. During the design of the first NAPA, Ecosystem-based Adaptation (EbA) was not factored in. Hence, its realization makes EbA a new priority measure for NAPA thus, its integration into development projects is critically essential.

Table 3: Adaptation priority sectors and relevant policies

No.	NAPA Priority Sectors	Sectoral Policies	Institutional Authority /Ministry
1.	Agriculture and Food Security	• National Agriculture and Livestock Sector Policy 2009-2014 • National Food Security, Food Safety and Nutritional Policy 2010-2015	Ministry of Agriculture and Livestock (MAL)
2.	Water and Sanitation	• Solomon Islands Rural Water Supply, Sanitation and Hygiene Policy 2014 • Solomon Islands National Water Resources and Sanitation Policy 2017 • RWASH Community Development Guidelines • National Water Policy • WATSAN Policy • Solomon Water 30 years Strategic Plan	Solomon Islands Water Authority (SIWA) / Solomon Water (SI)
3.	Human Settlement and Human Health	• National Disaster Management Plan 2018 • Health impacts of climate change in the Solomon Islands: An assessment and Adaptation Action Plan 2011	Ministry of Health and Medical Services (MHMS) and Ministry of Infrastructure Development (MID)
4.	Education	National Education Action Plan (NEAP) 2016-2020	Ministry of Education and Human Resources Development (MEHRD)
5.	Awareness and Information	National Information and Communications Technology (0ICT) Policy 2017	Climate Change Division of the MECDM has a Senior Communications Officer and a Chief GIS Research Officer who are responsible for knowledge, information and communications.
6.	Waste Management	National Waste Management and Pollution Control Strategy 2017-2026	Ministry of Environment, Climate Change, Disaster

			Management (MECDM)
7.	Coastal Protection	National Climate Change Policy 2017	Ministry of Environment, Climate Change, Disaster Management (MECDM)
8.	Fisheries and Marine Resources	• National Ocean Policy 2018 • Coral Triangle Initiative (CTI) Policy • Ocean Policy	Ministry of Fisheries and Marine Resources (MMFMR)
9.	Infrastructure Development	• National Development Strategy 2016-2035 • Infrastructure Policy • National Building Codes	Ministry of Infrastructure Development (MID)
10.	Tourism	Solomon Islands National Tourism Policy 2015 – 2019	About the Ministry of Culture and Tourism (MCT)

Key Adaptation Actions for each priority sector

The main guiding framework for adaptation specific plans and actions for the Solomon Islands is the 2008 National Adaptation Programme of Action (NAPA), the National Disaster Management Plan 2018, National Development Strategy 2016-2035 and the latest National Climate Change Policy 2023-2032.

Table 4: Adaptation priority sectors and key adaptation actions

Priority Sector	NAPA Adaptation Action	Overarching Adaptation measure	Key Sector Specific Projects	Common / Cross-cutting project
Agriculture and food security	Increase the resilience of food production and enhance food security to the impacts of climate change and sea-level rise.	Reduce the impact of climate change, disaster and environmental risks on the food and agricultural sector.	SWoCK (Strongim Waka blo Kakai lo community),	Tsunami School Ready Climate Early Warning System (CLEWS) Community Resilience to Climate Change and Disaster Risk in Solomon Islands Project (CRISP)
Water and Sanitation	Increase the resilience of water resources management to impacts of climate	Improve water security and Sanitation in Solomon Islands	Solomon Islands Water Sector Adaptation Project (SIWSAP),	

	change and sea-level rise.		Climate Change Adaptation Program (CCAP)	Pacific Climate Change Science Program (PACCSP) Pacific-Australia Climate Change Science and Adaptation Planning (PACCSAP) Solomon Islands Adaptation Programme (SICAP) The Pacific Climate Change Science Program (PCCSP)
Human settlement and Human Health	Improve the capacity for managing impacts of climate change and sea-level rise. Increase the capacity of health professionals to address adverse impacts of climate change on human health.	Improve physical vulnerability and strengthen health sector adaptive capacity	UNHABITAT Project	
Education	To promote climate change education, awareness and information dissemination.	Integrate climate change in all curriculum development and climate proof education infrastructure building codes		
Awareness and Information	To promote climate change awareness and information dissemination.	Dissemination of climate change information reach all level (national, subnational and community) throughout Solomon Islands	Featured in project components and CCD annual activity,	
Low lying and artificially built islands	To facilitate adequate adaptation to climate change and sea-level rise.	Relocation framework in place for Solomon Islands	SWoCK (Strongim Waka blo Kakai lo community), Coastal Community Adaptation Project (CCAP)	
Waste Management	To better manage impacts of climate change on waste management	Waste management issues through an integrated and sustainable approach, which	J-Prism (Project for Promotion of Regional Initiative on Solid Waste Management in	

		includes improving understanding of at-risk waste sites	Pacific Islands Countries)	
Coastal Protection	To increase the resilience and enhance adaptive capacity of coastal communities, socio-economic activities and infrastructure	Integration of hard and soft (grey/green) measure as cost effective measures for coastal/ shoreline protection		
Fisheries and Marine Resources	To improve the understanding of the effects of climate change and climate variability including El Nino-Southern Oscillation on the inshore and tuna fishery resources	To improve the understanding of the effects of climate change and climate variability including El Nino-Southern Oscillation on the inshore and tuna fishery resources		
Infrastructure Development	To improve the resilience of key infrastructure to climate change and sea-level rise.	To improve the resilience of key infrastructure to climate change and sea-level rise.	Solomon Islands Roads and Aviation Project SIRAP1, SIRAP2	
Tourism	To integrate climate change adaptation strategies and measures into tourism planning and development.	Establishment of a framework of responsibility that positively and proactively addresses the issues of climate change and DRM on environmental sensitivity, social engagement and economic returns for the community and safeguarding host communities' preparedness.		

Challenges and Barriers for Adaptation Actions

The need to implement adaptation measures with urgency has been often reinforced by the adverse impacts already being experienced in the country. However, Solomon Islands is confronted by many challenges mainly insufficient resources, uncertainties over climate change projections and adaptation strategies, limited technical and institutional capacities (NAPA, 2008).

Government does not currently have the capacity to manage and effectively coordinate the implementation of the projects on the ground. These challenges require strong partnerships and coordination among government, development partners, and stakeholders to resolve (PCCFAF, 2017).

Although national strategies and provincial plans are formulated, the government lacks adequate financial and technical support to successfully implement the activities at provincial and community level. Provincial governments are generally hindered with financial and human resource constraints to implement these priorities and rely on external funding.

There is a lack of institutional coordination and integration between national and local level institutions. For example: Solomon Islands Meteorological Services (SIMS) provides early warnings for severe weather, climate and ocean forecasting, but lacks capacity for flood forecasting. The overall water management belongs to the Water Resources Department under the Ministry of Mines and Energy (MME) and there is a lack of coordination with SIMS and MME. Greater coordination between agencies is needed to avoid overlapping mandates, improve service delivery, and increase efficiency (UNDRR, 2023).

Solomon Islands NDC submitted in 2021 also highlights the need for Adaptation knowledge sharing, coordination and collaboration among ministries as well as with non-governmental organizations (NGOs), the private sector, faith-based organizations and development partners. Cultural or traditional norms such as “Kastom” of local indigenous communities also hamper awareness and action as with very limited capacity at the community level to undertake local level vulnerability mapping, adaptation planning and the implementation of priority adaptation interventions. There is need to translate the climate science and predicted impacts into messages that support action by Solomon Islanders. (MECDM 2016)

The dispersed geography and remoteness of the islands restricts development of communication infrastructure. Limited access to the Internet throughout the country except in urban areas; pamphlets not translated into Pidgin and provincial dialects, and low levels of literacy, make it difficult for climate risks and hazard information to reach the public.

Further, the frequency and intensity of the impacts of climate change and natural hazards adds another layer of complexity to Climate change adaptation and disaster risk reduction plans and implement priorities.

Adaptation strategies, policies, plans, goals and actions to integrate adaptation into national policies and strategies

Adaptation strategies, policies, plans

The Government is addressing climate change in the country by implementing the convention, developing various polices and strategies under the climate change division. This includes the National Adaptation Programme of Actions (NAPA 2008); first National Climate Change Policy (NCCP 2012-2017);; first National Communication; Second National Communication (SNC) 2017, Third National Communication (TNC) 2024, Nationally Determined Contribution (2021) and the latest revised National Climate Change Policy (NCCP 2023-2032) along with other related sectoral policies and strategies. The government also mainstreamed climate change in its National Development Strategy (NDS 2016 2035). The fourth objective of the NDS focuses on building community resilience. Figure 8 below illustrates where the New Climate Change Policy sits within the country's overall development and climate change programming.

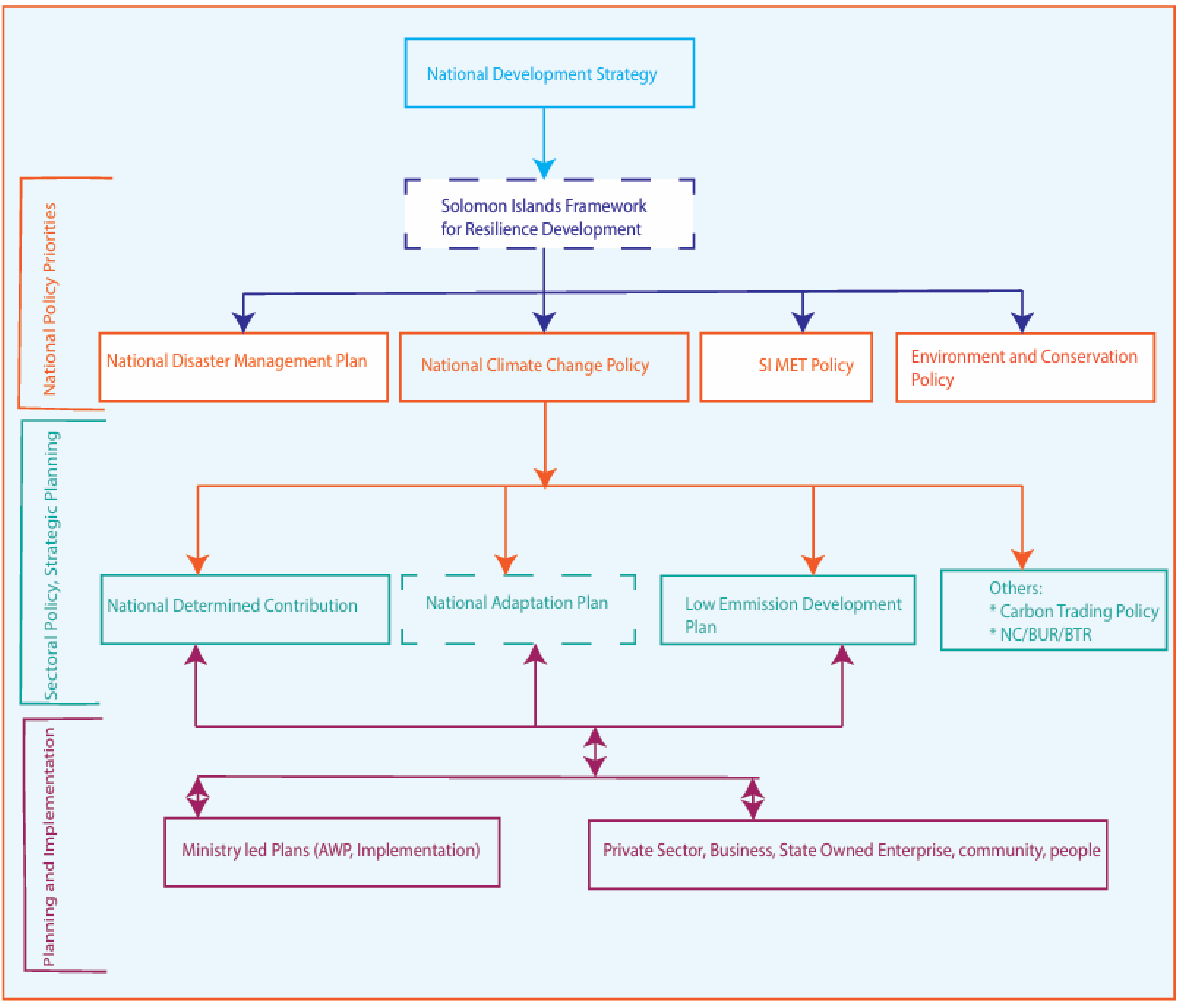


Figure 8: Climate Change Policy Linkages (NCCP 2023-2032)

Key Sector Plans, Strategies and Policies relevant to climate adaptation in the Solomon Islands:

National Development Strategy 2016-2035

The Solomon Islands National Development Strategy (NDS) 2016-2035 is the country's main development strategy, with the vision to improve the Social and Economic Livelihoods of all Solomon Islanders. It sets out five wholistic development objectives. Of the five, objective four is the most relevant to the MECDM's work pertaining to climate adaption is: "Resilient and environmentally sustainable development with effective disaster risk management, response and recovery". It presents a visionary strategy for the next twenty years, setting out a long-term vision that reflect the aspirations of all Solomon Islanders. Adaptation oriented mid-term strategy for achieving the longer term NDS objectives includes "Expand and upgrade weather resilient infrastructure and utilities focused on access to productive resources and markets and to essential services". Similarly, its medium-term strategy #10 has focus to "improve disaster and climate risk management including prevention, risk reduction, preparedness, response and recovery as well as adaptation as part of resilient development." (NDS).

National Disaster Management Plan- 2018

The National Disaster Management Plan (NDMP) 2018 is a comprehensive whole-of-government plan that sets out arrangements for disaster management. It aims to integrate disaster risk reduction and climate resilience at the national, provincial and local level. The plan separates the functions for disaster management such as planning, preparedness, response, and recovery from those for resilience to climate and disaster risks. It proposes a framework for resilient development that is parallel to and separate from disaster management which deals mainly with episodic disasters. The proposed framework aims to provide an integrated institutional enabling environment for the integration of climate change adaptation and disaster risk reduction across all sectors (UNDRR, 2023).

National Climate Change Policy 2023 – 2032

The National Climate Change Policy (NCCP) (2023- 2032) with the vision for a resilient, safe and low carbon emitting Solomon Islands, is intended to guide anticipatory and response measures to deal with the impacts of climate change and to capitalize on opportunities to strengthen low emission resilient development pathways. The opportunity to achieve the above will be taken through adaptation, addressing loss and damage, and mitigation measures. Most of the Governments policy objectives from the first NCCP (2012-2017) have not been implemented. However, many of these objectives still remain pertinent today and form part of this National Climate Change Policy outcomes, directives and strategies such as aims to enhance the country's adaptive capacity while pursuing a path of low-carbon development (NCCP, 2023).

Table 5: National Climate Change Policy Outcomes

No.	Policy Outcome	Policy Directives	No. of Strategies
1.	Enabling legislative and institutional frameworks in place	An effective and good governance framework to lead, coordinate and implement an integrated and multi-stakeholder participatory approach to addressing the climate change emergency.	6
2.	Key vulnerabilities are addressed adaptation and risk resilience	Strengthen the capacity and ability of the people, natural environment, and economy to be resilient	7
3.	Mitigation is driven by strengthening net zero emission whilst economic growth and resilience are enhanced	Solomon Islands strengthens its net zero emission status and pursue further efforts to reduce GHG emissions in key emitting sectors, while protecting and enhancing GHG sinks, and develop new low-emission economic opportunities.	10
4.	Loss and Damage addressed	Loss and damage is already evident and it must be assessed and addressed by advocacy and mobilization of external and domestic resources to address it.	5
5.	National reporting obligations on climate change are met	Ensure that Solomon Islands meets its climate change reporting obligations at the national, regional, and international levels.	3
6.	Technical capacities for assessment, technology and finance mobilisation, and mainstreaming of climate change actions enhanced	SIG and stakeholders strengthen their capacities for assessment, to mobilize finance and technology, and mainstream climate change actions across all sectors.	16

Nationally Determined Contribution 2021

Solomon Islands submitted its revised and more ambitious Nationally Determined Contribution (NDC) in 2021. Solomon Islands has also included Adaptation in its revised NDC because mitigation and adaptation are inseparable for a low emitting, highly vulnerable and small island developing country. Given the very high vulnerability to impacts of Climate Change, Solomon Islands takes adaptation as a matter of survival and not just an option. Short to medium term adaptation priorities are set out in the country's National Adaptation Programme of Action 2008 and long-term adaptation plans will be captured in the upcoming new National Adaptation Plan.

Adaptation priorities listed in the NDC:

- Review and revise the National Adaptation Programmes of Action (NAPA) and National Adaptation Plan (NAP) to address climate change over the short, medium and long term.

- Develop a Resilient Development Framework for climate change adaptation and disaster risk reduction at national, provincial and community levels.
- Capacity building and Integration of Adaptation Actions: Strengthen institutional and community capacities, including government, NGOs, churches, and local groups on climate adaptation and disaster risk reduction.
- Conduct risk and vulnerability assessments in urban centers such as Honiara and other key economic zones; develop and implement targeted adaptation actions.
- Gender and Social Inclusion: conduct gender analysis and ensure the integration of gender considerations into all assessments and adaptation efforts.

National Adaptation Plan

As mentioned in its NDC 2021, the government od Solomon Island aims to develop a robust National Adaptation Plan. The lead agency responsible for climate change policy and action in Solomon Islands - MECDM (with its Permanent Secretary being the National Designated Authority for Green Climate Fund (GCF)) developed its NAP Readiness proposal for GCF. As seen in the nation policy linkage figure above, currently, the country is in the process of securing financial and capacity building support for developing its National Adaptation Plan.

Action to integrate climate change plans, policies at subnational and community level

MECDM embarked on an ambitious pathway towards developing a national Framework for Resilient Development. This work was funded with technical funding support from the Global Environment Facility, the Global Fund for Disaster Risk Reduction and the Japanese Human Policy Development Resource Fund with technical implementation support from the World Bank. Funds were managed by the World Bank through the Community Resilience to Climate and Disaster Risk in Solomon Islands Project (CRISP) that was executed by the MECDM. A "Position Paper for the Development of the Framework for Resilient Development for Solomon Islands – Final Draft" dated 25 May 2018 was completed setting out issues and proposing options for discussion by the National Disaster Committee Sub-Committee in 2018. This work was also supported by the UNDP managed Pacific Risk Resilience Program that was executed within the Ministry of Development Planning and Aid Coordination.

At the Provincial level, governments that have integrated climate change into their policies and plans include Choiseul, Temotu, Western and Malaita Provinces. Choiseul Province has developed their specific Mid-term Development Plan 2012-2014 and has developed the Choiseul Province 2012 Climate Change Ordinance. The Choiseul Province Integrated Climate Change Program (CHICCAP) supported the province with a lot of their climate integration work. The Town and Country Planning Amendment Act 2017, and the Honiara City River Bank Ordinance of 2014 serve as legal basis for climate change integration within Honiara City programmes.

Temotu Province and Central Provincial governments corporate plans make references to the vulnerabilities of their sectors to climate change however lacks climate change ordinances.

Specific Provincial integration work is project driven and often not sustained when projects close. Climate change projects that have implemented provincial integration work include; Community Resilience to Climate Change and Disaster Risk in Solomon Islands Project (CRISP), Choiseul Province Integrated Climate Change Program (CHICCAP) projects to name a few. These projects worked in partnerships with the Provincial governments of Temotu, Central, Malaita, Makira, Choiseul, Western and Isabel Provinces on risk resilient development around structural and non-structural investments. The World Fish and the Coral Triangle Initiatives were also implemented in Western Province focusing on community-based adaptation.

The MECDM has implemented the Solomon Islands Integrated Vulnerability Assessment Tool to conduct vulnerability assessments at the Provincial level to support provincial governments develop their Provincial Climate Change Policies.

Action to integrate available science and traditional knowledge into adaptation strategies

The government further realized this aspiration for climate change integration by developing the National Adaptation Program of Action (NAPA) to facilitate the integration of climate change issues into national development plans and strategies. The government is conducting Integrated Vulnerability Assessment (IVA) studies across various provinces and communities to support National Adaptation Plan (NAP) for Solomon Islands. This will also help the county integrate available science, indigenous, traditional and local knowledge into its adaptation actions and plans.

Integrated Vulnerability Assessments (IVAs) Methodology and Tools

The IVA Framework was developed in 2017 by Pacific organizations in response to a perceived need to support a standardized, coordinated and integrated approach to assessing climate vulnerability in the region. The IVAs are critical tools for gathering localized data on community vulnerabilities, contributing to informed, climate-resilient development planning at multiple levels—national, sectoral, and community. Several Pacific Island countries have chosen to use integrated vulnerability assessments (IVAs) to capture and incorporate community-level vulnerability information into their National Adaptation Plan (NAP) processes.

The IVA methodology is designed to create a standardized, multisectoral approach for assessing climate vulnerability. It combines both participatory and scientific techniques to collect data on how environmental and developmental changes impact communities. IVAs collect data across five categories of livelihood assets (LAs)–natural resources, infrastructure, finance, human resources, and governance—and analyse how climate change affects these assets. The assessments focus on seven human security objectives (HSOs), such as food, water, and income security, providing a comprehensive understanding of how communities are impacted. This creates an IVA Framework is comprised of 35 intersecting components of five livelihood assets cross-referenced with seven human security objectives. The figure below provides some examples of these intersections.

Human Security Objectives	Livelihood Assets				
	Natural Resources (n)	Infrastructure and Services (i)	Finance (f)	Human Resources (h)	Institutions and Governance (g)
Ecosystem Health (E)	**En:** Natural resources for ecosystem health security	**Ei**	**Ef**	**Eh**	**Eg**
Community Health (H)	**Hn**	**Hi:** Infrastructure & services for community health security	**Hf**	**Hh**	**Hg**
Security of Place (P)	**Pn**	**Pi**	**Pf:** Finance for security of place	**Ph**	**Pg**
Water Security (W)	**Wn**	**Wi**	**Wf**	**Wh:** Knowledge & skills for water security	**Wg**
Food Security (F)	**Fn**	**Fi**	**Ff**	**Fh**	**Fg:** Institutions & governance of food security
Income Security (I)	**In**	**Ii**	**If**	Ih: Knowledge & skills for income security	**Ig**
Energy Security (N)	**Nn**	**Ni**	Nf: Finance for energy security	**Nh**	**Ng**

Figure 9: Intersecting components of the IVA Framework

The latest vulnerability assessment tool is the Solomon Islands Integrated Vulnerability Assessment (SIIVA) which is used by Climate Change Division of MECDM. The SIIVA assesses vulnerability in an integrated approach. It adopts the conceptual approach from the Pacific Islands Integrated Vulnerability Assessment IVA Framework 2017, acknowledging that adaptive capacity to climate change vulnerabilities is a multi-faceted concept that incorporates strengths across several disciplines.

SIIVA measures the adaptive capacity to climate change and natural disasters based on the extent to which communities can access five Livelihood Assets (LAs) necessary to meet Nine Human Security Objectives (HSOs), complemented with GIS mapping and coastal profiling. The five LAs are 1) ecosystem, 2) infrastructure and services, 3) finance, 4) human resources, and 5) institutions and governance. The nine HSOs are 1) food security, 2) water security, 3) income security, 4) energy security, 5) security of a place, 6) community health, 7) watershed health, 8) coastal health, 9) forest health. Accordingly, the SIVA Framework comprises 45 intersecting LA-HSO components that collectively represent a community's ability to meet their human security needs at a particular point in time.

In the Solomon Islands, for instance, the IVA process is instrumental in helping local communities and policymakers identify critical vulnerabilities and prioritize adaptation strategies. The participatory nature of IVAs ensures that community voices, particularly those of women and marginalized groups, are integrated into national adaptation efforts. In 2023, International Organization for Migration (IOM) assisted MECDM in conducting IVAs for three communities in Western Province and is expected to conduct IVAs for an additional six communities in Temotu and Isabel Provinces in 2024 and 2025 (SIBC, 2024).

Progress on implementation of adaptation actions

Implementation Status of Adaptation actions

The Government of the Solomon Islands understands the severity and urgency to address impacts of climate change. To show its commitment towards achieving the NDC,2021 targets, the government is developing an NDC Investment Plan. This Nationally Determined Contribution (NDC) Investment Plan, including pipeline of opportunities, has the overall goal to enhance the Government of the Solomon Islands ability to implement mitigation and adaptation opportunities within renewable energy, land transport, forestry and waste sectors. To meet this goal, this NDC Investment Plan defines five objectives, which provide a strategic approach to financing the mitigation and adaptation opportunities presented in this plan. The activites in the NDC Investment plan are yet to be implemented, based on availability of resources and technical capacities.

It is noted that the mitigation and adaptation opportunities defined in this NDC Investment Plan are aligned with the Solomon Islands Long-Term Low Emissions Development Strategy (LEDS) and National Development Strategy 2016-2035 and the National Climate Change Policy 2023-2032.

The fourteen mitigation and adaptation opportunities presented in this NDC Investment Plan consist of five opportunities within renewable energy, four within land transport, three within forestry, and two within waste (* Waste sector opportunities part of the NDC Investment Plan are not part of the NDC,2021 actions).

Table 6: NDC Implementation Plan and resultant Adaptation outcomes

NDC target sectors	NDC Investment Plan Opportunities	Adaptation Outcome
Renewable Energy	• Set-up three Hydro-power stations • Solar Mini-Grids for Public Schools and Institutions • Solar Micro-Grids for Tourism Sites	• Resilient Power Systems • Increased Energy Security for local Communities

Land transport	• Resilient Roads Improvement Programme • E-mobility for buses in the Honiara area • Local alternative/Biofuel for ICE vehicles	• Resilient transport infrastructure increases the community adaptive capacity. • Resilient Road and Bridge design
Forestry	• Promotion of Community Forestry for Livelihoods • Eco-system Based Restoration of Degraded Forest Land Areas • Increasing the Growth of Mangrove Forests	• Enhanced Community empowerment and livelihood security • Nature based Solutions
Waste *	• Waste Management in Lata and Buala Area • Biogas Production in Rural Communities and Farms	• Resilient waste management infrastructure

In addition to the actions identified in the NDC Investment plan, some of the recent adaptation actions initiated in Solomon Islands aligned with adaptation goals in the NAPA and NDC are listed below:

Scaling up Climate Ambition on Land Use and Agriculture through Nationally Determined Contributions and National Adaptation Plans programme (SCALA)

This program supports Least Developed Country (LDC) and Small Island Developing State (SIDS) countries to build adaptive capacity and reduce greenhouse gas emissions to meet targets set out in their National Adaptation Plans (NAPs) and nationally determined contributions (NDCs). The program helps to translate their NDCs and NAPs into transformative climate action and scale up adaptation actions in the Country. Co-led by FAO and UNDP with funding from the Government of Germany. In July 2022, the Government of the Solomon Islands expressed their interest in receiving support from the SCALA programme, through assistance to conduct a feasibility study to set up a biogas plant using pig waste at farm level with the aim of providing sound technical basis to have a lasting impact at farm and community level, contributing to the target of substituting firewood from mangroves for cooking by fostering clean energy production. A two-tiered approach is being used to assess the feasibility of biogas production from pig manure and agricultural residues. Tier 1 involves a pilot farm case study to evaluate the biogas potential using available technologies and site conditions. If results are positive, Tier 2 will focus on detailed planning, engineering, and procurement for a biogas plant. If feasibility is not demonstrated, a sensitivity analysis will identify the limiting factors. Currently the tier 1 feasibility assessment has been completed.

Solomon Islands Adaptation Programme (SICAP)

With funding support from the European Union (EU) this program aims to support the Solomon Island Government to contribute to climate change adaptation and reduction of vulnerability of communities living on low-lying atolls, artificially built islands and other low lying coastal areas in

Solomon Islands. The main objectives of the project is to assist SIG in mainstreaming climate change and disaster risk reduction into national policy and budget, develop institutional capacities within the Ministry to implement the National Disaster Risk Management Plan for Disaster Management and Disaster Risk Reduction including for Climate Change (NDRMP), and contribute implementing Priority One of the national Adaptation Programme of Action (NAPA), focused on the resettlement of people as a response to sea level rise, changes in rain patterns, waves and tropical cyclones resulting from climate change.

Monitoring and evaluation of adaptation actions and programs

Monitoring, Reporting, and Verification Framework for Adaptation

The government, in alignment with the Paris Declaration commits to "Managing resources and improving decision making for results." Improvements have been made in the Solomon Islands Government planning approach with the adoption of the Integrated Monitoring Reporting and Verification (iMRV) tool to efficiently collect, monitor and report data on greenhouse gas (GHG) emissions, national mitigation efforts, climate adaptation actions and climate finance. Additionally, the tool also tracks progress on Sustainable Development Goals (SDGs) and National Development Goals (NDGs), ensuring that the support provided to Solomon Islands aligns with the nation's climate priorities.

Given that Climate Change Adaptation is critical for Solomon Islands the iMRV tool has a dedicated adaptation tacking module with emphasis on Monitoring Reporting and Verification as well as Learning of adaptation, fostering learning about their adaptation policies and actions.

Table 7: Information on iMRV adaptation module

iMRV tool	Specific Information (Adaptation Module)
System characteristics	• The Adaptation module of the iMRV tool has been specifically designed to monitor national, regional as well as provincial level adaptation actions. The tool allows for flexibility in monitoring actions aligned with NDC, NCCP, NDS and other national development priorities. • The tool monitor progress towards adaptation project goals and targets specified in the project with the help of quantitative and qualitative indicators. • The outcomes of the progress in the form of monitoring and evaluation reports transparently demonstrate progress made towards the targets defined in the national policies and frameworks such as NDCs, Climate Change Action Plans and other development strategies.
Operational status	The tool has been developed and launched in the country in 2024 and is completely operational.

Results, challenges, barriers and gaps, support needs, and good practices and lessons learned	• One of the major issues that is inhibiting the speedy operationalization of the system is the lack of well-trained skilled resources. • Limited infrastructure and technical capacity: for successful functioning of the tool, infrastructure to support the digital tool is required.
Future developments	Depending on the requirement and needs of the country Update or expansion of the system is possible in the future.

Even with its limited capacity and lack of adequate resources the Government is taking measures to address climate change impacts across the country. This section highlights the outcomes and impacts of the Climate Change Adaptation and Disaster Risk Reduction actions implemented example of the CRISP Project.

CRISP Project

The CRISP (Community Resilience to Climate and Disaster Risk) Project was designed to support the government of Solomon Islands address key priorities identified in its National Adaptation Program of Action (NAPA) and reflecting its vulnerability. The CRISP project was implemented by the Ministry of Environment, Climate Change, Disaster Management and Meteorology from the years 2013 to mid-2020 in partnership with the World Bank. The project aims to help communities in the Solomon Islands better manage natural hazards and climate risks through three main components (GFDRR, 2018):

Table 8: CRISP project key components and achievements

Nos.	Project Key Components	Results Achieved
1.	Enhance DRR and CCA investments at the community and provincial level for-community shelters, improved water supply, storage systems, infrastructure resilience, coastal protection, cyclone strengthening of buildings, foundation raising for flood alleviation, and shoreline protection systems.	• Total, 53,400 people have benefitted from these provincial and community resilience sub-projects. • Over 48 community resilience sub-projects are being rolled out across the provinces of Guadalcanal, Temotu, Malaita and Central, in addition to four provincial-led resilience sub-projects. • sub-project in the village of Nanggu has built 15 water standpipes, providing water to 700 residents enhancing their water security and strengthening their ability to cope with natural hazards and climate change.
2.	Establishment of an early warning network and enhancement of seismic monitoring system	• The refurbishment of the base station for the national seismic warning system has been completed.

		• Construction of four seismic sheds in provincial sites. • The installation and testing of the seismic monitoring infrastructure to be completed.
3.	Support CCA and DRR mainstreaming in government policies and plans both at the national and provincial level.	• Progress on integrating DRR and CCA into sectoral planning for three ministries: the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), the Ministry of Health and Medical Services (MHMS) and the Ministry of Tourism and Culture (MTC). • MHMS has developed an annual work plan and budget with CCA and DRR inclusions. • 59 communities have developed community-based disaster risk management plans.

A total of 82 structural investments was implemented in vulnerable communities at a cost of USD 5.45 million.

Challenges and lessons learned:

- CRISP placed a heavy emphasis on the use of participatory planning, this ensured that women and girls can influence decision-making in the preparation and implementation of community-level activities.
- Partnerships can help overcome the challenge of operating in remote areas. Project sites for CRISP were located in very remote locations which were not frequently serviced by air and shipping transportation. The World Bank-funded Rural Development Program (RDP) was implemented concurrently with CRISP. Through this collaboration, staff from the RDP supported CRISP in procuring needed goods and materials.

Loss and Damage: Information related to averting, minimizing and addressing loss and damage associated with climate change impacts

As the impacts of climate change become increasingly evident, the concepts of loss and damage (L&D) emerge as critical components of understanding and addressing this global crisis. Although there is no clear definition for the term. A general accepted meaning for Loss refers to the permanent or irreversible impacts of climate change, such as the extinction of species, the destruction of ecosystems, and the loss of cultural heritage. While damage pertains to the monetary and physical impacts, such as property destruction, loss of livelihoods and degradation of infrastructure.

For the Solomon Islands, importance of recognizing loss and damage cannot be overstated. To give an example, fully functional and liveable islands such as Kale, Fanalei and Walande have gone under water in the lifetime of a first-year student at Solomon Island National University and people have been displaced. Sea level rise and other climate change impacts have taken away an irreplaceable part of livelihood, life and culture that once thrived there. The loss of these islands is just a sub-set of a broader cluster of L&D issues arising from both rapid and slow on-set impacts of climate change affecting both natural and human systems.

Past disasters (EM-DAT) (1970 - 2021)

	Number of events (Events)	Number of deaths (People)	Number of affected (People)	Number of damaged (USD, Millions)
Drought	3		380	
Floods	5		90,080	26.0
Tropical cyclone	14	164	472,771	22.0
Tsunami	3	262	5,713	2.0
Earthquake	4	35	12,397	

Figure 10: Solomon Island Disaster Data 1970-2021(ESCAP)

Observed and current Loss and Damage

According to reports form United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)[21] data from the International Disaster Database (EM-DAT) covering the period 1970–2021, tropical cyclones have been the most frequent and damaging hazard in the Solomon Islands, with 14 events affecting over 472,000 people and resulting in economic losses of approximately 22 million USD. Floods have also caused significant destruction, leading to the highest recorded financial damage at around 26 million USD and impacting more than 90,000 people. Moreover, disaster risks in Pacific Small Island Developing States (SIDS), including the Solomon Islands, are being reshaped by interconnected and compounding hazards within a growing disaster-climate-health nexus. This evolving risk is driven largely by an increase in climate-related hazards, such as tropical cyclones, droughts and floods in recent years. This raises concerns that progress in Climate change adaptation and disaster risk reduction may be undermined by escalating climate variability.

[21] United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP) Country Profile Solomon Islands.

COUNTRY	TOTAL AAL, MILLIONS OF US DOLLARS	GDP, 2017, MILLIONS OF US DOLLARS	TOTAL AAL AS A PERCENTAGE OF GDP
Solomon Islands*	79.00	909.3	8.69

Source: ESCAP calculations based on probabilistic risk assessment.
*Note: The figures for Papua New Guinea and Solomon Islands do not include losses due to agricultural drought.

Figure 11: Solomon Island Average Annual Loss due to disasters (ESCAP)

Solomon Islands faces significant economic losses due to natural and climate-related hazards. ESCAP estimates the country's average annual loss (AAL), which include both losses due to intensive risk and those due to extensive risk, indirect losses and slow-onset disasters. The Solomon Islands Total Average Annual Losses (AAL) due to climate change is 79 million USD, equivalent to 8.69 % of the nation's GDP. This figure does not account for losses from other hazards such as floods and droughts, suggesting that the total AAL could be higher.

A single extreme weather event can wipe out developmental progress that take several years to achieve. Notably, the 2014 floods alone resulted in damages estimated at 107.8 million USD, equivalent to 9.2% of the Solomon Islands' GDP at the time.

Type of Loss and Damage

Loss and damage caused by climate events can be divided into two categories Economic and Non-Economic:

- Economic loss and damage: as the name indicates, this category focuses on loss and damages that can be assigned a monetary value and include, for example, the loss of earnings or productivity and damages to property or GDP.
- Non-economic loss and damage – loss and damage that are difficult to assign a monetary value for example losses to biodiversity and cultural heritage, health and mental trauma, loss of life. These are the intangible impacts of climate change on the people and ecosystems.

In the Solomon Islands, climate change has led to both economic and non-economic losses and damages, with impacts expected to intensify in the coming decades. Some examples under both categories have been mentioned below.

Economic Losses

- Infrastructure Damage: Extreme weather events such as the 2014 flash floods caused damages exceeding 107.8 million US and about 9.2% of national GDP—destroying approximately 675 houses and the food gardens, roads, bridges and schools.
- Agriculture and Fisheries: Saltwater intrusion, droughts, and changing rainfall patterns reduce crop yields and fish stocks, affecting food security and income for rural

communities. The Asian Development Bank study estimated an economic loss of up to 4.7% of annual GDP in Solomon Islands by 2100 brought on climate-linked impacts on agricultural and fishing industries.

Non-Economic Losses

- Loss of Land and Habitats: Rising seas have submerged entire islands and eroded coastlines, leading to permanent loss of ancestral land and ecosystems. In 2016, 5 uninhabited islands in Solomon Islands, were reportedly completely submerged. Others, inhabited by very small communities, were significantly eroded leading to permanent displacement. In 2007 around 4.6% of the population (24,000 people) was displaced as a result of a tsunami, leading to significant damage to the country's economy as well as loss of life.
- Cultural and Social Disruption: Displacement and land loss threaten traditional customs, community cohesion, and spiritual values tied to the land.

Actions planned or implemented to address loss and damage

Government in its NCCP 2023-2032 has the mission to scale up adaptation and risk resilience actions, address loss and damage and strengthen low emission pathways by 2032. The policy outlines six main objectives. Given the intensity of L&D in Solomon Islands, the government has allocated one of the policy objectives specifically to: address Loss and Damage. The aim is to address L&D by advocacy and mobilization of external and domestic resources. Key strategies focusing on Loss and Damage under the National Climate Change Policy include:

- Developing local and national capacity and knowledge of loss and damage from both rapid and slow onset impacts and assess options for intervention.
- Strengthen Advocacy for the operationalization of loss and damage funding mechanism and speedy mobilization of resources for targeted actions and interventions.
- Proactively engage with key external and internal partners to mobilize resources for relocation of vulnerable communities such as low-lying atolls and coastal areas.
- Empower Government relevant ministry - Ministry of Lands, Housing and Survey- to facilitate identification of land for relocation of vulnerable communities.
- Facilitate means of implementation including finance, science and technology, and capacity building for loss and damage through national and international support.

While the Solomon Islands National Climate Change Policy recognizes importance of Loss and damage due to climate-related risks, they do not provide a concrete framework for addressing loss and damage. The lack of a national mechanism or fund specifically for addressing irreversible and unavoidable climate losses leaves a critical gap in the climate governance structure.

Currently there is no dedicated governing body or specific government institutional structure solely responsible for "Loss and Damage" in the Solomon Islands. Existing climate change-related responsibilities are typically handled through broader environmental and disaster management institutions. Ministry of Environment, Climate Change, Disaster Management and Meteorology

(MECDM) is the primary body responsible for climate change policy, disaster risk management supported by National Disaster Management Office (NDMO) and Climate Change Division.

The Solomon Islands has been active in international climate negotiations under the UNFCCC in proactively and strongly advocating for the establishment of a global loss and damage fund, especially through the Alliance of Small Island States (AOSIS). At COP 28 in Dubai, the Loss and Damage Fund was operationalized. The operationalization of Loss and Damage Fund unlocks financial resources to address a variety of challenges associated with the adverse effects of climate change, such as climate-related emergencies and means to address loss and damage due to both extreme weather events and slow onset events.

Despite global progress domestic institutional arrangements remain fragmented and insufficient, especially in terms of addressing non-economic loss, permanent displacement, and slow-onset events.

Examples of national and local actions for addressing economic and non-economic loss and damage due to Climate Change:

Addressing loss and damage	Action/ program/ Activity	Coverage (economic and noneconomic Loss and Damage)
In 2020, the Government launched its National Disaster Management Plan and established a National Disaster Management Office	The plan outlines a comprehensive strategy to enhance disaster risk reduction, emergency response, and post-disaster recovery. Serves as a guiding framework for coordinated action across ministries and sectors during and post disaster events. National Disaster Management Office (NDMO) assigned as central coordinating body for disaster management.	As a measure to reduce economic losses due to extreme weather events. Short- and long-term recovery and rehabilitation actions, Social and environmental protection actions, including post -disaster support.
Early warning infrastructure is the Solomon Islands Meteorological Service (SIMS)	Vital role in monitoring natural hazards and disseminating lifesaving information to vulnerable communities. National Weather Forecasting Office was opened, which will enable SIMS to deliver early warning services	Enable timely actions and evacuation reducing impacts of both economic and non-economic losses (loss of life, biodiversity)
The Integrated Disaster Risk Management project	Project aimed to decentralize and strengthen disaster risk reduction at provincial and community levels. A key success was in Temotu, where dedicated staff significantly enhanced local capacity to implement the national disaster management plan.	Effective measure for addressing economic losses due to extreme weather events such as Floods, Cyclones etc. Helps post disaster Rebuilding damaged infrastructure and rehabilitation.

	This capacity was effectively mobilized during a series of tropical cyclones in late 2023 and early 2024, enabling coordinated response and recovery efforts for affected communities.	
Choiseul Provincial Emergency Operations Centre	Coordinate emergency response and recovery efforts. Equipped with advanced communications and information management systems, the Centre serves as a critical hub for disaster operations.	Actions for addressing both economic and non-economic loss and damage Reparations to help ensure future well-being following loss Assessment of loss and repair of damage needed;
Established the National Disaster Recovery Framework.	National Disaster Recovery Framework, outlines clear roles and responsibilities for various government agencies, as well as detailed procedures for assessing damage, mobilizing resources, and implementing recovery programs following a natural disaster. Importantly, the disaster recovery process is designed to be inclusive and participatory, with local communities playing a central role in decision-making and implementation. Strengthen the coordination capacities of provincial disaster committees (PDCs) and provincial disaster operations centers (P-DOCs)	This measure addresses economic and non-economic loss and damage caused due to climate related disasters.

As climate change continues to pose significant risks, effective government policies and proactive actions are essential for safeguarding the environment, economy, and cultural heritage. The lack of external funding and ambition in the Nationally Determined Contributions by major emitters and those with historical responsibility will increase L&D in Solomon Islands.

Case studies highlighting extent of Loss caused due to climate induced extreme events and natural Hazards

Flash Flood, April 2014

Heavy rain brought by the tropical depression which subsequently upgraded to Tropical Cyclone Ita in early April 2014 caused some of the worst flash flooding in the history of the Solomon Islands. The rains caused river systems to overflow, sending torrents of water through the capital Honiara and villages across Guadalcanal Province. Homes and infrastructure were washed away, including one of only two bridges linking the east and west of Honiara. At least 22 fatalities and over 50,000 affected – almost 10 % of the country's total population. Honiara and the rest of Guadalcanal were declared disaster areas on 4 April. "The floods were not just the worst I have seen in my 14 years with the National Disaster Management Office, but in my whole life," said Loti Yates, former Director of the NDMO. James, from Koa Valley, is living in the Mbokonavera School in Honiara with his wife and two children, and over 70 members of his community. The family lost everything in the floods, except the clothes they wore when they fled their home. When asked if he wants to rebuild in the same place next to the Mataniko River, he is adamant it is not safe to return. "There is no need to go back because too many people died," he says. "It is too dangerous for us to live there".

Sea Level Rise

A coastal dynamic study from the Western Province using time series aerial and satellite imagery from 1947 to 2014 of 33 islands, along with historical insight from local knowledge carried out by a group of scientists from Australia have identified five vegetated reef islands present in 1947, ranging in size from 1 to 5 hectares, had completely disappeared by 2014. Another six islands had shrunk by 20 to 62 per cent in the same period, confirming anecdotal reports of people living in the area. The most populated of these, Nuatabu Island, is home to 25 families, who have witnessed 11 houses washed into the sea since 2011.

Tropical Cyclone (TC) Freda 2010

Solomon Islands region is regarded as a cyclogenesis area where the cyclone period occurs from November to April coinciding with the wet season. However, a few cyclones may occur outside of the season including some of the devastating ones such as Tropical Cyclone Namu. In late 2012, the country experienced impacts from Tropical Cyclone Freda. The Cyclone developed on the northern part of Santa Cruz Islands, Temotu Province and intensified as it tracked southwest past Makira Ulawa Province and Rennell Bellona Province. The cyclone was fully developed as category 1 between the two above named Provinces and slowly travelled further south with speed of 6-7knots. The system developed into a category 4 as it passed the Solomon Islands territory.

Table 9: Other disaster events between 2009 to 2019 and losses caused

Year	Type of Disaster/ Name	Loss / Scale Impacts
2009	Flood	60,000 affected; relief cost SBD11.5m.
2010	Flood	More than 60,000 people were affected; relief cost more than USD183,000.
2010	Cyclone Ului	Tropical Cyclone Ului intensified into a Category 4 cyclone. It affected six provinces (Makira, Rennell /Bellona, Isabel, Malaita, Guadalcanal and Temotu), causing flooding and damage to food gardens and infrastructures. The total cost for assessments was more than USD20,000.

2010	Cyclone Freda	Tropical Cyclone Freda' caused severe damages to some of the key sectors such as Agriculture (food gardens, Cocoa and banana plantations, etc.), Infrastructure (bridges, roads, community water supply Including dams, communications, etc.) and Shelter (dwelling houses). The most impacted areas were Makira, and Guadalcanal Provinces and cost of about USD400,000 for relief supplies.
2014	Flash Flood	Three days of heavy rain caused Severe flash floods in early April 2014 more than 100, 000 people were affected in Honiara and Guadalcanal,10,000 people displaced, 22 were killed and it caused major damages to infrastructure, shelter, Education, Health and Agriculture. The total economic damages and losses were estimate at USD108,000,000.
2015	Cyclone Pam	Tropical Cyclone Pam caused severe damage in Temotu Malaita and Isabel province, the worst affected province is Temotu where damages to their livelihood, water & sanitation, the estimated affected people is about 30,000
2015	Cyclone Raquel	Tropical cyclone Raquel cause damages to the Island of Western, Choiseul, Isabel, and Malaita. 1,047 Communities Affected, Total Population affected 126,187 and Total Household affected was 24,329, and relief cost of more than USD600,000.
2016	Drought (El Nino)	El Nino caused many impacts to the island of Renell & Bellona, Temotu and Makira/Ulawa province. The sectors affected were Agriculture, Education and water supply then it cost approximately USD400,000 in relief supplies.
2017	Cyclone Dona Cat. 3	Tropical cyclone Dona caused minimal damages to the Island of Temotu, 10,000 people affected Tikopia Temotu province. Sectors affected Health, Education, Fisheries, Shelter, Agriculture and RWASH. Economic lost is estimated to be approximately USD400,000.
2018	Cyclone Liua	Tropical cyclone Liua caused minimal damages to the Food gardens, water systems and critical infrastructures through flooding and landslides.
2018	Tropical Depression	The tropical depression caused minimal damages to the provinces in Solomon Islands.
2019	Tropical Storms	Three storm systems in two weeks had inundated much of the country with heavy rain that caused flooding, landslides, and the destruction of homes and food crops for up to 22,000 people.

Cooperation, good practices, experience and lessons learned

Case studies

Enhancing adaptive capacity through Community Food Security Initiative

Starting in 2019, a Community Based Organization affiliated with the Kastom Gaden Association (umbrella body for organic farmers) began an initiative to assist communities in Rennel build a local sustainable farming system with fixed farm sites and to support preservation of seedlings and learning. There are 4 farm sites, with the Ngonona Farm site fully operational. Vegetables and root crops planted at Nongona Farm site include cabbage, tomatoes, eggplant, pepper, sweet corn, kumara and taro. Farm harvests and yields are high, and when harvested, the produce is shared with the community, with some proportion sold. This initiative mainly serves to provide food security in the community and sustainable livelihood, especially in a remote island where alternative supply is limited.

Figure 12: Nongona Farm site (VNR,2024)

Learnings from Drought prone Bellona Island

Bellona, a small, isolated island southern part of Solomon Islands, has been experienced droughts many times in the past. The latest occurred in the last quarter of 2015 which peaked between the months of August to December when the rainfall was at its lowest. Bellona (pop. 1292) is a low, tiny island with an area of about 17.5 km^2 located some 16 nautical miles NW of Tingoa Provincial Headquarter in Rennell Island.

The island is primarily characterized by raised coral limestone or uplifted atoll. It resembles the shape of a canoe with its widest breadth of approximately 2.5 km and a length of 10km. The 2015 drought has caused acute food and water shortage as early as August. Food gardens were wilted and/or have not survived because of the drought. Water wells and tanks dried up leaving the people with brackish water for drinking, washing and cooking, heavily impacting the health, education and agriculture sectors.

A needs assessment was conducted by CRISP engineers in 2015 to assess (i) short term solutions to the water shortage with the use of a desalination machine, and (ii) longer term measures that could be taken to strengthen the resilience of the 4 communities in Matangi, East Gonghau, West Gonghau and Sa'aiho. The activity involved mapping of all existing water sources, determining its physical characteristics and capacities, and collecting samples for water quality testing. It also covered the assessment of water use practices, water supply and demand under all water use scenarios.

Major findings indicate that the short-term solution of providing desalination plants may not be sustainable for small communities due to their prohibitive cost. It was also noted to be very expensive for the volume that it will deliver (5,000 L/day). The ability and cost to maintain and operate desalination systems is a common problem and the root cause of the failure of many cases. Longer term measures remain to be sustainable despite limited options, narrowed down to the traditionally practiced rainwater harvesting and the development of groundwater resources.

However, all potential ground water sources were assessed to be brackish or intruded with saltwater and therefore contaminated. Water quality testing on better yielding wells detected faecal contamination rendering the water unfit for portable uses. The high e. coli and total coliform counts identified represent gross microbiological contamination. Any options developed need to be clear on the sources and how the contamination will be avoided or managed.

Rainwater collection in Bellona can be traced back to early settlements and has been an enduring traditional means of collecting good quality water. At present it is the primary source of drinking water in 95% of households while brackish groundwater is used for washing, agriculture and other domestic uses, the latter being practically very limited, far to access and contaminated from sea water intrusion and indiscriminate discharge of wastewater and other community wastes. Bellona Drought Mitigation Project (CRISP) Rainwater harvesting systems are preferred and are proposed for providing at least 28 collection points in four wards, each servicing 218 households zoned to clusters within a 200m radius from collection points. The system will supplement existing household level rainwater harvesting systems, an inventory and capacity of which has been completed.

Demand analysis and preliminary design have been calculated in which prefabricated rainwater roof units are proposed that can be quickly assembled on site. Because the purpose of the scheme is to mitigate the impact of droughts, water demand management will be critical when operating the systems.

Given that the proposed scheme under the CRISP is for water points to be community managed, the need to improve the community's perception towards project ownership is compulsory and demonstrated by a sound governance system of a water regime aimed at mitigating the impacts of drought. Water management committees are to fill the gap in managing, operating, and maintaining each rainwater harvesting system. This includes developing criteria and rules of when water can be used or conserved, it purposes, control, and distribution, that the committees can apply and enforce to avoid drought impacts. For the geographical condition of Bellona, water points will be divided into population-based zones represented by a zone leader tasked to implement and enforce water use policies set by the Water Committee themselves. The committee emanates from the ward level and is headed by a Chairperson, supported by a Vice

Chairperson, a secretary and zonal leaders tasked to administer maintenance upkeep and enforcement of water conservation policies within their zones.

Increasing disaster preparedness of Solomon Islands Meteorological Service

At the forefront of these efforts to boost the capacity and capabilities of our national and local early warning infrastructure is the Solomon Islands Meteorological Service (SIMS). SIMS plays a vital role in monitoring natural hazards and disseminating lifesaving information to vulnerable communities. Building on the success of past initiatives to equip SIMS with state-of-the-art hydrometeorological equipment and to conduct community-based early warning trainings, the Government has taken the next step in strengthening this critical institution. In December 2023, a newly constructed National Weather Forecasting Office was opened, which will enable SIMS to deliver early warning services more efficiently and effectively to a wide range of stakeholders across the country

Sirebe Tribe Carbon Trading

One of the success stories in Choiseul Province aligned to the NDS Objective 4: Resilient and environmentally sustainable development with effective disaster risk management, response and recovery, MTS 11: Manage the environment in a sustainable resilient way and contribute to climate change mitigation is the Sirebe Tribal Association which operates as the Sirebe Business Company under the Babatana Rainforest Conservation Project. The Tribal Association became the first conservation site in the country to receive carbon credit from carbon trading in September 2022 and has since been receiving carbon credit on a quarterly basis. It took more than ten years to set up the conservation area, register the land, and partner with institutions. The Tribal Association receives an amount of over $300,000 in quarterly payments for carbon credit, with an estimated amount of around $1.2 million per year. The project helps fund the school fees for children from kindergarten to tertiary level; water supplies and sanitation; building of permanent houses; and livelihood projects, such as fishing, mechanical and metal workshops. A certain percentage gained from carbon credit is dedicated to women empowerment initiatives. The project is sustainable and has already enabled access to education, improved infrastructure access to clean water, better sanitation, and income generating activities.

Figure 13: Sirebe Tribal Association, Solomon Islands

References

Solomon Islands National Statistics Office. (2023, September). *Solomon Islands 2019 Population and Housing Census: National Report (Vol. 1)*. https://solomons.gov.sb/wp-content/uploads/2023/09/Solomon-Islands-2019-Population-and-Housing-Census_National-Report-Vol-1.pdf

World Bank. (2021). *Solomon Islands*. Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15822-WB_Solomon%20Islands%20Country%20Profile-WEB.pdf

EM-DAT. (2023) Disaster Risk Reduction in the Solomon Islands Status Report. https://www.undrr.org/media/86899/download?startDownload=20250416

CSIRO; SPREP. Current and future climate for Solomon Islands: enhanced 'NextGen' projections technical report. Melbourne, Australia: CSIRO; 2021. csiro:EP2021-2160. https://doi.org/10.25919/nge2-sr30

NCCP. (2023). Solomon Islands National Climate Change Policy 2023-2032. MECDM. https://solomons.gov.sb/solomon-islands-national-climate-change-policy-nccp-2023-2032-and-long-term-low-emission-development-strategy-lt-leds/

Solomon Islands Disaster Management Reference Handbook. CFE-DM. (2023).(CFE-DM, Center for Excellence in Disaster Management and Humanitarian Assistance) https://reliefweb.int/report/solomon-islands/solomon-islands-disaster-management-reference-handbook-october-2023

MECDM. (n.d.). Retrieved from Ministry of Environment Climate Change Disaster Management and Meteorology: https://solomons.gov.sb/ministry-of-environment-climate-change-disaster-management-and-meteorology/

World Health Organization. (2019). Climate and health country profile 2019: Solomon Islands. https://www.who.int/publications/i/item/WHO-CED-PHE-EPE-19.3.1

PCCFAF. (2017). Solomon Islands Climate Change Disaster Risk Finance Assessment. https://ccprojects.gsd.spc.int/wp-content/uploads/2018/05/Executive-summary_Solomon-Islands-Climate-Change-and-Disaster-Risk-Finance-Assessment_Sep-2017.pdf

Islands National Adaptation Programme of Action (NAPA) (2008). https://www.adaptation-undp.org/resources/assessments-and-background-documents/solomon-islands-national-adaptation-programme-action

UNDRR. (2023). Disaster Risk Reduction in the Solomon Islands: Status Report. United Nations Office for Disaster Risk Reduction. https://www.undrr.org/media/86899/download?startDownload=20250416

National Development Strategy NDS 2016-2035. https://solomons.gov.sb/wp-content/uploads/2020/02/National-Development-Strategy-2016.pdf

CSIRO; SPREP. Current and future climate for Solomon Islands: enhanced 'NextGen' projections technical report. Melbourne, Australia: CSIRO; 2021. csiro:EP2021-2160. https://doi.org/10.25919/nge2-sr30

CIP 2023-2024. Solomon Island Country Implementation Plan 2023-2024. https://pacific.un.org/en/254270-solomon-islands-country-implementation-plan-2023-2024

Strengthening Resilience Against Disaster and Climate Change Related Fragility in Solomon Islands, Solomon Islands Broadcasting Corporation (SIBC). (2024). Retrieved from https://www.sibconline.com.sb/iom-provides-solomon-islands-with-equipment-to-support-community-vulnerability-assessments/

Update of the ex-ante assessment of potential impacts of the graduation of Solomon Islands from the least developed country category, UN, DESA. (2024). https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/IA-Solomon-Islands-2024.pdf

Solomon Islands - Public Expenditure Review : Fiscal Reform and the Path to Debt Sustainability World Bank Group WBG. (2022).
http://documents.worldbank.org/curated/en/099045011022232825

GFDRR. (2018) Building Community resilience in the Solomon Islands.
https://www.gfdrr.org/sites/default/files/publication/FINAL%20-%20Results%20in%20Resilience%20%20Building%20Community%20Resilience%20in%20the%20Solomon%20Islands%20-%207.9.18.pdf

VI. Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

National circumstances, institutional arrangements and country-driven strategies

In 2022, the Government of Solomon Islands developed a climate finance roadmap and established a National Climate Finance Steering Committee and secretariat. The committee is co-chaired between the Permanent Secretaries of MECDM and MoFT. The Secretariat is established in MECDM and MoFT. The National Climate Finance Steering Committee's role includes advising and coordinating with major multilateral and bilateral climate and environment funds, whose resources are needed to support the actions to achieve NDC targets of Solomon Islands.

Financing Solomon Islands response to climate change includes both mobilising more funding from international sources as well as manage and accounting the existing funding in an efficient and transparent manner. The 2021 Nationally Determined Contributions (NDCs) also included a range of measures to provide training and establish systems to meet donor requirements.

The Solomon Islands Roadmap for Improving Access to Climate Finance and Public Spending (2022) developed an action plan for a Climate Finance Resilience Unit within the MoFT. Actions were framed around three pillars, with an eventual outcome of establishing the CFRU on a sustainable basis from recurring government funds. The three pillars were:

- Access to finance
- Improving resource management
- Transparency and accounting.

The Government of the Solomon Islands (GSI) and the Regional Pacific NDC Hub through the Global Green Growth Institute (GGGI) have also developed the Nationally Determined Contribution (NDC) Investment Plan for the Solomon Islands.

This NDC Investment Plan, which includes the Project Pipeline, aims to provide essential information on opportunities for GHG mitigation and climate change adaptation and their potential means for financing in the renewable energy, land transport, forestry, and waste & manure management sectors. This information is directed towards the GSI, the private sector and State-Owned Enterprises (SOEs) in the Solomon Islands and international partners for development and finance.

Financing of all opportunities will include grants, and a few include equity, debt, and fiscal policy/regulation changes, which will need to work together as blended finance to ensure the transition level necessary to reach the mitigation potential highlighted for each opportunity in this NDC Investment Plan. The table below indicates the financial instrument types needed to implement the primary mitigation opportunities and the potential sources for financing these financial instruments.

Table 21: Available Financial instrument types for funding support

Financial Instrument Types	Potential Sources of Finance
Private Equity from Households	Households
Private Equity from Businesses	Companies, Tribal Councils, Cooperative Societies, SOEs
Grants for Capacity Building and Technical Assistance	GEF, GCF, AU-DFAT, NZ-MFAT, CTCN, ADB, FAO, WB/IFC, JICA, CIDCA, EEAS, EIB, UNDP, UNEP, UNIDO, GIZ, JICA, UK-FCDO, GGGI, NDC-Hub, UNEP, IFAD
Non-Government Grants for Finance	GCF, GEF, AU-DFAT, NZ-MFAT, WB/IFC, EIB, CIDCA, EEAS, JICA, IFAD
Guarantees for Credit	ADB, WB/IFC, IFC, EIB, GCF, IFAD
Guarantees for Export	Supplier Countries
Concessional Loans	ADB, WB, IFC, EIB, GCF, JICA, IFAD
Commercial Loans**	BSP, POB, AN, BRED, DBIS
Retail Loans**	BSP, POB, AN, BRED, DBIS
State Budget & SOEs	MFT & SOEs
Taxation: import duties & excise, corporate, personal	MFT
Insurance: Loss/Damage	Commercial

VII. Information on financial support needed by developing country Parties under Article 9 of the Paris Agreement

The Solomon Islands Revised NDC, 2021 clearly states that the country's ambitious targets are based on the premise that, they receive timely access to international climate change financing, capacity building and technology resources.

Information on financial support needed

Adaptation

The total cost for adaptation is estimated at $126,6560,000. The cost for revising and implementing the national adaptation plan (NAP) and NAPA will have changed considerably upward and therefore will require further evaluation and costing. Other priorities identified through the national communication process would cost an additional USD109,400,000. It is expected that a considerable portion of the necessary financing will be provided in the forms of grants from the Green Climate Fund, Global Environment Facility (GEF), Special Climate Change Fund, Least Developed Countries Fund, Adaptation Fund, and other multilateral and bi-lateral climate change programs.

Mitigation

The scope of the 2021 NDC focuses mainly on energy sector and forestry. The energy sector actions are renewable energy generation capacity expansion, with a list of unconditional and conditional projects, and energy efficiency through appliance regulation. The forestry sector actions include a forest inventory, introducing a sustainable logging policy, protecting forests above 400 m, increasing the proportion of terrestrial, coastal, and marine ecosystems with a protected area status. The 2021 NDC does not include mitigation actions in the waste sector (solid waste and manure management) or specific mitigation targets for land transport or forest carbon sequestration. However, it does indicate policy initiatives to take action, quantify forest carbon sequestration, and protect forests. Therefore, the results of this NDC Investment Plan are expected to contribute to setting quantitative targets for the Solomon Islands' second NDC.

The fourteen mitigation and adaptation opportunities presented in this NDC Investment Plan consist of five opportunities within renewable energy, four within land transport, three within forestry, and two within waste (solid waste and manure management). The consolidated temporal financing pathway of opportunities leads to an estimated need for USD 242.5M in total investment in the sectors. This includes USD 17.7M in development, capacity building and technical assistance needs, and USD 224.7 in capital investments.

Table 2: Mitigation and Adaptation opportunities and their estimated cost

Mitigation & Adaptation Opportunities	Total Development & Investment Costs* (US$M)	Annual Mitigation in 2030 ($ktCO_2/yr$)	Annual Mitigation in 2035 ($ktCO_2/yr$)
R1 - Fiu River Hydro Power Station	28.5	0	8.1
R2 - Komarindi River Hydro Power Station	54.77	0	31.4
R3 - Mase River Hydro Power Station	40.68	0	17.5
R4 - Solar Mini-Grids for Public Schools and Institutions	11.13	1.3	1.3
R5 - Solar Micro-Grids for Tourism Sites	12.78	2.1	2.1
Totals for Renewable Energy	147.87	3.4	60.5
T1 - Age Limits for Vehicles**	36.62	6.7	12.2
T2 - Resilient Roads Improvement Programme	5.41	0	0
T3 - E-mobility for buses in the Honiara area	37.49	1.7	5
T4 - Local alternative/Biofuel for ICE vehicles	2.76	0.1	0.1
Totals for Land Transport	82.28	8.5	17.3
F1 - Promotion of Community Forestry for Livelihoods	6	60	67.5
F2 - Eco-system Based Restoration of Degraded Forest Land Area	2.89	18	52.5
F3 - Increasing the Growth of Mangrove Forests	2.73	43.2	80
Totals for Forestry	11.63	121.2	200
W1 - Waste Management in Lala and Buala Areas	2.95	0.2	0.5
W2 - Biogas Production in Rural Communities and Farms	3.13	2.1	2.1
Totals for Waste	6.09	2.3	2.6
Primary Totals	247.87	135.4	280.6
* Includes the capacity building & technology assistance and investment (CAPEX) needs			

However, the Government cannot support all the transitional changes needed to ensure low-carbon actions in Renewable Energy, Forestry, Land Transport and Waste. The estimated USD 242.5M in investment needed for development and capital to implement the opportunities in the NDC Investment Plan is equivalent to 15% of the Solomon Islands' Real GDP in 2022,[22] and 49% of the Government state budget for 2023.

Existing finance limitations are mainly due to the scale of finance needed for the financial instruments and the complexity of this (including blended finance). Additional capacity building and technical assistance will be required to prepare individual financial instruments for each opportunity and scale them to the level needed to support significant mitigation and adaptation outcomes in the sectors.

[22] Solomon Islands National Statistics Office (2024). https://statistics.gov.sb/government-finance

VIII. Information on financial support received by developing country Parties under Article 9 of the Paris Agreement

Information on financial support received

According to the Roadmap to improve access to climate finance 2022, Solomon Island Government has received USD 86 Million from the Green Climate Fund (GCF). In comparison, other countries in the region have a more diverse portfolio with investments in multiple sectors that supports the objectives of balanced development interventions. Similarly, SIG has received USD 7.7 Million from the Adaptation Fund.

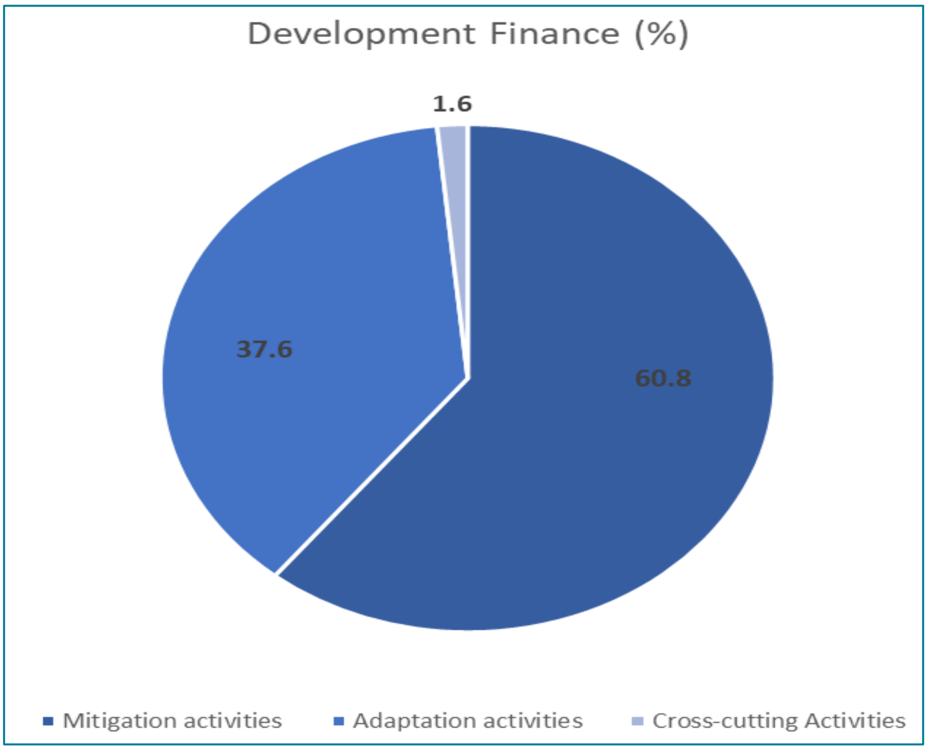


Figure 1: Thematic focus of Development Finance received by Solomon Islands

The Stockholm Environment Institute tool development finance targeted towards climate change actions including both adaptation and mitigation. The Development finance during 2002-2021, for projects addressing climate change (both mitigation and adaptation) in Solomon Islands totalled USD USD 340 Million. Of the total, USD 207million (60.8%) is targeted towards mitigation activities, USD128 M (37.6%) was targeted at adaptation activities, and USD 5.59mn (1.6%) targeted for cross-cutting projects that involve mitigation and adaptation simultaneously. The disbursement ratio for development finance to Solomon Islands targeting Climate Change over this period was 33%. By comparison, the disbursement ratio for all development finance worldwide over the same period was 83.2%. Low disbursement ratios could indicate that there are challenges implementing projects or that funding was subsequently re-directed after approval.

The current portfolio for Solomon Islands is highly concentrated with one hydropower project being managed by the World Bank. As shown in figure below, the development finance to Solomon Islands targeting Climate Change as provided to different sectors, as shown in the figure below. The largest commitments were USD 150 million to Energy, USD 44.7 million to Water Supply & Sanitation and USD 37.2 million to Transport & Storage.

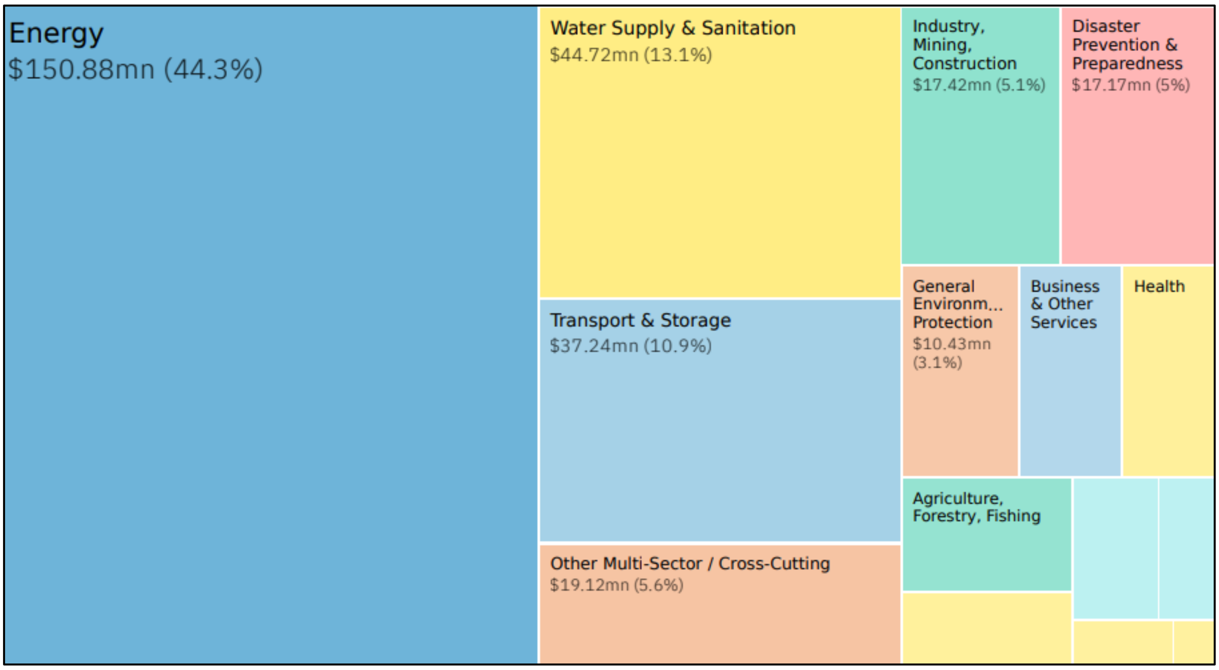


Figure 32: Total Climate finance by Sectors targeted[23]

According to the Roadmap for Improving Access to Climate Finance and Public Spending 2022 – 2027, readiness portfolio of Solomon Islands is also limited with only 1 readiness activity with USD 0.3 million disbursed (until Aug 2022) as against Tonga that has 9 with USD 2.5 million disbursement, Vanuatu 6 with USD 1.6 million and PNG 4 with USD 3.1 million disbursed. Funds mobilized by Solomon Islands Government from Green Climate Fund (GCF) account to only 2% of the total per capita financing in comparison to other countries in the region.

[23] Aid Atlas. https://aid-atlas.org ,2024

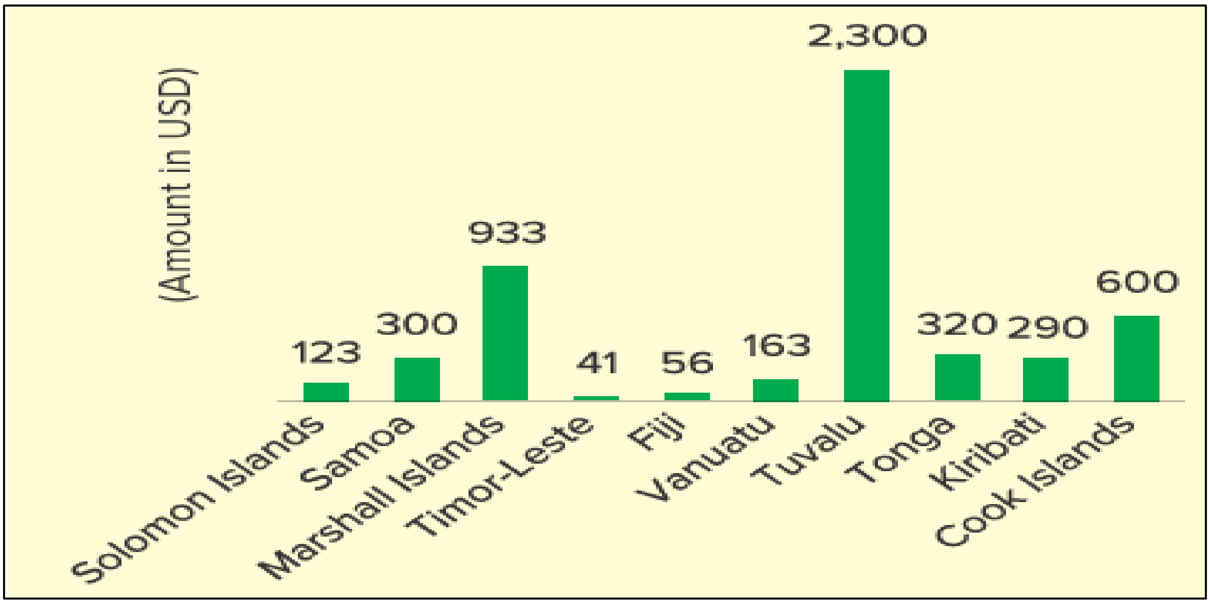


Figure 3: Per Capita GCF Financing as per the Green Climate Fund Dashboard[24]

The following table 3 highlights funding details of climate change projects in Solomon Islands, with key information on the received funding, adaptation, mitigation and cross- cutting actions, and the involved donors and national entities.

Table 33: funding details of climate change projects in Solomon Islands

Climate change project type by funding source and funding channels	
Funding Source	USD (Million)
Mitigation	
Bilateral	
Australia	26.7
Greece	0.03
Italy	0.20
Japan	19.92
Korea	32.45
New Zealand	2.86
United Arab Emirates	4.2
USA	0.6
Multilateral	
Asian Development Bank	27.03
Climate Investment Funds	13.7

24 UNDP-Solomon-Is-Roadmap-for-Improving-Access-to-Climate-Finance-and-Public-Spending-2022-2027

Global Environment Facility	16.86
International Development Association	61.99
Other	
EU Institutions (excl. EIB)	0.73
Mitigation Sector Total	207.29
Adaptation	
Bilateral	
Australia	28.16
France	0.02
Japan	6.54
Korea	1.56
New Zealand	17.05
Sweden	0.16
United Kingdom	0.02
USA	0.22
Multilateral	
Adaptation Fund	10.3
Asian Development Bank	20.22
Global Environment Facility	24.96
International Development Association	40.25
Other	
EU Institutions (excl. EIB)	3.62
Food and Agriculture Organisation	0.07
Margaret A. Cargill Foundation	0.4
Adaptation Sector Total	153.55
Cross-cutting	
Bilateral	
Australia	1.1
Ireland	0.001
Italy	0.6
Japan	3.6
Korea	0.16

Sweden	0.02
Multilateral	
Asian Development Bank	0.28
Global Environment Facility	0.009
Other	
EU Institutions (excl. EIB)	0.21
Cross-Cutting Sector Total	5.98
Grand Total	366.83

The above figures indicate that there are several sources of external climate funds available that the Solomon Islands could access for addressing issues relating to climate change. However, like other countries in the region, there is a need to enhance capacity to access these funds so the country may benefit from these financial resources.

IX. Information on support needed for technology development and transfer provided under Article 10

Information to be reported on technology development and transfer support needed

The Technology Needs Assessment (TNA) was established under the United Nations Framework Convention on Climate Change (UNFCCC), with the purpose to scale up investment in technology transfer thus empowering developing countries to address their requirements for environmentally sound technologies (EST) that are most relevant for meeting the country's climate change adaptation and mitigations targets.

The Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), Solomon Islands participated in the TNA Project in partnership with the United Nations Environment Program (UNEP) Copenhagen Climate Centre and the University of the South Pacific (USP) with funding support from the Global Environment Facility (GEF).

The technology needs assessment was a nationally driven, gender inclusive process involving relevant stakeholders. The initial consultation with stakeholders and reviews of NDC 2021, National Development Strategy, National Climate Change Policy and National Adaptation Programme of Action resulted in the prioritization for mitigation and adaptation sectors. The two sectors prioritized in mitigation technology were transportation and forestry; and two prioritized sectors in adaptation were coastal erosion and relocation.

The final selection of the technologies was confirmed based on the results of Multi-Criteria Analysis (MCA), Sensitivity Test Analysis, discussion with working groups and validation workshop.

Technology Prioritisation for Mitigation

Transportation:

- Sustainable Road (including Drainage & landscaping)
- Electric Outboard Motor

Forestry:

- Multi-Purpose National Forest Inventory
- Establish a network of terrestrial protected areas

Technology Prioritisation for Adaptation

Coastal erosion management:

- Seawall Nature based
- Integrated coastal zone management

Climate Displacement/ Relocation:

- Climate Change relocation policy
- Permanent relocation

X. Information on support received for technology development and transfer provided under Article 10

Information to be reported on technology development and transfer support received

Technology support and capacity building is critical to achieving high climate ambition. As a result, Solomon Islands has been consistent in mobilizing financial resources and technical assistance from various sources to help offset the additional cost that the economy has in combating climate change example, Solomon Islands has received technical assistance for projects such as:

- Renewable Energy and Energy Efficiency: Through support from the Green Climate Fund and the GEF, the Solomon Islands has expanded the use of Renewable energy. The Tina River project is the largest renewable energy project under development in Solomon Islands. The size of the hydropower system is 15 MW. The country has launched several solar microgrid projects to bring reliable, renewable electricity to off-grid communities. These systems help reduce dependence on imported fossil fuels and improve energy access in remote regions. Other projects such as National Electric Mobility Policy and Market Readiness Framework for the Solomon Islands, Policy Roadmap for e-Mobility in Solomon Islands, e-Bus Market feasibility in city of Honiara have also received support of implementation.
- Climate Information and Early Warning Systems: The Solomon Islands has developed and implemented early warning systems for climate-related disasters such as cyclones and flooding. International partnerships, including with the Pacific Islands Forum, have facilitated the development of climate data platforms and satellite technologies to improve disaster preparedness and response.
- Coastal Protection Technologies: The Solomon Islands has been active in adopting nature-based solutions for coastal protection. Through technical support from international partners, the country has implemented mangrove restoration and coral reef protection programs to mitigate the impacts of rising sea levels and coastal erosion.
- Climate-Resilient Agriculture: With support from the Climate Technology Centre and Network (CTCN) and other international agencies, the Solomon Islands has been working to adopt climate-resilient agricultural practices. These include the introduction of drought-resistant crop varieties, sustainable land management techniques, and the use of climate-smart irrigation systems to help farmers adapt to changing weather patterns.

XI. Information on capacity-building support needed by developing country Parties under Article 11 of the Paris Agreement

Information to be reported on capacity-building support needed

International support is crucial in strengthening institutional frameworks, improving data and research, enhancing public awareness, developing human resources, mobilizing financial resources, and building resilience to disasters. By addressing these capacity gaps, the Solomon Islands can better protect its vulnerable communities and ecosystems, while contributing to global climate action efforts.

The Government of Solomon Island is committed to addressing the National Adaptation Programme of Action (NAPA) priority sectors and implement the range of projects and actions as urgent adaptation needs. The country identified 15 actions that need capacity building support in the NDC 2021. Few of the key capacity building support actions are as following:

- Review and revise the NAPA and MECDM Strategic Plan and develop a National Adaptation Plan (NAP).
- Strengthen the capacity and partnerships of national and provincial government agencies, national institutions, NGOs, religious organizations and local communities to integrate indigenous local knowledge in vulnerability and adaptation (V&A) and disaster risk reduction (DRR) assessments for different sectors and geographic areas.
- Provide support to ministries, provincial governments and civil society organizations, including faith-based and private sector organisations, to review and revise their corporate plans, sector programs and strategies to include measures to assess vulnerability of sectors and identify and implement adaptation and disaster risk reduction strategies and actions
- Build capacity, plan and implement ecosystem-based vulnerability assessments and adaptation programs and actions including, inter-alia, implementation of the protected areas legislation and regulations, low-impact logging strategies, marine ecosystem management.
- Strengthen capacity of Solomon Islands Meteorological Services and National Disaster Management Office to provide appropriate field instrumentation and early warning systems with special focus on regions in the country more vulnerable to extreme events

XII. Information on capacity-building support received by developing country Parties under Article 11 of the Paris Agreement

Information to be reported on capacity-building support received

Solomon Islands has received training and capacity building support for the preparation and compiling of National reporting requirements such as the Third National Communication and First Binneal Update Report from International consultants as individual projects. Solomon Island Government has received several other training and capacity building workshops under Bilateral, Multilateral and Regional programs and projects to meet its obligation under the United Nations Framework Convention on Climate Change (UNFCCC).

Some of the projects through which Solomon Islands Government received capacity-building support have been mentioned below:

Adaptation

The Community Resilience to Climate and Disaster Risk Project for Solomon Islands (CRISP) was developed to increase the capacity of selected rural communities to manage natural hazards and climate change risks. One of the objectives of the project was, integration of climate change adaptation (CCA) and disaster risk reduction (DRR) in government policies and operations objective is to support policy development, capacity building, and institutional strengthening aimed at integrating governance and operational processes for CCA and DRR. Sub-components of the project supported the government in: (a) development of a national integrated CCA and a disaster risk management (DRM) framework; and (b) strengthening capacity for mainstreaming CCA and DRM in sector planning and investments. Similarly, the Japanese Technical Cooperation Project for Promotion of Regional Initiative on Solid Waste Management in the Pacific Island Countries (J-PRISM) was developed with the objective to develop/increase the capacity of the recipient countries as a whole. Through the J-PRISM project Solomon Islands Government received support in implementing priority action listed in the Regional Solid Waste Management Strategy 2010- 2015 in order to respond any issues/challenges and provide better solid waste management.

Mitigation

With support from the UN-REDD Programme, the Government of the Solomon Islands developed a national REDD+ Readiness Roadmap in the period June 2012-March 2014. The Solomon Islands REDD+ Roadmap has seven main sections outlining activities that will guide the Government towards full readiness for REDD+. Under UN-REDD Targeted Support for the development of the Solomon Islands national forest monitoring system for REDD+ under the UNFCCC. Transport Sector Development Project (TSDP) helped strengthen transport sector institutions by establishing a central project implementation unit (CPIU) to reform the government's institutional structure, implement civil works, and conduct technical and managerial capacity development.

Cross-Cutting

Coping with Climate Change in the Pacific Islands Region (CCCPIR) Project supported the Solomon Islands Government in strengthening regional advisory and management capacity to adapt to climate change and mitigate its causes. The project helped integrate climate change into government policies and existing curriculum and training programmes. The main goal of the European Union-funded Increasing Agricultural Commodity Trade (IACT) project is to strengthen the export capacity of Pacific countries in the primary industries of agriculture, forestry and aquaculture. The project employs a whole-of-supply chain approach, assisting commercial ventures and producer groups to become export-oriented, market-driven enterprises that will consistently supply overseas markets with competitive agriculture, forestry and aquaculture products.

XIII. Information on support needed and received by developing country Parties for the implementation of Article 13 of the Paris Agreement and transparency related activities, including for transparency-related capacity-building

Capacity Building Initiative for Transparency (CBIT) Project

Capacity-building Initiative for Transparency (CBIT) Project for the Solomon Islands, strengthening capacity in the agriculture and land-use as well as energy sectors in Solomon Islands for enhanced transparency in implementation and monitoring of Solomon Islands Nationally Determined Contribution (NDC) supported by GEF. This project aims to strengthen Solomon Island's technical and institutional capacity for compliance by 2025 with the Enhanced Transparency Framework (ETF) of the Paris Agreement on Climate Change to track mitigation and adaptation actions of Nationally Determined Contribution (NDC) priority sectors focusing on agriculture, land-use change, energy and waste sectors. The project has three components:

Project Component 1: Strengthening institutional arrangements and capacities to meet the Paris agreement requirements on ETF.

Outcomes of Project Component 1: Strengthened institutional arrangements to collect, archive, update and report climate transparency data through a centralized information management system. 1.2 Strengthened capacities to regularly monitor and report financing on NDC actions.

Project Component 2: Strengthening the technical capacity to develop a domestic MRV system.

Outcomes of Project Component 2: Strengthened emissions estimation of sources and sinks focusing on agriculture, land-use change, energy and wastes sectors.

Project Component 3: Strengthening capacity to monitor and report adaptation activities.

Outcomes of Project Component 3: Strengthened technical capacities for monitoring and reporting to track the progress of NDC adaptation actions.

FAO will be the GEF Implementing Agency for this project. The Ministry of Environment, Climate Change and Disaster Management and Meteorology (MECDM) will be the National Counterpart and will be responsible for the overall national coordination and execution of the field project activities. The MECDM will have the executing responsibility for the project, with FAO providing technical oversight and responsibility as GEF Agency.

In nutshell, (i) the Solomon Islands have previously received assistance in technology and capacity building however mainstreaming-much training and awareness raising is needed to mainstream climate change across stakeholder organizations, provincial governments and communities (ii)Technology transfer and capacity building needs-best practices (iii) information and improvement of human skills, especially those possessed by specialized professionals and engineers is required given that acquisition and absorption of foreign technologies, and their further development, are complex processes. (iv) education and public awareness on climate change is also required.

In nutshell, the Solomon Islands have previously received assistance in technology and capacity building. However, training and capacity building are required to access climate finance, Improving Resource Management, Transparency and Accountability, Governance, Coordination and M&E Climate, Education, communication, awareness, Project management and more.

References

Population and Housing Census: National Report (Vol. 1). https://solomons.gov.sb/wp-content/uploads/2023/09/Solomon-Islands-2019-Population-and-Housing-Census_National-Report-Vol-1.pdf

World Bank. (2021). *Solomon Islands*. Climate Change Knowledge Portal. https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/15822-WB_Solomon%20Islands%20Country%20Profile-WEB.pdf

EM-DAT. (2023) Disaster Risk Reduction in the Solomon Islands Status Report. https://www.undrr.org/media/86899/download?startDownload=20250416

CSIRO; SPREP. Current and future climate for Solomon Islands: enhanced 'NextGen' projections technical report. Melbourne, Australia: CSIRO; 2021. csiro:EP2021-2160. https://doi.org/10.25919/nge2-sr30

NCCP. (2023). Solomon Islands National Climate Change Policy 2023-2032. MECDM. https://solomons.gov.sb/solomon-islands-national-climate-change-policy-nccp-2023-2032-and-long-term-low-emission-development-strategy-lt-leds/

Solomon Islands Disaster Management Reference Handbook. CFE-DM. (2023).(CFE-DM, Center for Excellence in Disaster Management and Humanitarian Assistance) https://reliefweb.int/report/solomon-islands/solomon-islands-disaster-management-reference-handbook-october-2023

MECDM. (n.d.). Retrieved from Ministry of Environment Climate Change Disaster Management and Meteorology: https://solomons.gov.sb/ministry-of-environment-climate-change-disaster-management-and-meteorology/

World Health Organization. (2019). Climate and health country profile 2019: Solomon Islands. https://www.who.int/publications/i/item/WHO-CED-PHE-EPE-19.3.1

PCCFAF. (2017). Solomon Islands Climate Change Disaster Risk Finance Assessment. https://ccprojects.gsd.spc.int/wp-content/uploads/2018/05/Executive-summary_Solomon-Islands-Climate-Change-and-Disaster-Risk-Finance-Assessment_Sep-2017.pdf

Islands National Adaptation Programme of Action (NAPA) (2008). https://www.adaptation-undp.org/resources/assessments-and-background-documents/solomon-islands-national-adaptation-programme-action

UNDRR. (2023). Disaster Risk Reduction in the Solomon Islands: Status Report. United Nations Office for Disaster Risk Reduction. https://www.undrr.org/media/86899/download?startDownload=20250416

National Development Strategy NDS 2016-2035. https://solomons.gov.sb/wp-content/uploads/2020/02/National-Development-Strategy-2016.pdf

CSIRO; SPREP. Current and future climate for Solomon Islands: enhanced 'NextGen' projections technical report. Melbourne, Australia: CSIRO; 2021. csiro:EP2021-2160. https://doi.org/10.25919/nge2-sr30

CIP 2023-2024. Solomon Island Country Implementation Plan 2023-2024. https://pacific.un.org/en/254270-solomon-islands-country-implementation-plan-2023-2024

Strengthening Resilience Against Disaster and Climate Change Related Fragility in Solomon Islands, Solomon Islands Broadcasting Corporation (SIBC). (2024). Retrieved from https://www.sibconline.com.sb/iom-provides-solomon-islands-with-equipment-to-support-community-vulnerability-assessments/

Update of the ex-ante assessment of potential impacts of the graduation of Solomon Islands from the least developed country category, UN, DESA. (2024). https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/IA-Solomon-Islands-2024.pdf

Solomon Islands - Public Expenditure Review: Fiscal Reform and the Path to Debt Sustainability World Bank Group WBG. (2022). http://documents.worldbank.org/curated/en/099045011022232825

Information on Flexibility

Solomon Islands gives utmost priority to submitting an accurate and comprehensive information on NDC implementation and climate actions undertaken by the country. Given the limited capacity Solomon Islands has tried to submit the latest and most accurate data in its first BTR submission.

As a Least Developed Countries (LDCs) Solomon Islands faces multiple challenges in fulfilling their reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC). Flexibility provisions in the ETF are critical for ensuring that LDCs and SIDs can meet their reporting obligations under the Paris Agreement without overburdening their limited capacities.

In light of these challenges, Solomon Islands has exercised its right to flexibility provisions as part of the Enhanced Transparency Framework (ETF) under the Paris Agreement. However, abiding by the guiding principles of these modalities, procedures and guidelines (MPGs) paragraph 3c and d Solomon Islands has clearly documented flexibility provisions exercised individually in every chapter wherever applicable as well as in the CTF and CRT tables.

By leveraging these flexibility provisions, Solomon Islands can provide valuable insights into the current status climate actions while progressively improving the quality and comprehensiveness of their reports.

Improvements in reporting over time

The guiding principles of these modalities, procedures and guidelines (MPGs) paragraph 3b under Chapter 1 of the Annex to the MPGs identified the importance of facilitating improved reporting and transparency over time as a key guiding principle of the ETF. Additionally, Paragraph 7 of the MPGs specifies that this chapter should address areas of improvement by the Party itself or by the technical expert review team.

As this is the first round of submission of the BTR, Solomon Islands has not received any formal review comments under the BTR. The significance of this chapter is expected to grow in the subsequent BTRs.

The Solomon Islands is dedicated to improve its standards and capabilities towards the transparency requirements as part of the BTR submissions to the UNFCCC. As a means to improve its suceeding BTR Solomon Island will:

- Adopt a more comprehensive and systematic approach to data collection and reporting.
- The integration of digital MRV tools technologies for tracking emissions and climate impacts will enhance transparency and reliability.
- Improve coordination between government agencies and local stakeholders to ensure more detailed, accurate and timely data for reporting NDC progress in the BTR.

- Provide detailed accounts of adaptation actions, co-benefits of mitigation measures, implemented best practices / case studies and progress toward Nationally Determined Contributions (NDCs) as per the requirements of the MPGs.

With guidance and capacity building support Government of Solomon Islands aims at fostering long-term improvements in transparency reporting obligations under the United Nations Framework Convention on Climate Change (UNFCCC).