An Assessment of Vulnerable Sectors and EO Data Potential for Solomon Islands

Climate Finance Landscape Report

The Commonwealth

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Contents

Abbreviations and Acronyms

ADB	Asian Development Bank
AF	Adaptation Fund
AFD	Agence Française de Développement
CCFAH	Commonwealth Climate Finance Access Hub
CI	Conservation International
CIF	Climate Investment Funds
CO_2e	carbon dioxide equivalent
DFAT	Australian Department of Foreign Affairs and Trade
DRR	disaster risk reduction
EO	Earth Observation
EU	European Union
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Fund
GGGI	Global Green Growth Institute
GHG	greenhouse gas
GIS	geographic information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IFAD	International Fund for Agricultural Development
IRENA	International Renewable Energy Agency
IUCN	International Union for Conservation of Nature
JICA	Japan International Co-operation Agency
LDCF	Least Developed Countries Fund
LDC	least developed country
MDB	multilateral development bank
MFAT	New Zealand Ministry of Foreign Affairs and Trade
NAPA	National Adaptation Programme of Action
NBSAP	National Biodiversity Strategy and Action Plan

NDC	Nationally Determined Contribution
NDMP	National Disaster Risk Management Plan 2018
NDS	National Development Strategy 2016–2035
NGO	non-government organisation
NTF	National Transport Fund
NTFP	non-timber forest products
NWMPCS	National Waste Management and Pollution Control Strategy 2017–2026
OECD	Organisation for Economic Co-operation and Development
PRIF	Pacific Region Infrastructure Facility
PV	photovoltaic
R2R	ridge-to-reef
RE	renewable energy
REDD+	Reducing emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries
SIALSP	Solomon Islands Agriculture and Livestock Sector Policy
SIDS	small island developing state
SINEP	Solomon Islands National Energy Policy
SI NIIP	Solomon Islands National Infrastructure Investment Plan
SPC	The Pacific Community
SPREP	Pacific regional environment programme
SRS	satellite remote sensing
tCO_2e	tonnes of carbon dioxide equivalent (sometimes abbreviated as $MtCO_2e$)
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
US$	United States dollar
WB	World Bank
WHO	World Health Organization

Foreword

Pacific small island developing states (SIDS) states like Solomon Islands are disproportionately affected by climate change, due to their unique geographical and socioeconomic characteristics that increase their vulnerability. The region is already experiencing the devastating impacts of climate change, including sea-level rise, lowland and coastal erosion, increased extreme weather events, drought, loss and damage of coastal infrastructure, and insecure food production. It is therefore important that Solomon Islands and all Pacific island states take action to adapt and build resilience to the current and future impacts of climate change. It is in this regard that Pacific SIDS are leading the fight, setting ambitious mitigation and adaptation targets. To meet these priorities and targets, Pacific SIDS, including Solomon Islands, require access to adequate financial and human resources to enhance the ability of key sectors to bear the brunt of climate change.

This report gives an overview of the climate finance landscape in Solomon Islands, highlighting the funding gaps in priority sectors identified by Solomon Islands and the potential to use Earth Observation data to support access to much-needed adaptation and mitigation finance for these sectors.

Earth Observation (EO) data and information have emerged as an important tool in supporting evidence-based decision-making, particularly for climate action, providing accurate, reliable and timely information on the status of many climatic and environmental parameters. The Commonwealth Secretariat, through the International Partnership Programme (IPP) CommonSensing Project, is driving and advocating for the increased use of EO data and information to strengthen the evidence base and climate rationale of funding applications.

The IPP CommonSensing Project[1] is an innovative partnership between the governments of Fiji, Solomon Islands and Vanuatu and a consortium of international partners.[2] It aims to provide actionable satellite-based information services and data around disaster and climate risks, to inform planning, climate action and increased access to climate finance. The Commonwealth Secretariat, through its flagship programme, the Commonwealth Climate Finance Access Hub (CCFAH), is spearheading the climate finance component of the CommonSensing Project. Through CCFAH Commonwealth National Climate Finance Advisers have been deployed for Fiji, Solomon Islands and Vanuatu and are providing technical assistance to the three countries to utilise the geospatial-based CommonSensing platform for enhanced access to climate finance.

The Climate Finance Landscape Report: An assessment of vulnerable sectors and EO data potential in Solomon Islands therefore builds on the Commonwealth's body of work under the IPP CommonSensing Project to support Pacific SIDS to mobilise climate finance to convert their commitments and targets into action. By highlighting the key sectors that still require funding and by matching those against sectors with the highest potential for the application of EO data in climate finance applications, the Commonwealth Secretariat hopes to increase the use of such data and information in Solomon Islands to push forward funding in these areas.

We hope this resource makes a difference for Solomon Islands and other partners to deliver the ambitious Nationally Determined Contribution (NDC) targets and aspirations of the islands' people.

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1 The IPP CommonSensing Project is generously funded by the UK Space Agency's International Partnership Programme (IPP) and the Global Challenges Research Fund (GCRF).

2 United Nations Institute for Training and Research (UNITAR - UNOSAT), Commonwealth Secretariat, Catapult Satellite Applications, Devex, Met Office, Sensonomic, Spatial Days and the University of Portsmouth.

Executive Summary

Pacific island countries (PICs) face serious threats from climate change, particularly increasingly severe extreme weather events, sea-level rise, and impacts on agricultural production. While PICs have extremely low per capita greenhouse gas (GHG) emissions, governments from across the region have also prioritised the reduction of such emissions through their Nationally Determined Contributions (NDC), especially in relation to energy and transport sector targets.

Transitioning PICs to a low-carbon climate resilient development pathway will require a wide array of adaptation and mitigation measures, strengthened institutional frameworks and improved data collection and utilisation. Achieving these outcomes exceeds the financial capacity of most PICs, and the mobilisation of public and private sources of climate finance is therefore crucial for achieving climate change priorities, targets and commitments.

While there is a significant amount of funding available from dedicated climate funds, multilateral organisations, bilateral donors and other sources, PICs face challenges in accessing and deploying climate finance. Flows of climate finance need to be aligned with both the climate change and development goals of each country, to ensure that funding results in inclusive development outcomes and delivers strong environmental, social and economic co-benefits.

The objective of this report is to identify the climate financing gaps, opportunities and barriers for Solomon Islands and provides an overview of the baseline climate action needs, highlighting the key vulnerable sectors and the related climate finance requirements based on nationally agreed targets and ambitions.

Climate Finance Landscape Report: An assessment of vulnerable sectors and EO data potential in Solomon Islands has been published as part of the CommonSensing initiative, which is a partnership between Fiji, Solomon Islands and Vanuatu, and a consortium of international partners including the Commonwealth Secretariat, working together to support and build climate resilience and enhance decision-making through the use of satellite remote sensing technology and facilitating access to climate finance.

This report is aimed at informing the basis for future targeting of climate finance in line with the national and sectoral strategies and priorities, including the NDC. The report is structured as follows:

- **Chapter 2: Review of national plans and strategies.** This chapter provides a summary of the key national and sectoral plans and strategies, identifying any key climate change priorities, targets or required actions for Solomon Islands development.
- **Chapter 3: Climate finance overview.** This chapter summarises the approximate amount of climate finance received by Solomon Islands between 2016 and 2018 mapped against 11 sectors. This information has been obtained from relevant climate fund and development partner websites and the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD).
- **Chapter 4: Data access and utilisation.** This chapter provides an overview of space applications and geospatial technology, and the potential of the data and information for strengthening the design, implementation and monitoring of climate change projects.
- **Chapter 5: Sector assessment.** This chapter discusses the status of climate finance utilisation in each sector/thematic area. The climate finance projects are qualitatively assessed in relation to the climate change related national and sectoral plans, targets and goals. This chapter also discusses potential data utilisation and applications for enhancing climate financed projects in relation to each sector.
- **Chapter 6: Recommendations for attracting climate finance.** The final chapter puts forward a number of solutions and recommendations to strengthen access and deployment of climate finance. These recommendations are focused on institutional strengthening, capacity building and increasing technical capabilities, increasing information and data utilisation, increasing access to finances, increasing involvement in private sector activities and increasing wider stakeholder engagement.

Solomon Islands has successfully developed and adopted a number of key national and strategic plans which outline the country's progress, priorities and future activities for addressing climate change. Key plans and strategies are the Nationally Determined Contribution, National Climate Change Policy, and the National Development Strategy.

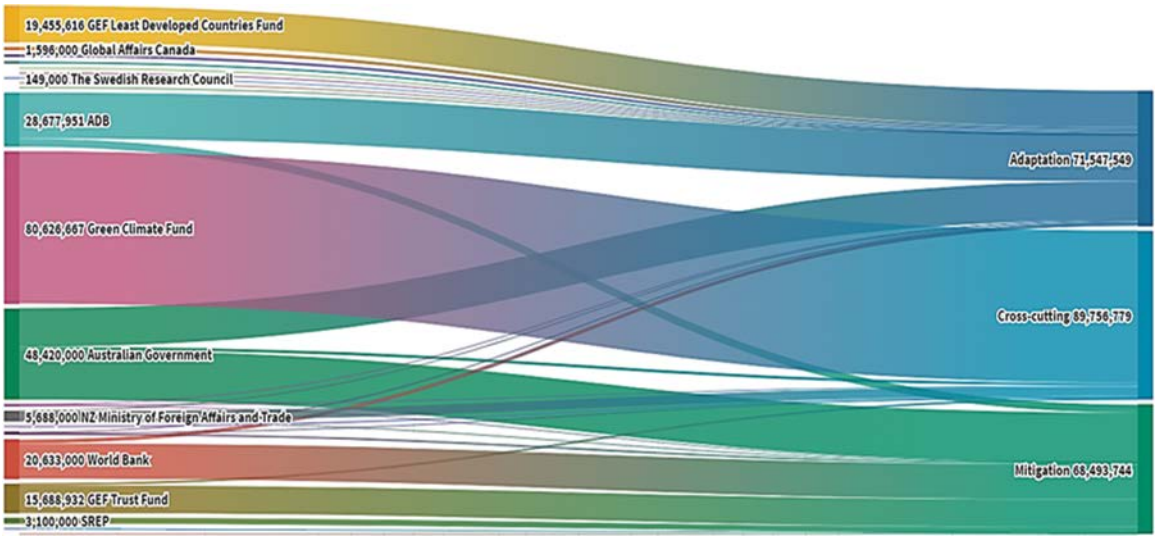
By reviewing the actions and priorities of climate-relevant plans and mapping these against the flows of climate finance received between 2016 and 2018, climate financing gaps were identified. This assessment concluded that the resilient infrastructure, waste and health sectors in Solomon Islands received the lowest amount of financial flows between 2016 and 2018. According to the analysis, approximately US$230 million of climate finance was received by Solomon Islands over 2016–2018 through approximately 98 projects (as shown in Figure 1.1).

In line with the priorities of the CommonSensing project, this report outlines the potential for satellite remote sensing (SRS) applications to help build climate resilience and enhance decision-making. This report indicates that, with current technology, the potential for adopting SRS is high across most sectors; however, it may be more difficult to utilise SRS data for climate finance projects in the waste sector and biodiversity and the natural environment thematic area (as shown in Table 1.1).

A number of barriers have also been identified that may hinder the ability of Solomon Islands to access climate finance and utilise SRS for future projects. At a high level there are steps that may be taken to overcome these barriers:

- Clearly outlining the roles and responsibilities of stakeholders, and developing processes and incentives to strengthen co-ordination and collaboration (see section 6.1).
- Strengthening capacity and capabilities of government agencies to implement climate action, including through development of a training programme and the provision of long-term embedded models of technical assistance (see section 6.2).
- Improving the access and utilisation of information and data to improve the project design, implementation and monitoring and evaluation of climate change activities. These recommendations have a strong focus on the use of SRS data (see section 6.3).
- Strengthening policies, strategies and plans – including through ensuring actions are

Figure 1.1 Summary of Solomon Islands climate finance flows between 2016 and 2018[3]



3 Diagram is author's own. The source of the data is from the various funding providers websites, and OECD-DAC. The data from OECD-DAC is available here: https://www.oecd.org/development/stats/climate-change.htm

Table 1.1 Summary of Solomon Islands sectoral financing and SRS application potential[4]

Sector/thematic area	No. of projects	Financing status	SRS data application potential	Past SRS data utilisation
Transport	5	Adaptation projects: Satisfactory progress Mitigation projects: Limited data	High	Successful utilisation for climate finance (CF) projects
Energy	11	Satisfactory progress	High	Successful utilisation for CF projects
Forests and land use	15	Satisfactory progress	High	Successful utilisation for CF projects
Waste	3	Limited progress	Low	Limited evidence of utilisation
Ecosystems and ecosystem services	17	Satisfactory progress	Medium	Limited evidence of utilisation
Livelihoods and disaster risk reduction	11	Satisfactory progress	High	Successful utilisation for CF projects
Resilient infrastructure	2	Satisfactory progress	High	Limited evidence of utilisation
Agriculture	9	Satisfactory progress	High	Successful utilisation for CF projects
Water supply and wastewater	16	Satisfactory progress	High	Successful utilisation for CF projects
Health	1	Limited progress	High	Successful utilisation for CF projects

costed, responsibilities for implementation are defined, and financing is identified for implementation (see section 6.4).

- Overcoming climate finance barriers and mobilising climate finance flows in order to meet current and future needs, particularly with increasing climate change and natural disaster risks. This will require expanded financial instruments and modalities, and strengthened capacity and co-ordination to develop funding proposals (see section 6.5).
- Strengthening private sector engagement through building awareness and knowledge of opportunities, providing support on accessing climate finance, and providing an environment to enable increased flows of private investment (see section 6.6).
- Improving stakeholder engagement to achieve climate action, which includes engaging with line ministries, provincial administrations, communities, NGOs and the private sector (see section 6.7).

The results of the assessment of climate finance by sector and findings of this report, including the financing gaps, potential sources of climate finance and status of plans and strategies, are summarised in Table 6.3 in Chapter 6.

4 *Author's own analysis.*

1. Introduction

The Climate Change Section of the Commonwealth Secretariat focuses on strengthening the resilience of Commonwealth countries to the negative impacts of climate change. It facilitates capacity development of member countries to access public and private climate funding to implement the Paris Agreement.

The Commonwealth Climate Finance Access Hub (CCFAH) was established following recommendations arising out of the Commonwealth Expert Group on Climate Change that examined how the Commonwealth can best assist its developing country members to build resilience. Launched in 2016, CCFAH provides long-term capacity development to support improved access to climate finance

Since 2017, the CCFAH has evolved to become one of the flagship programmes of the Commonwealth Secretariat and extended its technical assistance programme in ten climatically vulnerable countries in Asia, Africa and Caribbean regions, with some concrete results in terms of mobilisation of climate finance. The CCFAH is at present expanding in the Pacific region.

A further priority of the Commonwealth Secretariat in the Pacific is the CommonSensing project, which is based on a partnership between Fiji, Solomon Islands and Vanuatu, and a consortium of international partners including the Commonwealth Secretariat. The CommonSensing project is providing innovative support to build climate resilience and enhance decision-making through the use of satellite remote sensing technology and facilitating access to climate finance. The project is funded by the UK Space Agency, with United Nations Institute for Training and Research (UNITAR) as project lead and in partnership with Commonwealth Secretariat, Satellite Applications Catapult, UK Met Office, University of Portsmouth and Sensonomic.

The Commonwealth Secretariat is committed to improving the capacity of each country to access climate finance beyond the life span of the CCFAH and CommonSensing projects and building local capacity for mobilising finance to implement and accelerate climate action. Moreover, these projects will aim to provide information and evidence to support and enhance funding proposals in key and climatically vulnerable sectors.

1.1 Objectives of the report

An integral component of the CommonSensing Project is to assist countries in accessing climate finance based on information and data collected from remote sensing sources and analysing economic impacts. The objective of this report is to improve targeting of climate finance in line with national and sectoral priorities, plans and strategies, and to contribute to the design of the technical assistance provided under the CommonSensing project.

This report documents the findings which consider:

- climate change needs and priorities of Solomon Islands;
- key vulnerable sectors and the status of climate change projects;
- climate finance requirements based on Solomon Islands' nationally agreed targets and ambitions;
- assessment of data opportunities and utilisation; and
- requirements for institutional, policy and regulatory strengthening.

1.2 Country context

Solomon Islands, as a small island developing state (SIDS) and a least developed country (LDC), is highly vulnerable to the adverse effects of climate change. Solomon Islands comprises 994 islands with 4,023 kilometres of coastline, which includes mountainous islands and low-lying coral atolls. Solomon Islands is located within a tuna-rich and potentially mineral-rich maritime exclusive economic zone (EEZ) of 1.34 million square kilometres.[5]

Solomon Islands has a population of approximately 670,000 with a population density of 23 people per square kilometre.[6] The capital and largest city is Honiara, which is the only major area of economic activity and has a population estimated at 67,000. There are no other cities with a population of more

5 Government of Solomon Islands (2017), Second National Communication.

6 World Bank (no date), Solomon Islands, available at: https://data.worldbank.org/country/solomon-islands

than 10,000 in the country.[7] Around 80 per cent of the national population live in rural low-lying coastal areas.[8]

According to the 2019 World Risk Report, Solomon Islands is the fourth most at-risk country globally to disaster risks, which are likely to be further exacerbated by climate change over time.[9] Solomon Islands faces high risks from climate hazards, including tropical cyclones, heavy rainfall and sea-level rise, and associated inland and coastal flooding and landslides, higher mean temperatures, heatwaves and droughts, and increased ocean acidification.[10]

The climate of Solomon Islands is already changing and will continue to change and affect Solomon Islanders and their environment. It is projected that temperatures will continue to increase, there will be more very hot days, rainfall patterns will change, there will be more extreme rainfall days and less frequent but more intense tropical cyclones, sea level will continue to rise and ocean acidification will increase.[11]

High rainfall intensity events occur during tropical storms and often result in flooding of most river systems, although rainfall trends vary across the country and are influenced by geographic differences. Most recently, the highest recorded daily rainfall of 318mm was recorded in April 2014 causing widespread flooding and damage to property, infrastructure and loss of 23 lives in Honiara.[12]

As with other SIDS, the majority of Solomon Islands communities are located within the coastal margin and rely on the ocean for their wellbeing. Coastal low-lying and atoll islands are at risk from flooding, storm surges, sea-level rise and ocean chemistry changes that could impact coastal infrastructure, water supply, agricultural systems and fisheries.[13]

The rural population of Solomon Islands is highly dependent on subsistence agriculture for food, income and livelihoods. The agricultural sector will be affected by changing rainfall and the direct impacts of extreme weather events such as cyclones, floods and droughts.[14]

Climate change will also have impacts on the health of Solomon Islanders, including from increased rates of vector-borne diseases (such as malaria and dengue fever), water-borne diseases (such as viral and bacterial diarrhoea) and diseases related to toxic algae (such as ciguatera fish poisoning).[15]

While Solomon Islands greenhouse gas (GHG) emissions are negligible, the Government of Solomon Islands (GoSI) is committed to contributing to the global effort to reduce greenhouse gas emissions and increase the resilience of its communities to the impacts of climate change.[16]

As of 2015, GHG emissions in Solomon Islands are estimated at 20tCO_2e (carbon dioxide equivalent) per year, which represents approximately 0.01 per cent of global GHG emissions. The energy sector contributes the majority of GHG emissions for Solomon Islands including emissions from electricity generation, sea transport and land transport.[17] The total GHG emissions, however, are highly uncertain as land use, land-use change and forestry (LULUCF) emissions are not estimated. If LULUCF emissions are included in the emissions inventory, Solomon Islands could be one of the largest GHG emitters per capita in the Pacific due to rates of deforestation and land-use change.[18]

Addressing climate change in Solomon Islands could also be affected by the COVID-19 pandemic. The pandemic has resulted in severe economic impacts to Solomon Islands, including a large reduction in government revenue and gross domestic product (GDP)[19] (projected to decline by 6 per cent in 2020). This could reduce the capacity of GoSI to mobilise climate finance from both domestic and international sources. This could also be compounded by reductions in aid budgets

7 Government of Solomon Islands (2015), Nationally Determined Contribution.
8 Government of Solomon Islands (2017), Second National Communication.
9 Bündnis Entwicklung Hilft (2019), *WorldRiskReport 2019*.
10 Government of Solomon Islands (2015), Nationally Determined Contribution.
11 Government of Solomon Islands (2017), Second National Communication.
12 Ibid.
13 Ibid.
14 Ibid.
15 World Health Organization (2015), *Human health and climate change in Pacific island countries*.
16 Solomon Islands Intended Nationally Determined Contribution, 2015.
17 Ibid.
18 Government of Solomon Islands (2017), Second National Communication.
19 Asian Development Bank (no date), 'Solomon Islands and ADB', available at: https://www.adb.org/countries/solomon-islands/main

in developed countries, and downstream impacts to other providers of climate finance, such as dedicated climate funds.

The provision of technical support on achieving climate action has also been impacted by COVID-19. A number of projects funded by climate finance providers are likely to be delayed, and financing could potentially be redirected away from climate-related activities to short-term needs, such as the humanitarian and health impacts from COVID-19.

2. Review of National Plans and Strategies

In this chapter, a review of the key national plans and strategies and associated climate change priorities, commitments and targets is undertaken. The future mobilisation of climate finance should be aligned to these plans and strategies, particularly the National Development Strategy (NDS) 2016–2035 and the Nationally Determined Contribution (NDC) 2015, and the sectoral/thematic priorities and targets outlined in these frameworks are assessed in further detail in Chapter 4 of this report.

The governance arrangements, capacity and technical needs, and policy and regulatory reforms required for mobilising climate finance, achieving climate action and engaging the private sector are also outlined in national plans and strategies. These recommendations are assessed and collated in Chapter 5.

2.1 National planning frameworks, commitments and targets

2.1.1 National Development Strategy 2016–2035

The Solomon Islands NDS 2016–2035 maps out a strategic direction for the country's future development. The NDS sets out a long-term development strategy and priority development objectives to guide government activities, and the formulation of the Medium-Term Development Plan (MTDP) and the budget. The NDS presents a visionary 20-year strategy, with development targets for each sector, to guide social reform and economic advancement and facilitate sectoral reform programmes to assist in attaining the Sustainable Development Goals (SDGs).

Five key long-term NDS objectives have been identified on which development should focus:

- sustained and inclusive economic growth;
- poverty alleviated across the whole of Solomon Islands, basic needs addressed and food security improved; benefits of development more equitably distributed;
- all Solomon Islanders to have access to good healthcare and education;
- resilient and environmentally sustainable development with effective disaster risk management, response and recovery; and
- unified nation with stable and effective governance and public order.

The five objectives are to be achieved through detailed medium- and long-term strategies and priorities.

2.1.2 Nationally Determined Contribution 2015

In its NDC, Solomon Islands has committed to reduce emissions by 12 per cent below 2015 level by 2025 and 30 per cent below 2015 level by 2030 compared to a business as usual (BAU) projection. Solomon Islands can, with international assistance, contribute a further 27 per cent reduction in GHG emissions by 2025 and 45 per cent reduction in GHG emissions by 2030 compared to BAU projection.

At least US$200 million is estimated to be required to support the 'conditional' NDC targets. Therefore, improved access to climate finance remains a key priority. Actions for lowering emissions are focused on increasing hydro and solar power capacity across the country.

The second NDC for Solomon Islands is in a draft form, and has not been submitted to the United Nations Framework Convention on Climate Change (UNFCCC). In the second NDC, GoSI will prioritise achieving mitigation and adaptation measures.

2.1.3 National Climate Change Policy 2012–2017

The National Climate Change Policy (NCCP) 2012–2017 provides a national strategic framework for the country to address climate change. The NCCP recognises climate change as a sustainable development issue that brings opportunities as well as challenges. Building upon this idea, the government through this policy aims to enhance

the country's adaptive capacity while pursuing a path of low-carbon development. Based on nine guiding principles, the climate change response actions have been grouped under ten categories which include finance, technology, vulnerability and adaptation, and mitigation activities. The NCCP is being updated. The NCCP has a number of directives and strategies the government is required to implement for both adaptation and mitigation. These are summarised in Table 2.1.

Table 2.1 National Climate Change Policy directives and strategies

Thematic area	Directive and strategy
Enabling environment and institutional arrangements	Solomon Islands shall have in place an effective enabling environment and institutional arrangement to plan, implement and co-ordinate an integrated and multistakeholder participatory approach to addressing climate change.
Mainstreaming of climate change	Climate change shall be mainstreamed into all development sectors and integrated into the work of government agencies, national institutions, civil society and private sector.
Vulnerability and adaptation and disaster risk reduction	GoSI considers it urgent to develop capacity to assess risks and vulnerabilities associated with climate variability and change and to reduce climate change risks and adapt to the predicted impacts of climate change. This includes short-term disaster risk reduction measures for climate variability and extreme events, and long-term adaptation to climate change including enhancing ecosystem and social resilience, climate proofing infrastructure and relocating communities as a last resort.
Mitigation	GoSI is committed to carry out its own inventory of emissions and pursue nationally appropriate mitigation actions (NAMAs) to reduce GHG emissions through the use of renewable energy and other mitigation technologies that bring benefits to the country's economy, environment and improves the livelihoods of its people.
Research and systematic observation	GoSI shall work together with national stakeholders and development partners to ensure that there is a better understanding of climate change at all levels for the effective planning and implementation of appropriate climate change adaptation and mitigation actions.
Technology transfer	GoSI recognises the importance of technology transfer to enhance the country's capacity to carry out adaptation and mitigation actions. Technology transferred for use in Solomon Islands should be proven and adaptable, environmentally friendly, appropriate to user, culturally friendly and appropriate for management on a sustainable basis.
Education, awareness, and capacity building	GoSI shall work together with stakeholders and development partners to strengthen the capacity of national, provincial and community organisations and human resources for the effective planning and implementation of appropriate climate change adaptation, disaster risk reduction and mitigation actions.
Finance and resource mobilisation	GoSI shall ensure that technical assistance and financial resources to support climate change programmes and projects in the country are mobilised, managed and accounted for in an efficient, participatory, and transparent manner.
Partnership and co-operation	GoSI shall develop and maintain strong partnerships and work co-operatively with its national partners, stakeholders, regional and international organisations and institutions and development partners to address climate change.
Monitoring and evaluation	GoSI shall establish a mechanism to monitor the implementation of this climate change policy.

2.1.4 National Infrastructure Investment Plan 2013–2023

Solomon Islands National Infrastructure Investment Plan (SI NIIP) presents the priorities of GoSI and the strategic direction for major initiatives in economic infrastructure over the 2013–2023 period. This is the first attempt to compile in one document the development needs for the various subsectors of economic infrastructure, including energy, land, sea and air transport, water and sanitation, telecommunications, and solid waste management.

SI NIIP resulted in the prioritisation of a number of activities that closely align with the NDS and identified a number of issues and associated strategies to address issues in the energy/power subsector as summarised in Chapter 5.

2.1.5 National Disaster Risk Management Plan 2018

The National Disaster Risk Management Plan (NDMP) 2018 outlines institutional arrangements to address disaster risk management within the country. It includes both disaster management arrangements for preparing for, managing and recovering from disaster events and institutional mechanisms for addressing disaster risk reduction, including climate change adaptation.

NDMP 2018 represents a comprehensive disaster risk management policy addressing:

- disaster management preparedness for, response to and recovery from disasters; and
- disaster risk reduction for reducing the risks of hazards and the potential impacts of disaster events.

The purpose of this plan is set out below.

- Detail institutional arrangements for the overview and implementation of disaster risk management in Solomon Islands.
- Allocate roles and accountabilities for disaster risk management to agencies across sectors and levels of government including civil society and the private sector.
- Set explicit structures across levels of government, sectors and communities for preparing for, managing and recovering from disasters.
- Set mechanisms for understanding hazards and addressing disaster risk reduction, including climate change adaptation, within national, sector and provincial planning and budgeting processes.
- Provide for the promotion and development of disaster management in communities and for the addressing of hazard risk in livelihood practices, land use and development.
- Promote initiatives in disaster risk management which are gender and child specific, recognising particular roles and vulnerabilities in communities.

3. Climate Finance Overview

3.1 Summary

The following summarises the approximate amount of climate finance received by Solomon Islands between 2016 and 2018. This information has been obtained from relevant climate fund and development partner websites and the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD). Projects were categorised based on the following sectors and thematic areas:

- transport;
- energy generation and access;
- waste;
- forests and land use;
- agriculture;
- water;
- health;
- resilient infrastructure;
- livelihoods and disaster risk reduction;
- ecosystem and ecosystem services; and
- climate readiness.[20]

3.2 Methodology for determining climate finance flows

Climate finance is enshrined in the United Nations Framework Convention on Climate Change (UNFCCC), with Article 4 of the UNFCCC Convention stating that developed countries, particularly OECD member countries, should assist developing countries with financial resources to meet their climate change obligations. Further, Article 9(1) of the Paris Agreement also states that 'developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention'. These funds are managed by several multilateral and bilateral institutions.[21] The DAC OECD Rio markers were used to determine which projects should be included within the climate finance flows as a climate focused project. There are three possible categories for the Rio markers, indicating whether the Rio Convention themes are not targeted, a significant objective or a principal objective of the action.[22] Using this as a guide, projects that had either significant or principal climate objectives were included in the mapping below.

3.3 Mapping of climate finance inflows for 2016–2018

According to the analysis, approximately US$230 million of climate finance was received by Solomon Islands over 2016–18 through approximately 98 projects. Over this period, cross-cutting projects have received the greatest amount of funding at approximately US$90 million. See Figure 3.1 for a summary of climate finance inflows over this period.

The most significant amount of climate-related finance was directed towards a Green Climate Fund (GCF) project, followed by the Australian Government, the Asian Development Bank (ADB), the World Bank and the Global Environment Fund (GEF) Least Developed Countries Fund.

Based on the sectoral categorisation undertaken, of the approximately 98 projects identified between 2016 and 2018, only one project contributed to the health sector, 2 to resilient infrastructure, 3 to the waste sector and 5 to the transport sector; 17 projects had a focus on ecosystem and ecosystem services, 16 had a focus on water supply and wastewater, and 15 contributed to forests and land use. Table 3.1 provides an overview of the total number of projects between 2016 and 2018, which aimed to address issues across the different sectors.

20 'Readiness' activities are climate-related actions that support government policy, planning, capacity building and administrative processes associated with climate change activities.

21 UNFCCC (no date), The Paris Agreement, available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

22 See European Union, 'A short guide to the use of Rio markers', available at: https://europa.eu/capacity4dev/public-environment-climate/wiki/short-guide-use-rio-markers, for more detail.

Figure 3.1 Total climate finance flows for the period 2016–2018[23]

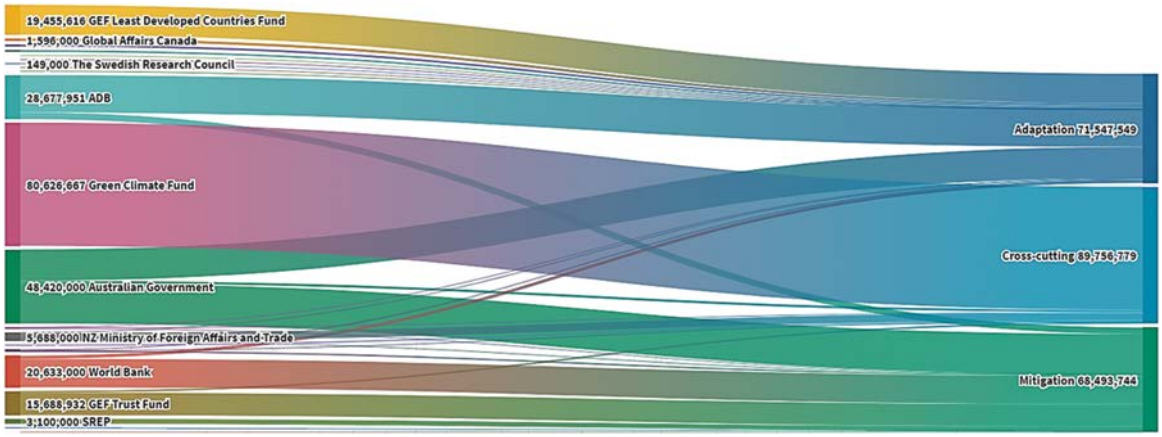


Table 3.1 Number of climate financed projects per sector 2016–2018[24]

Sector	No.
Energy generation and access	11
Transport	5
Waste	3
Forests and land use	15
Resilient infrastructure	2
Agriculture	9
Water supply and wastewater	16
Ecosystem and ecosystem services	17
Livelihoods and disaster risk reduction	11
Health	1
Readiness	8
Total Projects	98

3.4 Methodology for undertaking gap analysis

The national targets, goals and commitments summarised in Chapter 2 and the sectoral priorities summarised in Chapter 5 provide the baseline for determining the climate financing gaps. In Chapter 5, the progress in achieving national and sectoral targets, goals and commitments is assessed based on the criteria outlined in Table 3.2. This assessment is based on a qualitative screening of

23 Diagram is author's own. The source of the data is from the various funding providers websites, and OECD-DAC. The data from OECD-DAC is available here: https://www.oecd.org/development/stats/climate-change.htm

24 A number of projects contributed to multiple sectors. The source of the data is from the various funding providers websites, and OECD-DAC. The data from OECD-DAC is available here: https://www.oecd.org/development/stats/climate-change.htm

Table 3.2 Criteria for assessing climate finance inflows into sectors[25]

Status	Criteria
Satisfactory progress	• Climate finance inflows are sufficient and are aligned to national and sectoral plans, targets and goals. • Data available.
Limited progress	• Limited climate finance inflows and/or climate finance projects are not aligned to national and sectoral plans, targets and goals. • Data available.
Limited data on progress	• Limited baseline of projects (e.g. no project pipeline in national/ sectoral plans). • Limited data on climate finance inflows.

the climate finance received in a sector (which is summarised in Table 3.1 and is further elaborated in Chapter 5) in relation to the climate change related national and sectoral plans, targets and goals.

Based on this assessment, the sectoral investment needs are determined for both mitigation and adaptation actions.

25 *Author's own analysis.*

4. Access and Utilisation of Data

Space applications and geospatial technology are evolving, and the usage of these geospatial services is expected to dramatically increase in the coming years. Pacific island countries have an opportunity to make use of existing geospatial technology and explore emerging applications in geospatial data.

This opens opportunities for Solomon Islands to maximise the technology for undertaking climate change actions and designing and implementing projects and programmes. Space applications can contribute to achieving the goals set out in the United Nations Framework Convention on Climate Change, the Paris Agreement and the 2030 Agenda for Sustainable Development.

The applicability and utilisation of satellite remote sensing (SRS) [26] and Earth Observation (EO)[27] data for climate change projects in each sector/thematic area are outlined in Chapter 5.

The Solomon Meteorological Service (SIMS), under the Ministry for Environment, Climate Change, Disaster Management and Meteorology (MECDM), is responsible for climate data collection, database management, seasonal forecasting, technical analyses and climate change assessments for Solomon Islands.

Despite advances in the availability and quality of space applications and geospatial information, several gaps and challenges remain.

- The country is still not connected with submarine cables and the majority of the islands are connected via satellite, which makes it difficult to access high bandwidth internet. A planned submarine fibre-optic cable between Honiara and Sydney is yet to be developed.
- In general, the present utilisation of EO data for project design is limited in Solomon Islands. The data used for climate change projects are ad hoc and utilisation has not taken place in a strategic manner.
- There is need to develop the capacity to collect, manage, and generate climate knowledge for adaptation and mitigation priorities. Solomon Islands has low awareness and limited capacity and capabilities for using EO data, which restricts the potential for scaling up EO data applications in Solomon Islands.
- There is a lack of co-ordination and information-sharing between institutions, which acts as a barrier for EO data utilisation. Many institutional and financial barriers to data access also exist, including the high cost of data collection and processing, and difficulties centralising, securing and sharing different types of data across institutions.[28]
- There are no centralised data storage facilities to access data by different stakeholders.

The barriers to accessing and utilising data, and solutions to overcome these challenges, are further described in section 6.3.

26 A remote sensing satellite carries one or more instruments for recording images of the Earth, which are transmitted to a receiving station using radio waves. Remote sensing is the action of collecting images or other forms of data about the surface of the Earth, and subsequent processing/analysis.

27 Earth observations are observations from above using technologies such as aircraft, satellites and various sensors to create images that are used to study what is happening on or near the surface of the Earth.

28 Harper, A, G Elley and A Porteous (no date), *Challenges and strategies for climate monitoring in the Pacific*, available at: https://www.wmocimo.net/eventpapers/session4/O4(3)_Harper_Challenges_Pacific.pdf

5. Sector Assessments

Solomon Islands is one of the most vulnerable countries in the world to climate change and natural disaster risks. The island nation suffers from cyclones, drought, extreme precipitation, sea-level rise and associated landslides and flooding. The exposure of Solomon Islands to natural hazards will become more intense because of climate change.

Solomon Islands has estimated annual GDP losses of almost 2.99 per cent due to extreme events and is also ranked as the fourth most at-risk country globally in the 2019 World Risk Index report.[29,30] Solomon Islands' risk is driven by its location in the 'Pacific Ring of Fire' and Pacific 'cyclone belt', and its sensitivity to the impact of natural hazards and very low levels of adaptive capacity.

The aggregate GHG emissions of Solomon Islands are approximately 20 tCO_2e/year, which represents only 0.01 per cent of global emissions. The per capita greenhouse gas emissions are also very low by global standards at an estimated 1.2 tCO_2 per person in 2015.[31] GHG emissions in Solomon Islands predominantly come from the following sources: energy, transport, agriculture and waste. In 2010, when national emission accounts were previously reported, the largest contributor to GHG emissions was transport subsector energy emissions (176.91Gg [gigagram] CO_2e) and emissions from solid waste disposal on land (144.21Gg CO_2e). Over the 2010–2020 period, GHG emissions are likely to have increased in Solomon Islands due to the commencement of new large-scale mining and plantation industries.[32]

5.1 Transport

5.1.1 Profile

The government's vision for the transport sector is effective transport infrastructure and services that support sustained economic growth and social development in Solomon Islands. The country's transport sector includes land, maritime and aviation subsectors. Solomon Islands National Transport Plan (NTP) 2017–2036 is the long-term master plan guiding development of transport infrastructure across Solomon Islands.[33]

Achieving sustainable development across Solomon Islands is constrained by expensive, unreliable and limited transport infrastructure and services. The vision of GoSI is to provide effective transport infrastructure and transparent services to sustain growth and social development in Solomon Islands.

At present the road network is spread over 30 islands and covers 1,751km with 188 bridges, yet reaches only about a quarter of rural villages.[34] Only 67 per cent of roads are in maintainable condition while the rest need substantial rehabilitation to become maintainable. Similarly, out of the 91 domestic wharves, only 46 are in maintainable condition; and only 6 out of 22 airfields have regular flights, and the infrastructure of domestic airports is in poor condition.[35]

Transport infrastructure in Solomon Islands is presently exposed and vulnerable to natural hazards and climate change hazards, which has resulted in social and economic impacts, including reduced connectivity.

Poor road conditions are likely to affect key sectors, especially agriculture and tourism. The transport sector in Solomon Islands is potentially at risk due to heavy rainfall, extreme weather events, sea-level rise and high temperatures, and associated coastal and inland flooding and landslides, which could result in damage to road, bridges, airports and ports. The impact of climate change on transport infrastructure in Solomon Islands is also likely to be exacerbated by poor maintenance, which is currently an issue in Solomon Islands. A comprehensive climate change risk assessment

29 OECD, World Bank (2016), Climate and Disaster Resilience Financing in Small Island Developing States, Organisation for Economic Co-operation and Development (OECD) and World Bank, Washington, DC.
30 Bündnis Entwicklung Hilft (2019), *WorldRiskReport 2019*.
31 Government of Solomon Islands (2015), Nationally Determined Contribution.
32 Government of Solomon Islands (2017), Second National Communication.
33 Government of Solomon Islands (2017), National Transport Plan 2017–2036.
34 Government of Solomon Islands (2016), National Development Strategy 2016–2035.
35 ADB (2018), Proposed Technical Assistance Grant Solomon Islands: Transport Sector Project Development Facility.

in the transport sector has not been undertaken, which is a priority for GoSI to undertake.

In the April 2014 floods, for example, the estimated total damage and loss for transport infrastructure was SI$103.7 million (US$14.2 million). The transport infrastructure affected by the in the floods included the road and bridge network across Guadalcanal, Makira, Malaita, and Isabel Provinces, and the international and domestic terminals at Henderson Airport in Honiara.[36]

The transport sector is also a key source of GHG emissions, including fuel usage for road transportation and also for air and sea transport. In Honiara, for example, rapid urbanisation and associated increases in private vehicle ownership have put urban roads under stress. There is peak hour traffic congestion in Honiara, and the annual congestion costs associated with the increasing number of vehicles in Honiara is estimated at 44 per cent of GDP.[37] There are limited public transport options in Solomon Islands. At present, these include limited bus services in Honiara, ad hoc transport by private vehicles, and water taxi services.

The transport sector (road vehicles) was the largest source of GHG emissions in 2010, contributing 28.6 per cent of Solomon Islands' total GHG emissions. While more recent data are not available, it is likely that road transport emissions will have increased over 2015–20.[38] The NTP 2017–2036 does not include any low-carbon transport projects in its pipeline of project priorities for 2017–2036.

The development of low-carbon climate resilient transport systems in Solomon Islands will result in a number of co-benefits, which include:

- health benefits from reduced GHG emissions in the transport sector, including increases in physical activity and reductions in mortality from pollution;[39]
- increased asset life and reduced repair and maintenance costs, as preparing for climate change at the outset can avoid the need for costly retrofitting and reduce the risk of the asset becoming damaged due to climate hazards and/or prematurely obsolete;[40] and
- improved connectivity and reduced risk of climate hazards causing disruption to transport networks, which will result in economic and social benefits from improved mobility and increased access to markets, jobs and public services (such as education and healthcare).

Investment in the transport sector is prioritised in the NTP 2017–2036, which sets out a strategic and policy framework to maintain and develop physical infrastructure, develop transport services, and improve the capacities of government agencies and the private sector for the delivery the services in the transport sector. Its key outcome is establishing effective transport infrastructure and services. The Medium Term Transport Action Plan of the NTP 2017 is considered a living document and will be regularly updated to provide a rolling pipeline of projects, including capital projects and maintenance activities. The MID Guidance Manual for managing climate change risks in transport civil works programmes apply to the projects implemented under the NTP. Moreover, the NTP states that climate risks to the transport sector will be addressed through improved design standards and the selection of sub-projects that help to protect the transport network.[41]

5.1.2 Access to climate finance

The majority of climate change focused projects in the transport sector in Solomon Islands have focused on building resilience. Solomon Islands have successfully accessed finance for the following projects, which have a strong climate change component:

- The National Transport Fund (NTF) was established in 2009 with the assistance of Pacific Region Infrastructure Facility (PRIF) partners. The NTF now manages over 130 active transport maintenance and rehabilitation projects.[42] Funds from the NTF may be expended only on those projects

36 Government of Solomon Islands (2014), Rapid Assessment of the Macro and Sectoral Impacts of Flash Floods in Solomon Islands, April 2014.
37 ADB (2018), Greater Honiara Urban Development Strategy and Action Plan (Volume I).
38 Government of Solomon Islands (2017), Second National Communication.
39 Shaw, C, S Hales, P Howden-Chapman and R Edwards (2014), 'Health co-benefits of climate change mitigation policies in the transport sector', *Nature Climate Change* 4, 427–433, available at: 10.1038/nclimate2247.
40 OECD (2018), *Climate-resilient Infrastructure*, OECD Environment Directorate.
41 Government of Solomon Islands (2017), National Transport Plan 2017–2036.
42 Ibid.

specified in NTP or those that are consistent with NTP policy. The establishment of the NTF has led to increased government and development partner contributions to the transport sector. About 87 per cent of its funds (SI$313 million) during 2011–16 were allocated to maintenance works. As a result, the length of all roads under regular maintenance increased from 20 per cent in 2011 to 42 per cent in 2016. The NTF, moreover, has been identified as a candidate by GoSI for accreditation as Direct Access Entity to the GCF, and has received support from the USAID Climate Ready project.

- The Sustainable Transport Infrastructure Improvement Program (STIIP) is under implementation. This is a US$78 million programme jointly financed by ADB and the Governments of Australia and Solomon Islands to support the implementation of the road and maritime projects prioritised by the MTTAP and financed through the NTF.[43]
- The Transport Sector Project Development Facility, funded by the ADB and approved in 2018, strengthens the design and development of climate change resilient transport projects in the roads, maritime and aviation sectors.[44]
- Solomon Islands Roads and Aviation Project, funded by the World Bank and approved in 2019, supports the improvement of airport and road infrastructure and institutional strengthening. This project has a focus on strengthening and maintaining roads in Malaita to improve climate resilience.[45]
- Previously, the Government of Solomon Islands, in partnership with the Government of Australia's Pacific–Australia Climate Change Science and Adaptation Planning Program, developed a guidance manual for the systematic incorporation of climate change considerations in transport sector infrastructure development.

43 ASB, Solomon Islands: Sustainable Transport Infrastructure Improvement Program, available at: https://www.adb.org/projects/46499-002/main

44 ASB, Solomon Islands: Transport Sector Project Development Facility, available at: https://www.adb.org/projects/51214-001/main

45 World Bank, Solomon Islands Roads and Aviation Project, available at: https://projects.worldbank.org/en/projects-operations/project-detail/P166622?lang=en

Table 5.1 Status of climate finance projects in the transport sector[46]

Financing priority	Low-emissions transport projects, climate resilient road projects
Financing status (adaptation)	Satisfactory progress: Climate finance projects are largely aligned with the NTP 2017-2036.
Financing status (mitigation)	Limited data on progress: Limited baseline for low-emissions transport projects

The key financiers at present in the transport sector include the ADB, World Bank, the Government of Australia and JICA. An estimated five projects have been funded by climate finance between 2016 and 2018 to address transport challenges. These projects are listed in Appendix A. Table 5.1 provides the status of climate finance projects in the transport sector.

There has been a strong focus on developing climate resilient roads and airports, but there have been few projects focused on reducing GHG emissions in the transport sector. While this is not a priority area for reducing emissions and is not a part of the NDC, reducing transport sector emissions is included in the Second National Communication.[47] Potential projects to reduce transport emissions are listed in Table 5.2.

In addition, Table 5.3 details the key sources of financing for the transport sector in Solomon Islands.

5.1.3 Potential data utilisation and application

The Pacific Catastrophe Risk and Financing Initiative of SPC/SOPAC, World Bank and the Asian Development Bank launched the first geographic information system (GIS) initiatives in Solomon Islands in 2012. A fully capable GIS and SRS division is in place under the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM). For climate change adaptation projects, SRS data could be used as follows:

46 *Author's own analysis.*

47 Government of Solomon Islands (2017), National Transport Plan 2017–2036.

Table 5.2 Actions in the transport sector[48]

Action	NDS 2016–2035	SI NIIP 2013
Ensure maintenance and rehabilitation of existing roads is effectively carried out.	✓	✓
Expand road networks to connect inland communities to coastal roads and maritime networks and to provide access to agricultural land and for rural communities.	✓	✓
Facilitate private sector provision of rural transport services through improved infrastructure; improve safety of public transportation modalities such as bus services, inter-village pickup transport, scheduled motorised canoe services and canoe-based water taxi service.	✓	×
Upgrading and climate proofing of airports, including to reduce flood risks.	×	✓
Construction and rehabilitation of ports and maritime facilities.	×	✓
Create a safer maritime environment for the transport of people and goods and economic development through trade and tourism; identify priority maritime areas within Solomon Islands waters where there are significant, heightened, and moderate risks to maritime transport.	✓	×

Table 5.3 Key sources of financing for the transport sector[49]

Financing instruments	Grant and loan financing
Financing sources	GCF, MDBs (e.g. ADB and WB), bilateral donors

- Earth Observation (EO) data (i.e. Kacific, Sentinel-2, Himawari-8) can be used to monitor the impacts of climate change stressors or hazards (heavy rainfall and sea-level rise, and associated coastal and inland flooding and landslides and soil erosion) on road networks and bridges over time. This information can be used to inform policy-makers of transport infrastructure that is most at risk and in need of maintenance – for example, EO data can be used to ascertain the condition of roads and bridges, including the presence of transport infrastructure damage and deformation.
- The construction and upgrading of roads, including the viability of constructing roads in inaccessible areas, can be designed, evaluated and monitored cost effectively by EO data. Drone and satellite images are frequency used in transport planning, road alignment, outer islands wharf design in Solomon Islands. Recently, under the World Bank Project, SRS data were used to understand road cut-off points in the 2014 floods and under future climate change scenarios.[50] Satellite data can also be used to monitor the economic impact of past, current, and future transport projects, which could include the benefits to rural communities and farmers from improved connectivity.

EO data could also be used for investment decision-making and monitoring for climate change mitigation projects (e.g. NASA's new Orbiting Carbon Observatory-2 space satellite could be used to probe the carbon cycle). And, if in the future GoSI plans to establish a public transport system (e.g. electric buses), EO data could be used to inform route design and infrastructure development.

48 *Author's own analysis.*
49 Ibid.
50 Global Facility for Disaster Reduction and Recovery (2021), Honiara Flood Risk Management Study and Plan.

While SRS data provide numerous opportunities to strengthen decision-making and realise cost efficiencies, conventional methods of data collection are still necessary. It is also important that data collected through surveys are used to inform climate change projects, and this includes the present trip distances per mode of transport and the projected mode shift for users. These data would be required to calculate the potential future demand for particular modes of transport, and therefore the expected economic benefits.

5.2 Energy

5.2.1 Profile

The energy sector is a critical driver of human and economic development in Solomon Islands through provision, for example, of reliable and efficient lighting and cooking, clean water, sanitation, transport, telecommunication services and health and education services. The energy sector in Solomon Islands is characterised by very high dependency on petroleum fuel imports for electricity generation and transport, leading to high energy costs.

Access is extremely low outside of Honiara, with unreliable and unaffordable energy services, particularly in rural communities. The total energy generated in 2012 was 84 gigawatt hours (GWh), of which 90 per cent was in Honiara. In 2009, 11.8 per cent of households in Solomon Islands were connected to Solomon Islands Electricity Authority (SIEA) electricity grid. An additional 0.7 per cent of households had their own generator and 8.7 per cent were supplied by solar, indicating a total household electrification rate of 21.2 per cent.[51]

Solomon Islands has considerable domestic renewable energy resources. A summary is provided below:[52]

- Hydropower: Due to year-round river flows and good hydrology, hydropower has significant potential both for large-scale supply to main grids and distributed supply to rural mini-grids.
- Solar photovoltaic (PV): There is significant potential for expanding both grid-connected and distributed solar generation. Off-grid solar solutions, such as solar home systems, are easily implemented, avoiding potential issues of land acquisition and resettlement.
- Biomass: Biomass gasification is potentially viable in areas where a waste stream is located near a load centre, but options may be limited due to technical complexity. There is limited potential for use of biomass direct combustion as a source of power generation, as this is more suited to processes where there is a sufficient availability of combustible by-products. Further research is needed to understand the potential of biomass power generation in Solomon Islands.

While there is considerable renewable energy potential, limited electricity has been generated from renewable energy sources in Solomon Islands. In 2009, the share of renewable energy for power generation in Solomon Islands was only 0.6 per cent.[53] The share of electricity generated by renewable energy (hydro and solar PV) on the Honiara grid is expected to increase to 67 per cent in 2022, when the Tina River Hydropower Development project is commissioned, from 3 per cent in 2017.[54]

Fuel wood is used by an estimated 93 per cent of the population as their main fuel for cooking and kerosene is the main source of home lighting. Among rural households in 2009, 98.7 per cent used an open fire for cooking and 79 per cent used kerosene or a spirit for lighting. The use of fuel wood contributes to localised deforestation and indoor air pollution, resulting in environmental and public health impacts. Therefore, transitioning to renewable energy generation and increasing household access to improved energy sources will result in improved health, poverty and environmental outcomes as well as reduced GHG emissions.[55]

In Solomon Islands National Energy Policy (SINEP) and Strategic Plan 2014, GoSI has put forward

51 Climate Investment Funds (2014), Scaling-up Renewable Energy in Low-Income Countries (SREP) – Investment Plan for Solomon Islands.

52 Climate Investment Funds (2014), Scaling-up Renewable Energy in Low-Income Countries (SREP) – Investment Plan for Solomon Islands.

53 Government of Solomon Islands (2014), Solomon Islands National Energy Policy 2014.

54 Green Climate Fund (2017), FP044: Tina River Hydropower Development Project.

55 Climate Investment Funds (2014), Scaling-Up Renewable Energy in Low-Income Countries – Investment Plan for Solomon Islands.

Table 5.4 National Energy Policy and Strategic Plan subsector goals

Subsector	Goals
Planning, co-ordination, leadership and partnership	Strengthen the energy sector leadership and planning.
Electric power (urban)	Increase access to electricity in urban areas to 100% by 2020.
Electric power (rural)	Increase access to electricity in rural households to 35% by 2020.
Renewable energy	Increase the use of renewable energy sources for power generation in urban and rural areas to 79% by 2030.
Petroleum and alternative and gaseous fuels	Increase access of safe, affordable and reliable petroleum fuels to outer islands and remote rural locations. Increase the development and reach of gaseous fuels and alternative liquid fuels from indigenous raw materials.
Energy efficiency and conservation	Improve energy efficiency and conservation in all sectors by 10.7% by 2019.

ambitious goals for increasing energy access and renewable energy development. SINEP provides an enabling platform for improving the effectiveness of Solomon Islands energy sector and achieving the NDS through increased access to reliable, affordable and clean sources of electricity. Environment and climate change are a guiding principle of SINEP, and efforts to reduce the carbon footprint through the use of renewable energy technologies and energy efficient measures are considered an important part of this energy policy.

SINEP includes a number of subsector goals as outlined in Table 5.4.[56]

The development of low-carbon energy systems in Solomon Islands will result in a number of co-benefits in addition to GHG emissions reduction:

- Increased access to energy underpins sustainable development. At a basic level, modern energy is used for the provision of clean water and sanitation and for effective delivery of healthcare as well as education and knowledge services. Widespread and affordable energy access can help provide reliable and efficient lighting, heating, cooking, mechanical power, and transport and telecommunication services.[57]
- Overall energy security is expected to increase, as the resilience of the energy supply will be strengthened and the exposure to fossil fuel price fluctuations will decrease, which will also result in improved macro-economic outcomes.
- Increased usage of renewable energy will result in employment opportunities. Over the long term, employment in the energy sector could be considerably higher due to construction and maintenance of renewable energy systems.

5.2.2 Access to climate finance

GoSI has been able to mobilise resources from several development partners in support of energy sector targets, with significant commitments made towards renewable energy development and increasing energy access. Climate finance has been successfully mobilised for a number of projects in the energy sector, and these include:

- Tina River Hydropower Development project (funded by the GCF with co-finance from a number of partners, including the World Bank);[58]
- electricity access and grid extension projects, including mini-grids (funded by GEF, Climate Investment Funds [CIF], World Bank, ADB, SIDS DOCK[59], MFAT);

56 Government of Solomon Islands (2014), Solomon Islands National Energy Policy 2014.
57 Ibid.
58 Green Climate Fund (2017), FPO44, Tina River Hydropower Development Project, available at: https://www.greenclimate.fund/project/fp044
59 SIDS DOCK is an initiative among member countries of the Alliance of Small Island States (AOSIS) to help SIDS transform their energy sectors and address adaptation to climate change.

Table 5.5 Status of climate finance projects in the energy sector[60]

Financing priorities	Increasing rural access and RE generation, and implementing energy efficiency measures.
Financing status	Satisfactory progress over 2016-2020: But additional assistance is needed, and improved data are required for tracking progress against goals and targets.

Table 5.6 Actions in the energy sector[61]

Action	SINEP 2014	NDC 2015	SI NIIP 2013
Developing a renewable energy investment plan – including hydropower, solar and geothermal projects.	✓	✓	✓
Rural electrification programme – including solar projects (e.g. solar home systems), and mini- and micro-hydro projects.	✓	✓	✓
Outer island renewable energy supplies.	✓	✓	✓
Promote the use of renewable energy technologies in rural schools and health centres.	✓	×	×
Geothermal energy studies, including mapping, geophysical analysis, and completion of feasibility studies.	✓	×	✓
Biomass energy development, including biomass gasification, direct combustion of biomass, biomass power – coconut oil, and the use of biodiesel. Undertaking biofuel energy assessment to identify opportunities and feasibility of projects.	✓	×	✓
Undertaking assessment to explore ocean energy and wind power opportunities.	✓	✓	×
Implementing energy efficiency measures, including lighting improvements in buildings, appliance and labelling standards, and equipment retrofits and improvements.	✓	×	×
Grid extension, and development of micro- and mini-grids for renewable energy electrification, particularly in rural areas.	✓	×	×
Training and capacity development.	✓	×	×
Strengthening policies, regulations and legislation and capacity, including public-private partnership policy for power generation, building technical capacity, and improving co-ordination between national, local and provincial governments.	✓	×	×

- hydroelectricity, solar PV and biomass projects (funded by the ADB, MFAT, DFAT, Export-Import Bank of Korea);
- biofuel-fired power plants (funded by MFAT); and
- Capacity Building and Sector Reform for Renewable Energy Investments in the Pacific (regional project funded by the ADB).

Approximately 11 projects have been funded by climate finance between 2016 and 2018 to address issues around energy generation and access. These projects are listed in Appendix A. Table 5.5 provides an overview of the status of climate finance projects in the energy sector.

While significant progress has been made in recent years, additional assistance is required. Future projects should be aligned with the SINEP 2014, NDC 2015, and SI NIIP 2013, all of which outline actions and projects in the energy sector to reduce GHG emissions. Financing priorities in the energy sector are shown in Table 5.6.

60 *Author's own analysis.*
61 Ibid.

Table 5.7 Key sources of climate financing for the energy sector[62]

Financing instruments	Grants, concessional loans, equity and guarantees (potential to mobilise climate change finance from public and private financing sources)
Financing sources	The range of finance sources for the energy sector include climate funds (e.g. GCF, GEF, CIF), MDBs (e.g. ADB, WB), other multilateral agencies (e.g. UNDP, GGGI, IRENA), and bilateral donors (e.g. MFAT, DFAT, JICA)

In addition, Table 5.7 details the key sources of financing for the energy sector in Solomon Islands.

5.2.3 Potential data utilisation and application

SRS data can be used to inform the design and monitoring and evaluation of energy supply and energy access projects. EO data can transform energy exploration, site planning, asset management and infrastructure monitoring. In particular, SRS data can be used as follows:

- Mini-grid development in Lambi in Guadalcanal Province, Santa Ana and Ulawa in Makira province used SRS and EO data for measuring network routes, tee-junctions, line angles and terminations, power pole positions and pole-to-pole distances.[63]
- The data could identify communities that are not connected to the grid and suitable areas for grid extension. More specifically, satellite data could be used as a resource for identifying unelectrified areas, ideal siting locations for grid expansion and areas suitable for self-sustaining micro-grids, to help in meeting electrification goals.[64]
- As an M&E tool, satellite data could be used to determine the level of grid access achieved following a project, and whether energy access targets and goals are being achieved.
- SRS data could be used in design of hydroelectricity projects, including assessing water quantity and availability, determination of ideal dam locations and reservoir size, and environmental impact from rerouting or damming water, and monitoring (such as conducting dam safety assessments). It is also possible to use satellite data for assessing geothermal resources across large land areas. While SRS data can be used for solar resource mapping and wind resource mapping, accuracy is often better using other methods (such as ground-based assessments and lidar). SRS data can, however, be used for siting of energy installations, environmental impact assessments, and monitoring of construction progress.

Additional data are also required to improve the strategic planning and design of renewable energy and energy efficiency projects – this includes data on household energy access (particularly for remote communities), data on biomass usage (to determine the mix of energy sources), and data on energy efficiency potential (to set realistic targets and begin energy efficiency initiatives). Lastly, data are also required to update targets in the SINEP 2014, and to determine whether Solomon Islands is on track for achieving the 2020 and 2030 renewable energy and electrification targets.

5.3 Forests and land use

5.3.1 Profile

In 2016, forests covered an estimated 90 per cent of the 28,000 square kilometres of land in Solomon Islands.[65] Forest resources are an integral driver of rural livelihoods, contributing to employment, welfare and economic development. The forestry sector is also a major contributor to the Solomon Islands economy, accounting for approximately 10 per cent of GDP.[66]

In 2016, 55 per cent of Solomon Islands forested area was undisturbed, with 20 per cent disturbed by commercial logging and 15 per cent disturbed

62 Ibid.
63 Solomon Islands Electricity Authority (2017), Solomon Islands electricity access and renewable energy expansion project - Phase II, December.
64 Leibrand, A, N Sadoff, T Maslak and A Thomas (2019), Using Earth Observations to Help Developing Countries Improve Access to Reliable, Sustainable, and Modern Energy, Frontiers in Environmental Science, 7:123, available at: https://doi.org/10.3389/fenvs.2019.00123
65 Government of Solomon Islands (2019), State of the Environment Report 2019.
66 Ibid.

by agriculture.[67] With log exports having increased from an estimated 500,000 cubic metres in 2002 to about 2.5 million tonnes in 2016, Solomon Islands is estimated to be felling its tropical forests at around 12–14 times the sustainable rate.[68] A number of forested areas have been designated terrestrial conservation areas, but these have not been formalised. Logging and land clearance for agriculture purposes pose major threats to ecosystems and biodiversity, including key watersheds. Logging is a major source of GHG emissions in Solomon Islands, which is estimated to make the country one of the largest GHG emitters per capita in the Pacific.[69] It is estimated that 77 per cent of the Solomon Islands' GHG emissions have come from forestry and land-use change in recent years.[70]

A number of climate change hazards will impact forest ecosystems, including a possible increase in invasive species and diseases and extreme weather events and cyclones damaging forest ecosystems.[71] Solomon Islands' forest ecosystems also offer opportunities for climate change mitigation through conservation (e.g. increasing protected areas), afforestation and reforestation activities, and carbon substitution (e.g. replacement of carbon intensive products and fuels with wood products).

The National Forest Policy (2020) outlines strategies, objectives and results statements for achieving GoSI vision of ensuring that 'forest resources and ecosystems are sustainably and responsibly managed for the benefit and resilience of all Solomon Islanders'. The policy outlines 17 goals to achieve forest conservation, sustainable forest management, forest economics and marketing outcomes, capacity building, improved community governance, strengthened monitoring and law enforcement, and improved transparency and integrity outcomes.

The national REDD+ Roadmap was formulated and endorsed by the cabinet in November 2015 to guide the process for participation in REDD+ mechanisms and to enable Solomon Islands to access result-based payments from reducing forest emissions. The national REDD+ Program is under development and recent activities have included establishing institutional arrangements, raising stakeholder awareness, preparation and submission of a National REDD+ Forest Reference Level, and piloting of REDD+ activities.[72]

Solomon Islands National Biodiversity Strategies and Action Plan (NBSAP), which is aligned to the NDS, has been implementing a target of 10 per cent terrestrial protected area by 2020. While GoSI has ambitious goals and targets in place to reduce deforestation and improve the management of forest resources, limited financial and human resources have limited implementation and enforcement, including of the Forestry Act and Code of Logging Practice.[73]

The REDD+ Readiness Roadmap prioritises sustaining livelihoods of Solomon Islanders.[74] The forest ecosystem is critical in ensuring this because, despite many years of significant forest degradation because of logging operations, many communities continue to depend on forests for their livelihoods. The REDD+ Readiness Roadmap puts forward measures and processes to protect the rights of forest resource owners. The strategic recommendations in the Roadmap include strengthening institutional and systemic processes within central government, and also inclusive measures to support resources owners with harnessing forest resources. This vision for the REDD+ readiness process will be achieved through delivering four main objectives:

- to reduce GHG emissions from the forest sector;
- to maximise the benefits of REDD+ for the people of Solomon Islands by ensuring the sustainable management of their resources and promotion of their rights to those natural resources;

67 Ibid.
68 Ibid.
69 Land-use change and forestry emissions were not estimated in Solomon Islands Second National Communication.
70 Government of Solomon Islands (2020), National Forest Policy.
71 Forest Carbon Partnership Facility (2017), Addressing the Drivers of Deforestation and Forest Degradation - Policy Brief.
72 UNDP (2016), Proposed best practices, financial and economic instruments to implement the REDD+ Readiness Roadmap in the Solomon Islands, available at: http://www.reddplussolomonislands.gov.sb/index.php/resources/documents-reports/56-best-practices-to-implement-solomon-islands-national-redd-roadmap/download.html
73 Government of Solomon Islands (2016), The National Biodiversity Strategic Action Plan 2016–2020.
74 Government of Solomon Islands (2014), Solomon Islands REDD+ Readiness Roadmap 2014–2020.

- to increase understanding of the different values of forests within environmental decision-making; and
- to reduce vulnerability of rural communities through effective management of their natural resources.

In order to achieve the objectives above, the REDD+ Roadmap also outlines 17 strategies with associated strategic actions. At a high level, these 17 strategies involve integrating REDD+ into existing policies and programmes, REDD+ safeguards, stakeholder engagement, financial management and benefit sharing mechanisms, national forest monitoring systems, emissions and forest reference levels and piloting of REDD+ activities.

The implementation of forestry and land-use sector projects in Solomon Islands will have a number of co-benefits in addition to GHG emissions reduction:

- Forestry and land-use sector mitigation options can promote conservation of biological diversity, both by reducing deforestation and by using reforestation/afforestation to restore biodiverse communities.[75]
- Forestry sector projects may also support the regulation of the hydrological cycle and protection of watersheds, reduce erosion, and improve soil quality and fertility.[76]
- Economic co-benefits could include carbon payments or compensation mechanisms that may provide a new source of finance, particularly for rural communities. Moreover, mitigation payments may help to make production of non-timber forest products (NTFP) economically viable, which would further diversify incomes at the local level.[77]
- Forestry and land-use projects should be well designed to account for potential adverse side-effects, which could include impacts on land tenure and land-use rights, food security through potential reduction in local food production, water depletion due to irrigation, and economic impacts resulting from decreased employment and household income.[78]

5.3.2 Access to climate finance

The forestry sector has received a significant amount of climate finance in recent years, which could be due to the high rate of deforestation in Solomon Islands. Key projects that have been successful in accessing climate change finance in recent years have included:

- Integrated forest management in a project which aims to assist GoSI to implement integrated management of protected and productive forest landscapes for sustainable community development and multiple environmental benefits (funded by GEF and FAO).[79]
- Projects have supported the protection and sustainable management of forests, and the ecosystem services they provide, through delivery of alternative sources of revenue for landowners, including beekeeping (projects have been funded by MFAT, JICA, and the German government).
- Support on REDD+, including developing its national REDD+ Program and piloting of project-level REDD+ activities (projects have been funded by GEF, FAO UN-REDD programme, UNDP, SPC and GIZ).
- In addition, there are also ecosystem-based adaptation projects, such as the Pacific Ecosystems-based Adaptation to Climate Change project (funded by German government and implemented by SPREP), which have a forestry focus.

Approximately 15 projects have been funded by climate finance between 2016 and 2018 to address issues in the forest and land-use sector. These projects are listed in Appendix A. Table 5.8 provides

75 Smith P, M Bustamante, H Ahammad, H Clark, H Dong, EA Elsiddig, H Haberl, R Harper, J House, M Jafari, O Masera, C Mbow, NH Ravindranath, CW Rice, C Robledo Abad, A Romanovskaya, F Sperling and F Tubiello (2014), 'Agriculture, Forestry and Other Land Use (AFOLU)', in Edenhofer, O, R Pichs-Madruga, Y Sokona, E Farahani, S Kadner, K Seyboth, A Adler, I Baum, S Brunner, P Eickemeier, B Kriemann, J Savolainen, S Schlömer, C von Stechow, T Zwickel and JC Minx (Eds), *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

76 Ibid.

77 Ibid.

78 Ibid.

79 GEF, Integrated Forest Management in the Solomon Islands, available at: https://www.thegef.org/project/integrated-forest-management-solomon-islands

Table 5.8 Status of climate finance projects in the forestry sector[80]

Financing priorities	Afforestation and reforestation programmes, implementation of climate adaptation actions, development REDD+ institutions and processes, capacity building and training.
Financing status	Satisfactory progress: Additional assistance is needed given the high rate of deforestation.

Table 5.9 Actions in the forests and land-use sector[81]

Action	REDD+ Readiness Roadmap 2014–2020	National Forest Policy 2020
Encourage reforestation and replantation schemes to enhance forest carbon stocks.	✓	
Work towards NBSAP target of 10% terrestrial area protected by 2020.	×	✓
Implement REDD+ activities, including pilot projects and implementing REDD+ Roadmap activities.	✓	✓
Undertake sustainable forestry, including promoting agroforestry and forestry plantations and discouraging of logging outside approved 'logging concession areas'.	×	✓
Promote downstream processing of timber and build the processing industry.	×	✓
Strengthen institutions and governance, including reviewing of the Forestry Act, enforcement of logging permits and monitoring of forest changes.	✓	✓
Establish a remote sensing unit within the Ministry of Forestry and Research.	×	✓

Table 5.10 Key sources of climate financing for the forestry sector[82]

Financing instruments	Grants, REDD+ finance
Financing sources	Key sources of climate finance could include GCF REDD+ Pilot Programme, GEF, AF, CIF (Forest Investment Program), MDB (e.g. ADB, WB), UN agencies (FAO, IFAD and UNDP), and bilateral donors.

an overview of the status of climate finance projects in the forestry sector.

Additional assistance is needed to achieve climate change mitigation and adaptation outcomes in the forestry and land-use sector. Key activities are outlined in Table 5.9.

In addition, Table 5.10 details the key sources of financing for the forestry sector in Solomon Islands.

80 *Author's own analysis.*
81 Ibid.
82 Ibid.

5.3.3 Potential data utilisation and application

SRS data can be used for measuring and mapping deforestation and afforestation/reforestation changes, which would be useful for designing and monitoring land-use change, forestry and REDD+ activities.[83]

83 FAO, REDD+ Reducing Emissions from Deforestation and Forest Degradation, available at: http://www.fao.org/redd/areas-of-work/national-forest-monitoring-system/en/

- The Pacific Catastrophe Risk and Financing Initiative developed a GIS database using satellite images at a scale of 1:50,000 showing the location of major crops, agriculture and forests (including mangroves and forest plantations, pasture land and settlement areas).
- Previously, Global Forest Watch used SRS imagery to measure forest cover change, and determined that there was an increasing trend in the rate of tree cover loss in Solomon Islands between 2001 and 2017, particularly 2013–2017.[84]
- The use of SRS for forestry and land-use projects is likely to increase in the future; and satellite images (e.g. Landsat TM, Aster and ETM satellite data) could play a key role in monitoring progress on targets to increase forest cover and monitor changes.
- The land area covered by freely available very high-resolution (VHR) imagery has grown dramatically over recent years, which has considerable relevance for forest observation and monitoring.
- For the estimation of forest biomass for REDD+ reporting, SRS data are less accurate at present but new developments in technology, e.g. accurate satellite-based lidar, could improve its prospects.

The National Forest Policy 2020 includes a goal for establishing a remote sensing unit within the Ministry of Forestry and Research to build and maintain a spatial forest cover database to support analytical decisions for integrated landscape planning.

Other data and research gaps include a lack of assessment of the effects of climate change on the forestry sector in Solomon Islands. Based on international research, the forestry sector is at risk due to climate risks, including extreme weather events, changing rainfall patterns, higher mean temperatures and increased fire weather resulting in damage and stresses to species and forest ecosystems. This could result in changes to forest ecosystems, including the density and distribution of species, and also the ability of fo rests to sequester carbon emissions.

84 Government of Solomon Islands (2019), State of the Environment Report 2019.

5.4 Solid waste

5.4.1 Profile

MECDM is responsible for regulatory and policy issues relating to solid waste management in Solomon Islands.[85] Honiara City Council, through its Environmental Health Division, manages the collection and disposal of waste in Honiara, while in other urban centres the Provincial Environmental Health Divisions collect, dispose of waste and manage waste disposal at landfill sites.

The National Waste Management and Pollution Control Strategy (NWMPCS) 2017–2026 outlines the challenges the country is facing in terms of waste management and highlights strategies to deal with the issues. Some of the key challenges in the waste sector include lack of land for landfill, unsuitable waste receptacles, lack of waste segregation and recycling, inadequate waste collection, lack of data and insufficient monitoring and evaluation, and inadequate legislation, policies, regulation and institutions.[86]

A waste characterisation study undertaken for Honiara in 2011 by Honiara City Council showed that the rate of waste generated by the household sector was 0.86 kilograms per person per day, generating as much as 20,278 tonnes. This study shows that the largest component of the waste is organic waste.[87]

Waste management systems are at risk due to climate change hazards, including heavy rainfall, flooding, sea-level rise and erosion. Landfills and contaminated sites can contaminate receiving environments, including coastal ecosystems and water supplies, which can result in negative impacts on sensitive ecosystems, public health, and economic sectors such as tourism.[88] A key target in the National Adaptation Programme of Action (NAPA) is to address waste management issues through an integrated and sustainable approach, which includes improving understanding of at-risk waste sites.[89]

85 Government of Solomon Islands (2017), National Waste Management and Pollution Control Strategy and Implementation Plan 2017–2026.
86 Ibid.
87 Ibid.
88 Brand, J, K Spencer, F O'Shea and J Lindsay (2018), Potential pollution risks of historic landfills on low-lying coasts and estuaries, WIREs Water 5: e1264.
89 Government of Solomon Islands (2008), Solomon Islands National Adaptation Programmes of Action.

The waste sector is a major source of emissions for Solomon Islands and, in 2010, solid waste disposal on land accounted for 23.3 per cent of the country's total GHG emissions. If waste emissions from agriculture and wastewater handling are included, the total emissions in 2010 from the waste sector was 43 per cent – actions to reduce emissions in the agricultural and wastewater sectors are described in food security (section 5.8) and water supply (section 5.9) and sanitation sections of this report).[90] The Second National Communication notes that emissions from the waste sector were not well assessed due to limited data, and waste sector emissions will to be better addressed in the next national communication.[91]

Poor practices which include open burning, open disposal of decomposable solid and liquid waste and the overall poor state of waste management in the capital and provinces all contribute to GHG emissions. Efforts to collect methane gas from rubbish dump sites and convert wastes into useful renewable energy technologies are still lacking.[92]

The implementation of waste projects in Solomon Islands will have co-benefits in addition to GHG emissions reduction, which include:

- achieving broader environmental objectives, such as preventing pollution, mitigating odours, preserving open space and maintaining air, soil and water quality;[93] and
- increase in jobs connected with recycling, although absolute increases in job numbers are expected to be small.

Table 5.11 Status of climate finance projects in the waste sector[94]

Financing priorities	Reducing solid waste emissions, strengthening climate resilience of waste systems.
Financing status	Limited progress: Additional assistance needed, particularly for mitigation projects.

Table 5.12 Actions in the solid waste sector[95]

Action	NWMPCS 2017–2026
Strengthen the capacity of ECD and CCD to carry out monitoring, collection and archiving of waste and pollution data related to climate change.	✓
Climate Change Division (CCD) to develop guidelines and standards for GHG emissions for the respective sectors, e.g. transport and manufacturing.	✓
Enforce penalties for non-compliance to GHG emission requirements where appropriate.	✓
Develop technologies and infrastructures to minimise GHGs, including conversion of waste into useful products; and capture and use of gases (i.e. methane) through innovative sustainable technology.	✓
Encourage extensive sustainable farming practices through the use of organic waste.	✓
Encourage renewable technology relevant to solid and liquid waste.	✓
Establish a national level mechanism to collect and recover waste solar panels, batteries and other renewable energy technology, to prevent these materials becoming waste and pollution into the environment throughout the country.	✓
Promote ecosystem-based adaptation approach to strengthen community and natural resources resilience to climate change impacts.	✓
Formulate guidelines, review regulations, and enforce implementation of waste management actions.	✓

90 Government of Solomon Islands (2017), Solomon Islands Second National Communication.
91 Ibid.
92 Government of Solomon Islands (2017), National Waste Management and Pollution Control Strategy and Implementation Plan 2017–2026.
93 Bogner, J, M Abdelrafie Ahmed, C Diaz, A Faaij, Q Gao, S Hashimoto, K Mareckova, R Pipatti and T Zhang (2007), 'Waste Management', in Metz, B, OR Davidson, PR Bosch, R Dave, LA Meyer (Eds), *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, available at: https://www.ipcc.ch/report/ar4/wg3/
94 *Author's own analysis.*
95 Ibid.

Table 5.13 Key sources of climate financing for the waste sector[96]

Financing instruments	Grants, concessional loans
Financing sources	Key sources of climate finance could include EU/SPREP (Pacwaste Plus), ADB, World Bank, and bilateral donors (e.g. JICA).

5.4.2 Access to climate finance

There have been three climate change projects in the solid waste sector, which presents a key gap. These projects are listed in Appendix A. The World Bank (WB) funded Community Access and Urban Services Enhancement Project includes a waste component, and this is the only project identified for the 2016–18 period that focused on the solid waste sector. Table 5.11 provides an overview of the status of climate finance projects in the solid waste sector.

Key options for reducing waste sector emissions and building resilience are shown in Table 5.12. These are aligned to NWMPCS 2017–2026 and SI NIIP.

In addition, Table 5.13 details the key sources of financing for the waste sector in Solomon Islands.

5.4.3 Potential data utilisation and application

In 2018, a solid waste audit was undertaken for Solomon Islands which outlines the type of waste and estimated volumes of waste disposed.[97] There are considerable data gaps, and there remains a need to better understand the sources of solid waste sector emissions. In addition, it is recommended that the pipeline of prioritised and costed actions, aligned to the NWMPCS 2017–2026, should be developed.

Emissions from the waste sector were not well assessed in the Second National Communication due to limited data, and improving the assessment of GHG emissions in the waste sector will require strengthened data collection.

96 Ibid.

97 PRIF (2019), *Waste Audit Methodology. A step-by-step manual to conduct comprehensive waste audits in SIDs*, available at: https://www.sprep.org/sites/default/files/documents/tenders/Waste_Audit_Methodology.pdf

While it is possible to calculate methane emissions from landfills using SRS data, this technology is nascent, highly technical and not widely used.[98] In the future, it may be cost effective to use SRS data for determining the highest emitting waste sources, waste disposal patterns and level of plastic pollution in the ocean. The data could then be used for allocating climate finance and evaluating progress in reducing waste emissions.

5.5 Biodiversity and the natural environment

5.5.1 Profile

The terrestrial fauna and flora of all the larger islands in Solomon Islands are renowned for high species diversity and levels of endemism. The terrestrial biomes of Solomon Islands are diverse and comprise tropical rainforests, mountains, and volcanic islands.[99]

Solomon Islands coastal and marine environments boast the second highest coral biodiversity in the world and are a part of the Coral Triangle, a scientifically defined area of high species richness.[100] The coastal biodiversity consists of coral reefs, mangroves, intertidal zones, estuaries, seagrass, algae, littoral vegetation and estuaries. Solomon Islands is also rich in sea life, with fish fauna in the country standing at an estimated 1,019 species.[101]

Communities are particularly reliant on coastal and marine ecosystems for inshore fisheries, sources of wood and other goods. The value of Solomon Islands' coastal and marine ecosystem services is considerable and it has been estimated that the annual benefits from coral reefs could equal US$75-170 thousand per square kilometre[102] while the

98 Delkash, M, B Zhou and R Singh (2016), 'Measuring Landfill Methane Emissions using Satellite and Ground Data', Chapman University, available at: https://core.ac.uk/download/pdf/215750693.pdf

99 Government of Solomon Islands (2016), The National Biodiversity Strategic Action Plan 2016–2020.

100 Government of Solomon Islands (2016), *Biodiversity and Ecosystems Management*, available at: http://www.mecdm.gov.sb/environment/biodiversity-ecosystems.html

101 Government of Solomon Islands (2014), *5th National Report on the Implementation of the Convention of Biological Diversity.*

102 Albert, JA, A Trinidad, D Boso, and AJ Schwarz (2012), Coral reef economic valuation and incentives for coral farming in Solomon Islands. Policy Brief. CGIAR Research Program on Aquatic Agricultural Systems, Penang, Malaysia, AAS- 2012-14.

benefits from annual mangrove subsistence have been estimated in the range of $345-1,501 per household.[103]

The biodiversity of Solomon Islands ecosystems are under increasing pressures from climate change hazards and other impacts including land-use change, over-exploitation and invasive species. Key climate change risks could include reduced availability of fresh water, saltwater inundation and intrusion of coastal land and groundwater, and increased incidence of pests and diseases in animals, crops and trees.[104] Climate change is also likely to result in increased acidification of oceans and warmer water temperatures, which could impact reefs and mangroves and reduce fisheries' productivity. Coral reef ecosystems are particularly at risk due to cyclones and heat stress, which can result in coral bleaching, and can take 15 to 25 years to recover from mass mortality events. The risks to ecosystems and ecosystem services could also result in impacts on the provision of ecosystem services.[105]

NBSAP 2016–2020 aligns to and builds on environmental laws and policies, including the NDS. NBSAP 2016–2020 includes a number of climate change related targets and actions: (i) 50 per cent of the biodiversity management intervention priority areas in the NAPA and the climate change policy being under effective implementation; and (ii) the development and adoption of an action plan that is integrated with infrastructure development and disaster risk management.[106]

The implementation of biodiversity and natural environment projects in Solomon Islands will have a number of co-benefits, listed below.

- Restored natural shorelines with mangroves and coral reefs can form a buffer against storm surges and create nurseries for fisheries.
- Protecting groundwater recharge zones and restoring catchments can secure water resources so that entire communities can cope with drought.
- Maintaining ecosystems can also reduce the exposure of assets and systems, such as road networks and agricultural production, to climate hazards including flooding and erosion.

5.5.2 Access to climate finance

In recent years, Solomon Islands has successfully accessed climate finance through a number of projects focused on strengthening ecosystems and ecosystem services, including the following initiatives:

- The Regional Pacific Ecosystem-based Adaptation to Climate Change project has built capacity for developing and implementing ecosystem-based adaptation (EbA) approaches and undertaken studies on mapping EbA, prioritising options and implementing demonstration projects (funded by International Climate Initiative - IKI).[107]
- Ridge-to-reef (R2R) is a regional project focused on mainstreaming of R2R climate resilient approaches to integrated land, water, forest and coastal management in Pacific island countries through strategic planning, capacity building and piloted local actions to sustain livelihoods and preserve ecosystem services (funded by GEF/UNDP).[108]

Approximately 17 projects have been funded by climate finance between 2016 and 2018 to address issues in the ecosystem and ecosystem services sector. These projects are listed in Appendix A. Table 5.14 provides an overview of the status of climate finance projects in the ecosystem and ecosystem services sector.

103 Warren-Rhodes, K, A-M Schwarz, NL Boyle, J Albert, SS Agalo, R Warren, A Bana, C Paul, R Kodosiku, W Bosma, D Yee, P Ronnback, B Crona and N Duke (2011), 'Mangrove ecosystem services and the potential for carbon revenue in Solomon Islands', *Environ Conserv*.

104 Government of Solomon Islands (2016), Solomon Islands National Biodiversity Strategic Action Plan 2016–2020.

105 Heron et al. (2017), Impacts of Climate Change on World Heritage Coral Reefs : A First Global Scientific Assessment, Paris, UNESCO World Heritage Centre.

106 Government of Solomon Islands (2016), Solomon Islands National Biodiversity Strategic Action Plan 2016–2020.

107 SPREP, 'About PEBACC', available at: https://www.sprep.org/pebacc

108 GEF (2013), R2R: Testing the Integration of Water, Land, Forest & Coastal Management to Preserve Ecosystem Services, Store Carbon, Improve Climate Resilience and Sustain Livelihoods in Pacific Island Countries', available at: https://www.thegef.org/project/r2r-testing-integration-water-land-forest-coastal-management-preserve-ecosystem-services

Table 5.14 Status of climate finance projects in the ecosystem and ecosystem services sector[109]

Financing priorities	Building climate resilience of ecosystems, scaling up of demonstration projects, undertaking further research to inform response.
Financing status (adaptation)	Limited information – NBSAP 2016–2020 prioritises actions focused on building climate resilience.

Table 5.15 Actions in the biodiversity and the natural environment thematic area[110]

Action	NBSAP 2016–2020
Manage the impacts of, and enhancing social and ecological resilience to climate change and sea-level rise within the scope of agriculture and food security, water supply and sanitation, human settlements, human health and education.	✓
Enhance and continue to implement strategy for climate change adaptation on low-lying and artificially built-up islands and factored biodiversity themes into the implementing activities.	✓
Protect inland water biodiversity from the adverse effects of development and climate change.	✓
Enhancing of the resilience and the adaptive capacity of coastal communities and socioeco-nomic activities.	✓
Enhance and improve the understanding of the effects of climate change and climate variabil-ity including El Nino-Southern Oscillation on the inshore and tuna fishery resources.	✓
Improving the resilience capacities of key natural infrastructures to climate change and sea-level rise in urban areas.	✓
Integrating of climate change adaptation strategies and measures into tourism planning and development while considering environment safeguard theme in planning.	✓
Ensure urban development has adequately conducted environment impact assessment and has addressed risks associated with climate change and natural disasters.	

Table 5.16 Key sources of climate financing for the ecosystem and ecosystem services sector[111]

Financing instruments	Grants
Financing sources	Key sources of climate finance could include GCF, GEF, AF, UNDP, FAO, SPREP, SPC, NGOs (e.g. Conservation International and IUCN), and bilateral donors (e.g. EU, Government of France, Government of Germany).

While Solomon Islands has implemented a number of successful projects related to ecosystems and ecosystem services, further assistance is required. Future priorities could include the actions listed in Table 5.15 (these are aligned with NBSAP 2016–2020).

In addition, Table 5.16 details the key sources of financing for the ecosystem and ecosystem services sector in Solomon Islands.

109 *Author's own analysis.*
110 Ibid.
111 Ibid.

5.5.3 Potential data utilisation and application

SRS data can also be useful for monitoring and promoting the protection of ecosystems and biodiversity from climate change impacts. EO data are expected to represent one of the most cost-effective ways to identify ecosystems and biodiversity at risk from changes in climatic conditions.[112]SRS data can be used to monitor

112 Luque, S, N Pettorelli, P Vihervaara and M Wegmann (2018), 'Improving biodiversity monitoring using satellite remote sensing to provide solutions towards the 2020 conservation targets', available at: https://besjournals.onlinelibrary.wiley.com/doi/10.1111/2041-210X.13057

the impact of climate change on particular types of ecosystems, such as forest and riparian ecosystems, through data such as habitat quality, vegetarian indices and estimation of evapotranspiration.[113]EO data can be used to identify where the most critical changes are taking place, thereby highlighting the biggest threats to ecosystems and biodiversity. This can act as an early warning system and inform where interventions should be focused.[114]

The ecosystem and socioeconomic resilience analysis and mapping (ESRAM) study, which was undertaken through the Pacific Ecosystem-based Adaptation to Climate Change (PEBACC) project, provides a baseline of the state of ecosystems and ecosystem services.

Additional research and data collection is required to strengthen understanding of ecosystems and ecosystem services in Solomon Islands and the potential risks posed by climate change. This aligns with priority action four in NBSAP 2016–2020, which outlines the need to strengthen research, traditional knowledge and knowledge sharing.[115]

5.6 Livelihoods and disaster risk reduction

5.6.1 Profile

Solomon Islands is at a high risk from climate change hazards, including droughts, flooding, landslides and cyclones. In 2019, Solomon Islands was rated the country fourth most at risk from natural disasters in the World Risk Index report.[116]

Over the past decade, there have been major disasters triggered by climate change hazards, causing loss of life and resulting in severe impacts on the economy. The April 2014 floods devastated the Greater Honiara Area, leading to loss of life of 23 people and resulting in economic damage and losses equivalent to 9.2 per cent of GDP. This event demonstrated the importance of investing in disaster risk reduction and the building of climate resilient livelihoods.[117]

Disasters can impact livelihoods and the wellbeing of communities, and can threaten the survival of sociocultural systems. The displacement of communities, both temporary and permanent, can result in serious impacts on the security, health and wellbeing of individuals. Both slow-onset disasters (e.g. environmental degradation and sea-level rise) and sudden-onset disasters (e.g. cyclones and floods) can result in livelihood impacts and community displacement. Displacement often has multiple causes, including climate change hazards, environmental and socioeconomic drivers (e.g. population), and policy and regulatory challenges (e.g. inadequate urban planning). Climate change is expected to result in domestic migration and relocation within Solomon Islands – migrants from high-risk areas may move to peri-urban informal settlements, which are also often located in hazard-prone areas.[118]

The majority of livelihoods in Solomon Islands are dependent on agriculture and fisheries, and both sectors are at risk from climate change. Over 80 per cent of Solomon Islanders live in rural areas and most rural households derive their livelihoods from subsistence agriculture and small-scale income-generating activities.[119] Building climate change resilience in the agricultural sector and associated infrastructure can result in more resilient communities that have increased capacity to recover from disasters.[120] The forestry and mining sectors are also at risk due to climate change, and were impacted in the April 2014 flooding.[121] This demonstrates the importance of investing in resilience and diversification to reduce the impacts of shocks and disasters.

For a community to be resilient, it needs to know what risks and hazards it is exposed to and develop response plans to those risks and hazards. Resilient communities are those that can adapt, respond and

113 World Bank (2019), Global Water Security and Sanitation Partnership: New avenues for remote sensing applications for water management, available at: https://documents1.worldbank.org/curated/en/810581561961939655/pdf/New-Avenues-for-Remote-Sensing-Applications-for-Water-Management-A-Range-of-Applications-and-the-Lessons-Learned-from-Implementation.pdf

114 Anderson, C (2018), 'Biodiversity monitoring, earth observations and the ecology of scale', *Journal of Ecology Letters*, Vol 21 No 10.

115 Government of Solomon Islands (2016), The National Biodiversity Strategic Action Plan 2016–2020.

116 Bündnis Entwicklung Hilft (2019), WorldRiskReport 2019.

117 Government of Solomon Islands (2014), Rapid Assessment of the Macro and Sectoral Impacts of Flash Floods in Solomon Islands, April 2014.

118 Government of Solomon Islands (2017), Solomon Islands Second National Communication.

119 Ibid.

120 Government of Solomon Islands (2014), Rapid Assessment of the Macro and Sectoral Impacts of Flash Floods in Solomon Islands, April 2014.

121 Ibid.

be quick to recover so that they are environmentally, socially and economically sustainable. Solomon Islands requires strong institutions and governance to reduce and manage the risks posed by disasters. NDMP 2018 outlines a number of actions and initiatives to strengthen disaster risk reduction planning, mobilise resources, build institutional capacity, and improve co-ordination between stakeholders.[122]

The implementation of projects that safeguard livelihoods and achieve disaster risk reduction will have wide-ranging benefits, which include:

- Reducing losses of lives and property and minimising environmental damage through expanding the coverage of early warning systems (EWS). Investing in EWS can also result in benefits to the private sector – firms involved in agriculture, power production, aviation, and mining all have a large interest in being warned about weather phenomena such as strong wind or lightning, and to maintain regular water flow.[123]
- Interventions in other sectors that reduce the exposure of people, households, buildings and assets to climate hazards may result in wide ranging co-benefits. For example, afforestation of land may reduce risks from flood and landslides, and this will also have benefits from GHG emissions reductions and the potential of harvesting NTFPs.
- Actions across all sectors should be articulated to benefit the community and livelihoods regardless of how climate change materialises. This is referred to as a 'low regret' intervention, suggesting that there are few or no regrets in implementing an intervention in the future, which will still be beneficial despite climate change and its future implications.

5.6.2 Access to climate finance

A large quantum of climate finance has been allocated towards building resilient communities and reducing disaster risk in Solomon Islands. The country has successfully accessed climate change finance for strengthening disaster risk reduction (DRR) outcomes from a range of sources. This includes the following projects:

- Community Resilience to Climate and Disaster Risk in Solomon Islands project (funded by GEF) increases the capacity of selected rural communities to manage natural hazards and climate change risks.[124]
- Enhancing urban resilience to climate change impacts and natural disasters project has a particular focus on pro-poor adaptation actions that involve and benefit the most vulnerable communities (funded by the Adaptation Fund).[125]
- Pacific Risk Resilience Program (funded by the Government of Australia) is multi-country disaster risk management programme.
- Humanitarian support, including for reconstruction and rehabilitation following natural disasters such as the April 2014 floods.

An estimated 11 projects have been funded by climate finance between 2016 and 2018 to address issues in the livelihoods and disaster risk reduction sector. These projects are listed in Appendix A. Table 5.17 provides an overview of the status of climate finance projects in the livelihoods and disaster risk reduction sector.

Table 5.17 Status of climate finance projects in the livelihoods and disaster risk reduction sector[126]

Financing priorities	Strengthened early warning systems, improved evacuation centres and routes, strengthened institutional frameworks, and increased support to building climate resilient livelihoods.
Financing status	Satisfactory progress: Climate finance projects are aligned with the NDSP 2016–2035 and NDMP 2018.

122 Government of Solomon Islands (2018), National Disaster Management Plan 2018.

123 International Federation of Red Cross and Red Crescent Societies (2013), A guide to mainstreaming disaster risk reduction and climate change adaptation.

124 GEF (2014), Community Resilience to Climate and Disaster Risk in Solomon Islands Project, available at: https://www.thegef.org/project/community-resilience-climate-and-disaster-risk-solomon-islands-project

125 Adaptation Fund, Enhancing urban resilience to climate change impacts and natural disasters: Honiara, available at: https://www.adaptation-fund.org/project/enhancing-urban-resilience-climate-change-impacts-natural-disasters-honiara-3/

126 *Author's own analysis.*

Table 5.18 Actions in the livelihoods and disaster risk reduction thematic area[127]

Action	NDMP 2018
Strengthen and establish early warning systems for climate hazards, such as floods and tropical cyclones.	✓
Upgrade evacuation centres and evacuation routes, particularly in Honiara, to safeguard livelihoods from natural disasters.	✓
Develop a programme for allocating safe, suitable and available land for displaced populations in need, including climate migrants.	✓
Develop affordable climate/disaster resilient housing designs.	✓
Strengthen efforts to build climate resilient livelihoods in vulnerable populations. This should have a focus on agricultural and fisheries activities, and should be a part of recovery and rehabilitation activities.	✓
Strengthen institutional frameworks, capacity and co-ordination.	✓

Table 5.19 Key sources of climate financing for the livelihoods and disaster risk reduction sector[128]

Financing instruments	Grants
Financing sources	Key sources of climate finance could include GCF, GEF, AF, CIF, UNDP, World Bank, ADB and bilateral donors (e.g. DFAT and MFAT).

Further assistance is required to strengthen livelihood resilience and build disaster risk reduction. This could include the actions outlined in Table 5.18.

Table 5.19 details the key sources of financing for the livelihoods and disaster risk reduction sector in Solomon Islands.

5.6.3 Potential data utilisation and application

SRS data can be further utilised to forecast climate hazards, particularly in relation to flooding, extreme events (such as tropical storms and cyclones) and drought. These data can be used to provide early warnings to households, farmers and other stakeholders. The provision of early warnings is beneficial due to reduction in damage and negative impacts (including loss of life) associated with climate change induced disasters. SRS data can also support the identification of evacuation routes for communities and evaluate roads and key facilities to confirm their usability post disaster.[129]

SRS data can support precise post-disaster needs assessments and evaluation of early and long-term recovery needs and priorities. This including the allocation of humanitarian assistance following a disaster through identifying the most at need communities and prioritising infrastructure repair.

Rapid damage mapping tools were deployed to understand the New Year flood 2018 in Honiara to understand impacts and possible damage using GIS and remote sensing (RS) data.[130] The government acknowledged the use of GIS and SRS in disaster responses and fully fledged support unit under MECDM. EO data are also used to generate hazard mapping for coastal inundation, river floods and erosion protections in Solomon Islands.

Another application is the use of SRS data for index-based drought or flood insurance, where insurance premiums and payouts are based on a pre-determined index derived from EO data rather than on actual crop and livestock losses. Index insurance is used as a risk management tool in agriculture, food security and disaster risk reduction and helps stabilise income for smallholders when yields are affected by weather.[104]

127 Ibid.
128 Ibid.

129 European Space Agency (2019), *Final Report on Earth Observation for Sustainable Development in Agriculture and Rural Development*, EO4SD Agriculture and Rural Development cluster.
130 Committee on Data (no date), 'China GEO-CODATA LODGD supports New Year Flood Impact in Honiara, available at: https://codata.org/china-geo-codata-lodgd-supports-new-year-flood-impact-in-honiara/

5.7 Resilient infrastructure

5.7.1 Profile

Despite recent progress in planning and policy to build resilience, including through the adoption of SI NIIP 2013, translating national climate resilience into infrastructure development remains a significant challenge. Urban centres of Solomon Islands are particularly vulnerable to climate change hazards and natural disasters, and inadequate infrastructure contributes to a range of adverse impacts.

Providing services and building infrastructure in Solomon Islands is challenging due to the remoteness of islands, rugged terrain, and access to basic utilities. Infrastructure is potentially at high risk from a range of climate change hazards, including extreme events (e.g. cyclones and heavy rainfall), sea-level rise, inland and coastal flooding, landslides and coastal erosion. The April 2014 floods, for instance, resulted in substantial loss of life, infrastructure damage and economic losses. In the Greater Honiara area, the flooding destroyed 235 houses along the valley, washed away the Old Mataniko Bridge and inundated classrooms at Honiara High School.[131]

Particularly vulnerable to climate-induced impacts are coastal areas where the majority of the country's population reside and a large share of infrastructure is located. Coastal infrastructure is increasingly at risk due to coastal erosion and storm surges, which are both intensified and caused by climate hazards including cyclones and sea-level rise.[132]

There is a need to integrate climate resilience measures into key infrastructure (including housing and the urban built environment). Resilience is the ability to prepare and plan for, and for infrastructure to absorb and recover from and successfully adapt to, adverse events – often more simply put as the ability to 'bounce back'.

SI NIIP sets out the strategy for infrastructure investment in the country and is closely aligned to the NDS. The preparation of SI NIIP involved consideration of the means by which climate change/resilience planning can be integrated into infrastructure plans and projects.[133] SI NIIP, moreover, involved a high-level climate and natural disaster risk assessment and prioritised the following projects that were deemed as most susceptible to climate change and natural hazards:

- Henderson Airport Apron upgrade;
- Provincial Airfields upgrade;
- Malaita North Road;
- Honiara urban development;
- provincial sanitary landfills;
- Water Supply 2 Year Plan and WASH projects;
- 2013 replacement wharves; and
- New Wharves Tranche 2.

The development of resilient infrastructure in Solomon Islands will result in a number of co-benefits, which include:

- Increased reliability of service provision and infrastructure has benefits ex post, by reducing the frequency and severity of disruption. It also has benefits ex ante, as it reduces the need for users to invest in backup measures.[134]
- Adaptations can produce development benefits in urban areas including safer, healthier and more comfortable urban homes and environments, and reduced vulnerability for low-income groups to disruptions in their incomes and livelihoods.[135]

5.7.2 Access to climate finance

Solomon Islands has successfully accessed climate change finance from a range of sources for multi-sector climate resilient infrastructure projects. This includes the following projects:

- Enhancing urban resilience to climate change impacts and natural disasters project builds the resilience of Honiara and its inhabitants with a particular focus on pro-poor adaptation

131 Government of Solomon Islands (2014), Rapid Assessment of the Macro and Sectoral Impacts of Flash Floods in Solomon Islands, April 2014.

132 Government of Solomon Islands (2017), Solomon Islands Second National Communication.

133 Government of Solomon Islands (2013), Solomon Islands National Infrastructure Investment Plan 2013–2023.

134 OECD (2018), Climate-resilient Infrastructure. OECD Environment Directorate.

135 Revi, A, DE Satterthwaite, F Aragón-Durand, J Corfee-Morlot, RBR Kiunsi, M Pelling, DC Roberts and W Soleck (2014), in Field, CB, VR Barros, DJ Dokken, KJ Mach, MD Mastrandrea, TE Bilir, M Chatterjee, KL Ebi, YO Estrada, RC Genova, B Girma, ES Kissel, AN Levy, S MacCracken, PR Mastrandrea and L White (Eds), *Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 535–612.

actions that involve and benefit the most vulnerable communities (financed by the Adaptation Fund).[136]

- Community Access and Urban Services Enhancement project aims to improve basic infrastructure and services for vulnerable urban populations in urban centres (financed by the World Bank).[137]
- Bilateral projects include support on urban planning and climate change (financed by KOICA).

Approximately two projects have been funded by climate finance between 2016 and 2018 to address issues in the resilient infrastructure sector. These projects are listed in Appendix A. Table 5.20 provides an overview of the status of climate finance projects in achieving resilient infrastructure.

Further assistance is required to develop climate resilient infrastructure, which could include the actions listed in Table 5.21.

Other actions to build resilient infrastructure could include:

- develop climate resilient buildings, including affordable disaster resilient housing;
- coastal defences for buildings, assets and infrastructure in areas at risk of sea-level rise and coastal flooding;
- hazard mapping and national land-use planning;
- adopt and enforce a building code which includes climate resilience measures; and
- develop financial mechanisms to protect infrastructure from climate change risks, such as affordable micro-insurance and 'climate insurance' models.

In addition, Table 5.22 details the key sources of financing for developing climate resilient infrastructure.

Table 5.20 Status of climate finance projects related to resilient infrastructure[138]

Financing priorities	SI NIIP projects, climate resilient infrastructure, flood and coastal defences, hazard mapping, strengthened regulation, innovative financing mechanisms.
Financing status	Satisfactory progress: Key projects implemented have been aligned to SI NIIP 2013.

Table 5.21 Actions to achieve climate resilient infrastructure[139]

Action	SI NIIP 2013
Urban development of Honiara, including the provision of climate resilient urban infrastructure services.	✓
Urban development of economic growth centres, including the development of climate resilient information and communications technology (ICT), waste services, energy systems and civil works.	✓
Development of infrastructure master plans for provinces to build climate change resilience and develop integrated infrastructure provision.	✓
Development of industrial parks, which could be comprised of climate resilient infrastructure and focused on providing low-carbon industries.	✓

Table 5.22 Key sources of climate financing related to resilient infrastructure[140]

Financing instruments	Grants, concessional loans
Financing sources	Key sources of climate finance could include GCF, GEF, AF, CIF, UNDP, World Bank, ADB and bilateral donors (e.g. DFAT, MFAT, KOICA and JICA).

136 Adaptation Fund, Enhancing urban resilience to climate change impacts and natural disasters: Honiara, available at: https://www.adaptation-fund.org/project/enhancing-urban-resilience-climate-change-impacts-natural-disasters-honiara-3/

137 World Bank (2018), Solomon Islands – Community Access and Urban Services Enhancement Project, available at: https://www.worldbank.org/en/news/loans-credits/2018/04/02/solomon-islands-community-access-and-urban-services-enhancement-project

138 *Author's own analysis.*

139 Ibid.

140 Ibid.

5.7.3 Potential data utilisation and application

EO data can measure changes in deformation of buildings and infrastructure, with applications for geophysical monitoring of subsidence and structural stability. The Ministry of Infrastructure has a well-developed asset database which uses SRS data to understand and monitor the condition of assets. Another potential use is determining the area of impervious surfaces, which is related to the risk of urban floods, the urban heat island phenomenon as well as the reduction of ecological productivity.

EO data can provide an improved understanding of the built environment, including urbanisation and settlement trends, population changes and changing infrastructure and transport needs. The data can provide information on the spatial location of buildings and infrastructure in urban and peri-urban areas, and the impact of heavy rainfall and sea-level rise and associated inland and coastal flooding and landslides on these assets.[141]

The data can then be used to inform planning strategies, enabling authorities to properly prepare for natural hazards and undertake decision-making on allocation of climate finance to build infrastructure resilience and initiate prevention measures.

5.8 Food security and nutrition

5.8.1 Profile

The agricultural sector is a key sector of the economy in Solomon Islands, accounting for approximately 16 per cent of GDP.[142] About 80 per cent of Solomon Islands population is dependent on agriculture, livestock and fisheries for their daily livelihoods, food and social security. Solomon Islands relies on a narrow range of primary agriculture export commodities (palm oil, cocoa, copra and coconut oil) with limited diversification, and is therefore significantly vulnerable to climatological, natural hazard and trade impacts.[143]

The agriculture sector continues to face a number of challenges, including the impact of climate change, the limited availability of suitable agricultural land, the depletion of soil fertility due to intensive land use for logging and mining, high internal transport costs, inadequate infrastructure, insufficient or insecure land tenure for small landholders, and limited access to finance and other agricultural support services.

Climate change threatens agricultural production and food security, including subsistence agriculture and key agricultural exports. Agricultural activities are particularly susceptible to droughts, extreme weather events and changes in rainfall, and associated floods, reductions in freshwater availability and wind damage. Agricultural systems are also at risk due to temperature stresses and associated increases in evapotranspiration. For example, heavy rainfall and floods can damage seedlings and encourage conditions that promote diseases and pests. Droughts and temperature increases, moreover, can add thermal stresses to crops and livestock. There are likely to be water stresses from saltwater inundation and soil salinisation in coastal areas, and water shortages due to droughts and decreased flows.

Warming seas and ocean chemistry changes threaten the fishing industry and exports. Coral reefs and inshore fisheries are at risk from ocean acidification and warmer marine temperatures may result in altered migratory patterns of tuna, fisheries being a key industry in Solomon Islands.[144]

The agricultural sector is a major source of GHG emissions, particularly from animal waste. In 2010, it was estimated that agricultural sector emissions contributed approximately 12.4 per cent of total GHG emissions in Solomon Islands.[145]

With the risk and emissions profile of the agriculture sector, key responses are needed from agricultural producers, communities and government agencies. This could include the use of renewable energy and energy efficient technologies, including solar water irrigation systems and solar dryers, and the promotion of climate resilient crops and agroforestry initiatives to achieve resilience and mitigation outcomes, including carbon

141 World Bank and OECD (2019), World Bank national accounts data, and OECD National Accounts data files, World Bank.
142 Government of Solomon Islands (2015), Solomon Islands Agriculture and Livestock Sector Policy 2015–2019.
143 Government of Solomon Islands (2017), Second National Communication.
144 COP23 Fiji, Solomon Islands, available at: https://cop23.com.fj/solomonislands/
145 Government of Solomon Islands (2017), Second National Communication.

sequestration, improving soil quality and achieving erosion control.[146]

Solomon Islands Agriculture and Livestock Sector Policy (SIALSP) 2015–2019 outlines the vision for achieving food sovereignty and economic stability, and strengthening trade and improving rural livelihoods. SIALSP 2015–2019 is aligned to the NDS and outlines the actions for the Ministry of Agriculture to undertake over the period of the strategy. Moreover, a key objective of the strategy is to reduce the impact of climate change, disaster and environmental risks on the agricultural sector.

Specifically, the Policy aims to provide a framework to align agricultural production with the developmental needs of Solomon Islanders. Solomon Islands has one of world's highest population growth rates at 3.6 per cent and is now experiencing land shortage due to high population pressure on available land for food production, while also facing the challenges of the adverse impacts of extractive industries and climate change. This policy aims to support Solomon Islands in becoming more resilient to adverse impacts by guiding and directing resources to the agricultural sector.

The implementation of food security and nutrition projects in Solomon Islands will result in a number of co-benefits, which include:

- Diversification of the food system, which can reduce risks from climate change, could generate significant health co-benefits from reduced dependence on imported processed food.[147]
- Many livestock related options can enhance the adaptive capacity of rural communities, in particular of smallholders. Significant synergies exist between adaptation and mitigation, for example through sustainable land management approaches.[148]
- Changes to land use and agricultural management can also affect biodiversity both positively and negatively depending on farming practice – for example, agroforestry could favour biodiversity while intensified monoculture farming may lead to a loss of biodiversity.[149]
- Lastly, empowering women can bring synergies and co-benefits to household food security and sustainable land management.[150]

5.8.2 Access to climate finance

Climate finance has been successfully utilised to implement a number of projects in the agriculture sector in Solomon Islands. This includes the following projects:

- USAID Climate Change and Food Security Project in Solomon Islands evaluated and implemented innovative techniques and management approaches to increase the climate change resilience of food production systems, and also included training and capacity building components (funded by USAID).
- Pacific Adaptation to Climate Change Project (PACC) involved resilient atoll agriculture, which implemented long-term adaptation measures (funded by GEF-LDCF).
- Strengthening Food Security for Rural Livelihoods in Solomon Islands Program (funded by Government of Australia).

Approximately nine projects have been funded by climate finance between 2016 and 2018 to address issues in the agriculture sector. These projects are listed in Appendix A. Table 5.23 provides an overview of the status of climate finance projects in agriculture sector.

Further assistance is required to strengthen outcomes in the agricultural sector. This could include the actions listed in Table 5.24.

In addition, Table 5.25 details the key sources of financing for the agriculture sector in Solomon Islands.

146 Government of Solomon Islands (2015), Solomon Islands Agriculture and Livestock Sector Policy 2015–2019.

147 IPCC (2019), *Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems*, available at: https://www.ipcc.ch/site/assets/uploads/2019/11/SRCCL-Full-Report-Compiled-191128.pdf

148 Ibid.

149 Smith, P, D Martino, Z Cai, D Gwary, H Janzen, P Kumar, B McCarl, S Ogle, F O'Mara, C Rice, B Scholes and O Sirotenko (2007), 'Agriculture', in Metz, B, OR Davidson, PR Bosch, R Dave, LA Meyer (Eds), *Climate Change 2007: Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, UK and New York, NY, USA.

150 IPCC (2019), *Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems*.

Table 5.23 Status of climate finance projects in the agriculture sector[151]

Financing priorities	Develop climate resilient crops, scale up climate resilient practices, implement community extension models.
Financing status	Satisfactory progress: Recent projects have been aligned to SIALSP 2015–2019, but further support is needed.

Table 5.24 Activities in the agricultural sector[152]

Action	SIALSP 2015–2019
Promote disaster risk management, ensuring the agricultural sector and food security are key focuses of post-disaster recovery and financing. Also, develop crops that are resilient to natural disasters and establish crop insurance schemes.	✓
Promote traditional ways to protect crops from natural hazards and methods to preserve food and seed stocks.	✓
Encourage use of conservation farming techniques such as agroforestry, fallow, cover crops, intercropping and contour planting.	✓
Promote agroforestry with the use of intercropping to reduce vulnerability to natural disaster, soil degradation and erosion and improve farm productivity.	✓
Discourage slash and burn methods that lead to soil and environment degradation.	✓
Mainstream climate change adaptation, disaster risk reduction into national policies, strategies and programmes related to agriculture, forestry and fisheries.	✓
Partner with private sector, NGOs, donor partners (national and international) and other service providers to enhance the productive capacity of the agricultural sector.	✓
Strengthen farmer institutions as well as the research and development capacity to raise productivity of food crops and livestock and of value adding technologies to boost production for both local consumption and export.	✓
Promote and empower women, youth and people with special needs to participate in all agricultural developments and activities.	✓

Table 5.25 Key sources of climate financing for the agriculture sector[153]

Financing instruments	Grants
Financing sources	Key sources of climate finance could include GCF, GEF, AF, CIF, FAO, UNDP, World Bank, ADB and bilateral donors (e.g. MFAT, AFD, USAID).

5.8.3 Potential data utilisation and application

With Earth Observation data, improvements in agricultural sector diagnostics, programme monitoring and service delivery can be achieved. EO services are able to provide data and projections of crops' biophysical, soil and climate characteristics and the occurrence, duration and intensity of natural disasters, such as heat stress, droughts and floods, that strongly influence agricultural production.[154] The efficiency of irrigation can also be assessed, and EO data on evapotranspiration and soil moisture can be used to determine which crops/areas are most in need of irrigation.[155]

151 *Author's own analysis.*
152 Ibid.
153 Ibid.

154 European Space Agency, EO4SD Agriculture and Rural Development Cluster (2019), *Final Report on Earth Observation for Sustainable Development in Agriculture and Rural Development*, available at: https://www.eo4idi.eu/
155 World Bank and OECD (2019), World Bank national accounts data, and OECD National Accounts data files, World Bank.

EO data can support integrated ecosystem management by determining the status of agroecosystems, such as impacts on the flow of ecosystem services to and from agroecosystems. EO data are also able to assess impacts of agriculture of particularly vulnerable ecosystems (such as wetlands), and patterns of deforestation and ecosystem loss and degradation.[123] For areas identified as having a higher susceptibility of land degradation and soil erosion risk, resources can be allocated to support vulnerable farmers.

SRS data also allow comparisons over time, and can provide effective, near real-time and large-scale agricultural monitoring systems. The data can help to assess the impact of project interventions, assisting the final programme or project evaluation, and also predict crop yields.[123] Lastly, EO data can map rural infrastructure assets and physical supply chain infrastructures such as the road network, storage facilities and markets. The data can be used to support planning and design of rural infrastructure investments and estimate future land-use demand.

Solomon Islands applied some innovative approaches recently for seaweed cultivation planning using high-resolution satellite imagery to map near Wagina Islands in the Western Province and increased revenue through exports.[156] These data supported a strategic and inclusive approach to planning for sustainable aquaculture in Solomon Islands and the Pacific region.

5.9 Water supply and sanitation

5.9.1 Profile

Solomon Islands is vulnerable to variable rainfall, droughts and frequent flooding, which can impact water supplies and sanitation. Solomon Islands requires better water supply infrastructure and systems.[157]

With Solomon Islands' highly dispersed and largely rural population, supplying adequate and reliable safe water is a major challenge. Many rural water supplies rely on partnerships with local communities or community organisations such as churches, and current systems are financially unsustainable. In urban areas, the challenge of supplying water to largely unplanned and rapidly growing centres with ageing infrastructure presents major problems. Urban systems have only partial coverage and supply water intermittently. In urban areas of the country, water and sewerage services are provided by the government-owned Solomon Islands Water Authority (SIWA).[158] Without investments in resilience, climate change, coupled with increased urbanisation, could exacerbate water and wastewater challenges in Solomon Islands.

Water supply systems could be vulnerable to drought-induced water shortages and floods, and extreme events could damage water infrastructure (including wastewater systems), which could result in declining water quality and increased water insecurity in at-risk communities. For low-lying areas, atolls and islands, encroaching sea water has resulted in salinisation of water, especially in groundwater sources and freshwater lens, and areas where recharge rates are on the decline – forcing communities to look for other sources of potable water.[159]

Urban and rural sanitation is a major concern with only about 11 per cent of households in the central area of Honiara connected to a reticulated sewerage system and no treatment of wastewater. In rural areas, poorly constructed septic tanks and pit latrines also contaminate the soil and groundwater and overflowing sewage is a significant problem in wet seasons. Some public sanitation systems have also been installed without government approval. Moreover, 80 per cent of rural households and rural schools have no sanitation systems.[160]

Incidence of diarrhoea and water-borne diseases throughout Solomon Islands is unacceptably high and results in health impacts and economic damage. The discharge of wastes and pollution to receiving environments is also a major threat to human health, freshwater environments and ecosystems, and marine environments. One of the most important strategies for providing safe water for human use is to protect water source areas from contamination, misuse and urbanisation, yet there is very limited protection in Solomon Islands.[161]

Wastewater handling is also a source of emissions in Solomon Islands, with emissions estimated at 9.4

156 SINOPSIS (2019), Solomon Islands National Ocean Planning Spatial Information System: Spatial decision support tools for seaweed aquaculture planning in Solomon Islands.
157 Government of Solomon Islands (2017), Second National Communication.
158 Government of Solomon Islands (2017), National Water and Sanitation Implementation Plan 2017–2033.
159 Government of Solomon Islands (2017), Second National Communication.
160 Government of Solomon Islands (2017), National Water and Sanitation Implementation Plan 2017–2033.
161 Ibid.

per cent of total GHG emissions.[162] For pumping water, there is almost total reliance on fossil fuels for electricity generation.

The implementation of water supply and sanitation projects in Solomon Islands would result in a number of co-benefits, which include:

- Developing climate resilient sanitation systems (including wastewater treatment) could result in reduced pollution to receiving environments, improved water quality and economic benefits to fishing, agriculture, and tourism sectors.
- Improving water quality could result in health benefits from eradication of water-borne diseases, which could lead to additional socioeconomic benefits including poverty reduction and productivity gains.
- Lastly, developing climate resilient water supplies proactively could also save costs – as climate hazards could increase the cost of supplying water in the future through water shortages, saltwater incursion and damage to infrastructure.

The intention of the national Water and Sanitation Implementation Plan (WATSAN) 2017–2033 is safe and protected water sources, water supply systems and hydropower systems and well-managed sanitation and waste disposal systems. The Plan is based on the principles of integrated water resource management, managing from ridge to reef and engaging community to Cabinet in the process; water use efficiency; and adaptation to climate and global change. A key policy goal under WATSAN 2017–2033 is to reduce risks due to climate variability, natural disasters and projected impacts of climate change, and incorporate climate change considerations into water and sanitation planning and management. A number of key policy objectives are also related to achieving climate change outcomes, including:

- capacity building and institutional strengthening;
- increased access of safe, reliable, sustainable and cost-effective water supplies to households, communities, and public services;
- increased access households, communities, and public services to sanitation services; and
- use of renewable energy in water-supply and sanitation systems.

5.9.2 Access to climate finance

While GoSI has received significant climate change related support in the water and sanitation sector in recent years, further support is required. GoSI has successfully accessed climate finance via the following projects:

- Solomon Islands Water Sector Adaptation Project (SIWSAP), which focused on improving the resilience of water resources to the impacts of climate change in order to improve health, sanitation and quality of life, and sustain livelihoods in target vulnerable areas (funded by GEF);[163]
- supporting Solomon Islands Water Authority with increasing the access of urban households to clean, reliable and sustainable water and sanitation services (funded by DFAT); and
- capacity building and institutional strengthening, including support on developing the Water Resources Management Plan and Strategy (funded by the Korea International Co-operation Agency) and training of government officials (including a project funded by DFAT).

Approximately 16 projects have been funded by climate finance between 2016 and 2018 to address issues in the water supply and wastewater sector. These projects are listed in Appendix A. Table 5.26 provides an overview of the status of climate finance projects in water supply and wastewater sector.

Further assistance is required to achieve water supply and wastewater goals and targets. The provision of climate finance should be aligned to the policy objectives of the National WATSAN plan 2017–2033 and the priority projects identified in SI NIIP 2013. Climate finance could be allocated to the actions shown in Table 5.27.

In addition, Table 5.28 details the key sources of financing for the water supply and wastewater sector in Solomon Islands.

162 Government of Solomon Islands (2017), Second National Communication.

163 GEF (2012), Solomon Islands Water Sector Adaptation Project (SIWSAP), available at: https://www.thegef.org/project/solomon-islands-water-sector-adaptation-project-siwsap

Table 5.26 Status of climate finance projects in the water supply and wastewater sector[164]

Financing priorities	Increasing access and supply to households and public services of potable water and sanitation, improving infrastructure systems and management, strengthening capacity and improving planning, institutional, regulatory and legislative frameworks.
Financing status (adaptation)	Satisfactory progress: Climate finance projects are aligned with the National WATSAN Plan 2017–2033.

Table 5.27 Actions in the water supply and sanitation sector[165]

Action	WATSAN 2017–2033	SI NIIP 2013
Water supply improvement projects including construction of pipelines, pumps and maintenance work.	✓	✓
Rural WASH projects including rural water and sanitation infrastructure (such as solar driven pumps and rainwater harvesting systems).	✓	✓
Development of water supply plans, including at the provincial level.	✓	✓
Prioritising the access of public services (schools, hospitals and clinics) and households to water supplies and improved sanitation. Rural WASH projects and the Gizo Water Supply are considered priority projects in SI NIIP 2013–2023.	✓	×
Survey of indigenous adaptation strategies in water supply carried out.	✓	×
Pilot projects of trials of adaptation strategies in water supply undertaken in priority areas in Solomon Islands.	✓	×
Public awareness, education and communication programme based on successful pilots developed nationwide.	✓	×
Successful adaptation pilots rolled out nationwide.	✓	×
Mainstream disaster risk reduction into WATSAN planning and management.	✓	×
Water supply and sanitation systems at risk from sea-level rise and storm surge identified.	✓	×
New renewable energy water supply pumping systems installed where practical.	✓	×
Relevant national, local and community agencies adequately resourced, staffed and trained, including on operation and maintenance of water and sanitation systems.	✓	×
Strengthened planning frameworks, institutions, regulations and legislation, including improved incentive structures to protect water sources and increase access.	✓	×

Table 5.28 Key sources of climate financing in the water supply and wastewater sector[166]

Financing instruments	Grants, concessional loans, equity and guarantees
Financing sources	key sources of climate finance could include gcf, gef, adaptation fund, adb, wb, un agencies (e.g. undp), and bilateral donors (e.g. dfat, koica).

164 *Author's own analysis.*
165 Ibid.
166 Ibid.

5.9.3 Potential data utilisation and application

Data utilisation for water and wastewater projects could be strengthened by SRS data. Satellite-based sensors are now capable of making direct and indirect measurements of nearly all components of the hydrological cycle.[167] The modernised layout of the Solomon Water Master Plan for water supply and water intake in Honiara was developed using SRS data. The water supply network and distribution is in the process of upgrade using SRS data.

Furthermore, SRS data can improve hydrometeorological monitoring and prediction, including to monitor the status of water reservoirs/basins, lakes and large rivers, and predicting impacts of droughts on water supplies.[168] Solomon Islands Meteorological Services uses SRS data (i.e. Himawari satellite imagery) for their daily weather forecasts. SRS data could indirectly be used to understand groundwater recharge rates through looking at evapotranspiration in riparian and wetland ecosystems and environments. Water quality changes, which are a risk due to climate change, can be measured based on key parameters, such as vegetation indexes, land-use change observations and algal bloom frequency, which can complement ground measurements.[169] SRS data can also be used to better predict and understand flood risk, and the use of satellite data in forecasting and managing flood risk is covered in more detail in the resilient infrastructure and disaster risk reduction sections of this report.

SRS data could be used for planning and monitoring the effectiveness of wastewater systems, which could include monitoring the receiving environments. For example, SRS can be used for monitoring wastewater discharges into coastal waters, which can support decision-makers with determining which areas/communities require investment in developing and improving wastewater systems.

Additional data are also required to improve water supply and wastewater outcomes. Future climate finance projects could focus on strengthening information management and data collection, including mapping of water resources and identifying catchments and infrastructure at risk; improving information sharing between local water committees, government and private sector providers; and strengthening understanding of community needs.

5.10 Health

5.10.1 Profile

Public health outcomes in Solomon Islands are at particularly high risk due to climate change impacts. The marginalised parts of society, which lack access to health facilities, have a particularly high vulnerability to climate hazards and associated health impacts. Climate change will not necessarily bring new threats to public health in Solomon Islands, but the most likely impact is the exacerbation of the public health problems that currently exist.[170]

Climate change will result in direct physical health impacts (e.g. deaths and injuries) from increasingly severe and frequent cyclones, increases in extreme daily temperatures, and inland and coastal flooding. Climate change will also affect the distribution and prevalence of diseases, including waterborne and vector-borne diseases, and nutritional deficiencies associated with food insecurity. Public health outcomes could also decline through impacts on mental health and the disruptions in the delivery of health services.

Flooding can cause serious health risks; an increase in urban flooding can undermine drinking water quality and cause direct harm to affected people. For example, in the two months following the April 2014 flood in Honiara, there was an increase in diarrhoeal illness in Honiara caused by the contagious rotavirus. There is evidence that this outbreak then spread to other provinces, which

167 Sheffield, J, EF Wood, M Pan, H Beck, G Coccia, A Serrat-Capdevila and K Verbist (no date), 'Satellite remote sensing for water resources management: Potential for supporting sustainable development in data-poor regions', *Water Resources Research*, 54, available at: https://www.frontiersin.org/articles/10.3389/fmars.2017.00329/full

168 Trinh, R, B Holt, B Pan, C Rains and M Gierach (2014), 'Satellite Remote Sensing Detection of Wastewater Plumes in Southern California', American Geophysical Union, Fall Meeting, available at: https://ui.adsabs.harvard.edu/abs/2014AGUFMOS23C1224T/abstract

169 World Bank and OECD (2019), World Bank national accounts data, and OECD National Accounts data files, World Bank.

170 Spickett, JT and D Katscherian (2014), 'Health impacts of climate change in Solomon Islands: an assessment and adaptation action plan', *Global Journal of Health Science*, 6(5), 261–273, available at: https://doi.org/10.5539/gjhs.v6n5p261

resulted in more than 6,000 diarrhoeal cases and 27 diarrhoea-related deaths nationally.[171]

The hospitals and health clinics of Solomon Islands are also at risk due to climate change hazards such as flooding and coastal hazards. Health clinics were damaged in the April 2014 floods, and the National Referral Hospital is presently exposed to flood hazards. Disruption and damage to infrastructure could also hinder transportation of injured or sick people and affect critical water provision, energy supplies and ecosystems on which people rely.

The co-benefits from increasing resilience in the health sector include:

- Socioeconomic benefits from building climate resilient health systems and safeguarding public health include poverty reduction, improved economic productivity and protection of women and children (children under 5 and pregnant women are at heightened risk of VBDs).[172]
- Improving health is a no-regret option as it provides benefits regardless of climate change. Human health is a key component of adaptation activities across all sectors and a healthy population is a resilient population.
- Adaptation projects also have health benefits including flood protection, disaster risk reduction and climate resilient food systems.[173]

The highest priority climate-sensitive health risks for Solomon Islands are shown in Table 5.29.

The vision of National Health Strategic Plan (NHSP) 2016–2020 is to reduce sickness, prevent the loss of young lives and relieve suffering. The vision for health goes beyond fighting disease to contribute to the wellbeing of all Solomon Islanders. A key objective of NHSP is to prepare for disasters and climate change.

Table 5.29 Assessment of key climate change risks in Solomon Islands[174]

Categories	Health issue
Direct effects	• Health impacts of extreme weather events. • Heat-related illness.
Indirect effects	• Water security and safety (including water-borne diseases). • Food security and safety (including malnutrition and food-borne diseases). • Vector-borne diseases. • Respiratory illness. • Disorders of the eyes, ears, skin and other body systems.
Diffuse effects	• Disorders of mental/psychosocial health. • Non-communicable diseases (NCDs).

5.10.2 Access to climate finance

There have been limited projects in the health sector in Solomon Islands. For example, the Global Environment Fund is presently financing a project titled Building Resilience of Health Systems in Pacific Island LDCs to Climate Change, which is being implemented by the World Health Organization and United Nations Development Programme. This project involves enhancing capacity of national and local health institutions to manage health risks induced by climate variability and change.

There have been a number of past successes in other sectors that have co-benefits from achieving health outcomes. This includes the Honiara Flood Risk Study and Management Plan project implemented by the World Bank, which has identified options for reducing exposure and

171 Jones, FK, Al Ko, C Becha, C Joshua, J Musto, S Thomas, A Ronsse, CD Kirkwood, A Sio, A Aumua and EJ Nilles (2016), 'Increased Rotavirus Prevalence in Diarrheal Outbreak Precipitated by Localized Flooding, Solomon Islands, 2014', *Emerging infectious diseases*, 22(5), 875–879, available at: https://doi.org/10.3201/eid2205.151743

172 Bardosh, KL, SJ Ryan, K Ebi et al. (2017), 'Addressing vulnerability, building resilience: community-based adaptation to vector-borne diseases in the context of global change', *Infect Dis Poverty* 6, 166, available at: https://doi.org/10.1186/s40249-017-0375-2

173 Campbell-Lendrum D, L Manga, M Bagayoko, J Sommerfeld (2015), 'Climate change and vector-borne diseases: what are the implications for public health research and policy?', *Philos Trans R Soc Lond B Biol Sci.* 5, 370(1665): 20130552.

174 World Health Organization (2015), Human health and climate change in Pacific island countries.

Table 5.30 Status of climate finance projects in the health sector[175]

Financing priorities	Identify and plan for climate change risks in the health sector, control of waterborne and vector-borne diseases (including strengthening malaria control), and develop disaster and emergency response plans.
Financing status	Limited progress: Additional assistance is needed, particularly to deliver actions and strengthen capacity.

vulnerability of Honiara's communities and health infrastructure to flood risks.

Only one project has been funded by climate finance between 2016 and 2018 to address directly these issues in the health sector. This project is listed in Appendix A. Table 5.30 provides an overview of the status of climate finance projects in the health sector.

Actions related to climate change in NHSP 2016–2020 and Solomon Islands–WHO Country Co-operation Strategic Agenda 2018–2022 are outlined in Table 5.31.[176]

In addition, Table 5.32 details the key sources of financing for the health sector in Solomon Islands.

5.10.3 Potential data utilisation and application

The health sector in Solomon Islands still climate vulnerable – the main hospital in the country is located in the coastal inundation area. Recently MoH is using SRS to support the relocation of their hospitals and also the development of new clinics in the country.

SRS based data can be used in a cost-effective manner to monitor weather, climate, environmental and anthropogenic factors that influence the spread of vector-borne diseases (VBDs) in Solomon Islands, including malaria, dengue fever and lymphatic filariasis. As VBDs are linked to climate

Table 5.31 Actions in health sector[177]

Action	NHSP 2016–2020	WHO 2018–2022
Increase the provision of safe drinking water and sanitation to communities.	✓	×
Strengthen malaria control to reduce transmission and accelerate elimination by providing technical support to refine national malaria guidelines and assisting the Ministry of Health and Medical Services to strengthen health systems.	✓	✓
Reduce number and intensity of food and water-borne outbreaks.	✓	✓
Prepare Solomon Islands health providers for disasters, outbreaks and emerging population health issues.	✓	✓

Table 5.32 Key sources of climate financing for the health sector

Financing instruments	GoSI should primarily access grant financing, but for projects that have indirect health outcomes, such as strengthening flood management, concessional loan financing could be accessed on a case-by-case basis.
Financing sources	Financing sources for direct health-related projects will include the GCF, GEF (LCDF), and UN agencies (WHO, UNDP). For indirect health-related projects, the sources of financing will be varied as outlined in sectoral assessments in this document.

175 *Author's own analysis.*
176 World Health Organization (2018), 2018–2022 Country Co-operation Strategy at a glance.
177 Ibid.

and environment, this knowledge, developed using remotely sensed data, could be used to help decision-makers better allocate limited resources in the fight against VBDs.[178]

Vulnerability assessments should first be undertaken to understand current disease control measures, problems related to resistance developed by the mosquitoes, and socioeconomic factors, such as migration of population. Informed by the vulnerability assessment, satellite monitoring can be used to monitor in real-time risks of disease transmission based on climate and environmental factors, including increase in precipitation or in temperature.[179] Therefore, this can be used as an early warning system for reducing the risk of VBDs.[180] Once control measures are in place and projects are under implementation, satellite data can be used to assess the efficacy of the intervention.

SRS data can also be used to understand the exposure of communities, and associated health infrastructure, to climate change hazards. SRS data could be used to monitor urban and peri-urban growth and, in concert with hazard mapping (e.g. flood hazard and coastal hazard maps), be used to determine the climate change risk for particular communities and inform suitable locations for clinics and hospitals. Given that health outcomes are also driven by reducing climate change risk in the other key sectors, including the agriculture, infrastructure and water sectors, the use of satellite monitoring in these sectors could also lead to improved health outcomes.

178 Ceccato, P, B Ramirez, T Manyangadze, P Gwakisa, and M Thomson (2018), 'Data and tools to integrate climate and environmental information into public health', *Infectious Diseases of Poverty*, available at: https://idpjournal.biomedcentral.com/articles/10.1186/s40249-018-0501-9

179 Ford, T, R Colwell, J Rose, S Morse, D Rogers, and T Yates (2009), 'Using Satellite Images of Environmental Changes to Predict Infectious Disease Outbreaks', *Emerging Infectious Diseases,* 15(9), 1341–1346, available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2819876/

180 Rogers, D, S Randolph, R Snow, and S Hay (2011), Satellite imagery in the study and forecast of malaria', *Nature* 415(6872), 710-715, available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3160466/

6. Recommendations for Attracting Climate Finance

While Solomon Islands has developed key national planning frameworks and institutional co-ordination mechanisms (as outlined in Chapter 2), and has successfully attracted climate finance to implement sectoral priorities (as outlined in Chapters 3 and 5), further action is needed to overcome implementation barriers.

GoSI recognises that increased mobilisation of climate finance is needed for achieving its adaptation and mitigation targets. The mobilisation and disbursement of climate finance remains a key challenge in Solomon Islands due to a lack of scalable, tested and bankable projects capable of attracting private sector investment, and a lack of trained technical staff capable of developing and delivering a strategic pipeline of projects with appropriate documentation (particularly for multilateral financing sources).

This chapter outlines the barriers to attracting climate finance and articulates recommendations for addressing these challenges. Attracting additional flows of climate finance, and implementing the measures outlined in national and sectoral policies, strategies and plans, will require improved governance and co-ordination, better utilisation of data, strengthened technical capacity, strong policy and regulatory design, and increased private sector engagement.

The results of this assessment, including the status of plans and strategies, are summarised in Table 6.3.

6.1 Governance mechanisms

As a cross-cutting challenge, addressing climate change requires strong co-ordination and communication across sectors. GoSI has established the Department of Climate Change, under the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM). To build on the progress made by Solomon Islands, the following recommendations are suggested:[181]

- A number of Solomon Islands Government line ministries are implementing climate change and disaster risk management related activities. However, this is currently being undertaken in a siloed approach. More effective co-ordination at the national level, between stakeholders (central and local government agencies, and development partners) and between the public sector and private sector is needed to reduce duplication of efforts and target resources. There have also been challenges with operationalising the National Climate Change Committee (NCCC) and the National Climate Change Working Group (NCCWG). To achieve this, GoSI should operationalise and establish a national climate change co-ordination mechanism with National Climate Change legislation. This should utilise lessons learnt and models being implemented at the national, provincial and sectoral levels, as well as in other countries. The engagement of MDPAC within such a mechanism is recommended.
- Cross-sectoral policies need to focus on co-ordination and resourcing horizontally (across government and non-governmental sectors) and vertically where implementation at the provincial level is important. Development of a capacity is also vital for delivering sustainable and long-term impacts, and overcoming the experience of project 'overload' (this is outlined in section 6.2).
- Develop open and transparent climate change decision-making and improve climate governance reporting. In relation to climate change funds, it is particularly important that a transparent selection of project beneficiaries and project implementing agencies is demonstrated. National roundtables could be established to foster dialogue and engagement with a broad range of stakeholders who are undertaking climate change work.
- Strengthen provincial level institutions through operationalising climate change committees and dedicating appropriate resourcing to ensure sustainability (through inclusion of costed

181 Pacific Community, the Pacific Islands Forum Secretariat, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH and the United Nations Development Programme (2017), Solomon Islands Climate Change and Disaster Risk Finance Assessment.

items in relevant policies and plans). Look at the need for establishing provincial ordinances to strengthen the mandate for co-ordinating mechanisms at the provincial level.

- Utilise current community-based awareness-raising and training programmes presented through the Rural Development Programme (RDP) and other mechanisms for mainstreaming awareness around climate change at the community level.
- Develop partnerships to formulate proposals and concept notes through establishing a Project Preparation Unit (the support to establish this unit will be funded by GCF Readiness Assistance).

Key stakeholders involved in the governance of climate change are described below and are listed in Table 6.3.

6.1.1 Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM)

MECDM brings together a number of departments and units. The Climate Change Department under this ministry has staff dedicated to implementing climate change related projects.

Effective information sharing and engagement between the Climate Change Department and other key stakeholders is crucial for achieving climate change action. Collaboration between the Climate Change Department and sectoral ministries should include support to access climate finance, sharing climate information that is appropriate and to the standard necessary for the specific sector, and ensuring that sectoral activities are contributing to achievement of climate change commitments, goals and targets.

MECDM has key roles and responsibilities in accessing climate finance, and is the National Designated Authority for the GCF, operational focal point for the GEF, and is the national focal point for the UNFCCC. In relation to its GCF responsibilities, MECDM is at present under-resourced and overwhelmed with other competing responsibilities and priorities.

The Climate Change Department has a Project Management Unit (PMU), which requires strengthening to ensure it can efficiently and effectively co-ordinate, share information, monitor and evaluate projects and develop project pipelines.

MECDM also has a Programme Management and Co-ordination Unit (PMCU). The PMCU was established to co-ordinate and support the management and implementation of project and projects under MECDM (from the four technical divisions including the Climate Change Department, Solomon Islands Meteorological Services, the Environment and Conservation Division and the National Disaster Management Office).

6.2 Capacity development

Human capacity is a critical element and key enabler for Solomon Islands to be able to effectively access, manage, disburse, monitor and report on climate change finance. Solomon Islands continues to be highly constrained by capacity and technical barriers, and strengthening capacity is a national priority for the country. A key challenge is the lack of staff to effectively fulfil responsibilities of MECDM and sub-national agencies.

The following actions are recommended for building capacity:[182]

- Capacity building and awareness/advocacy initiatives should be focused and relevant to national, local and community contexts. A human capacity development roadmap should be developed. Staff involved in climate change projects should be given training which is linked to a formal professional development strategy and focuses on building technical expertise related to climate change, including best practice for designing, implementing and monitoring projects and programmes.
- All climate change projects accessed by Solomon Islands must have an embedded component related to capacity development and transfer of knowledge. This will ensure external consultants provide an added value to government. Ideally, capacity development should be provided through long-term in-country initiatives, rather than short-term, ad hoc and piecemeal support. The CCFAH and Global Green Growth Institute models of embedded support should be expanded, including to key line ministries and local government as possible.
- Solomon Islands National University should be resourced to provide in-country capacity building related to CCDRM for government

182 Ibid.

officers. MECDM should engage and draw on technical expertise from different line ministries (different line agencies in Solomon Islands have sufficient capacity to access and manage climate finance).

- To overcome systemic capacity challenges, GoSI should explore options to provide additional incentives for attracting strong expertise and retaining human capacity. This could include a mechanism that engages retired public servants at the community level who are willing to support climate change efforts. This would be an effective option to strengthen the capacity of communities, promote transfer of knowledge and build institutional memory.
- Build sufficient technical expertise and human resource capacity for gender and social inclusion into the development of programmes across relevant ministries and departments. The assessment has highlighted the provincial level as needing the most investment in capacity.
- Capacity building should be conducted on the application and utilisation of satellite data. The establishment of an interoperable centralised data storage system for EO and other forms of data would strengthen planning and decision-making.
- Climate change information should be easily accessible to stakeholders (e.g. through translation into local languages and strengthening MECDM website).

At present, a number of development partners are providing support to Solomon Islands on overcoming capacity barriers and technical challenges. This includes support from the GCF Readiness and Preparatory Support programme on the accreditation of the Ministry of Finance and Economic Management (MFEM) as a GCF Direct Access Entity.

6.3 Information and data utilisation

A key challenge is a weakness in policies, procedures, and guidelines for acquiring, sharing and utilising EO services. Existing procedures are often not harmonised between agencies that need to co-operate, such as national and sub-national governments during disasters. With the exception of the Forest Policy (2020), recently developed strategies and plans contain minimal references on the potential use of EO data, either for designing interventions or completing monitoring and evaluation of implementation progress. This could be because these plans and strategies were led by sectoral ministries and central agencies, which at present do not have strong capacity or capabilities in EO data application.

While pilot activities have been undertaken and there are examples of successful EO data utilisation, the benefits and potential of these activities need to be demonstrated to other sectors. There is a greater need for effective, user-friendly and tailored tools to bridge the gap between departments and officials with a strong understanding of EO data – such as Solomon Islands Meteorological Service (SIMS) – and other end users in MECDM and sectoral agencies. Expanding the use of EO data in climate finance projects will be a strong lever for expanding awareness on the benefits of using EO data, strengthening climate action, and building support for incorporating the use of EO in sectoral and national plans and strategies.

Undertaking capacity building and training on EO data applications, processing and utilisation is another key priority. At present, Solomon Islands does not have capabilities in utilising, analysing and interpreting SRS/EO data and geospatial information at the country level. Processing geospatial information into a form that can be effectively used for accurate and evidence-based decision-making can be very time consuming and errors can easily be made.[183] In addition, Solomon Islands lacks the infrastructure to process and visualise satellite data, and installation of a new satellite dish is considered a priority by SIMS.[184]

Previously, training has been undertaken in Solomon Islands on the use of SRS and geospatial information. For example, SIMS has received training on the use of data from the Himawari-8, a Japanese meteorological satellite, for monitoring and forecasting severe weather in the region, such as tropical cyclones and heavy rainfall. A national DRR workshop from CommonSensing was also

183 UN ESCAP (2018), Good practices and emerging trends on geospatial technology and information applications for the Sustainable Development Goals in Asia and the Pacific, available at: https://repository.unescap.org/handle/20.500.12870/3037

184 SIMS (2018), *Solomon Islands Country Report*, Joint Meeting of RA II WIGOS Project and RA V TT-SU, Jakarta, Indonesia.

held, which communicated possible solutions and products to key stakeholders and sought feedback in terms of usefulness and priorities.[185]

Future training should be undertaken to build capacity and awareness of all potential users, including central government agencies and sectoral ministries, and could focus on data needs for specific sectors and reporting approaches. In particular, further training should be provided to SIMS officials on the capabilities of EO and how it could be utilised for climate change projects. SIMS should also consider hiring a staff member to champion the use of EO data in the design, implementation, monitoring and evaluation of climate change projects and programmes. Capacity building has largely been conducted by development partners and regional organisations, and there is also scope for SIMS to undertake training for national stakeholders.

Additional recommendations for strengthening the processing and utilisation of EO data include:

- A greater focus on local/community level information and data is needed, as well as local and traditional knowledge, especially around vulnerability assessments and adaptive capacity. A more comprehensive focus on undertaking standardised national vulnerability and adaptation assessments (rather than relying on an ad hoc approach that is based on project implementation) would help to focus this.[186]
- Collecting and maintaining inventory information on communities, buildings and infrastructure will assist in quantifying the impacts of natural hazards. The location, purpose, value and condition of existing coastal protection assets should also be catalogued. Such information is important for asset maintenance and upgrade programmes, and for decisions on future expenditure.
- Strengthen data collection capacity, particularly in the forestry, agriculture and waste sectors which at present lack the capacity to estimate and monitor sectoral GHG emissions.[187] The completion of a GHG inventory for 2011–2019 is required, and this should be done as either a part of the Third National Communication and/or Biennial Update Report.
- Develop a standardised data management system to support evidence-based policy -making and prioritisation, developing M&E processes and more efficient reporting.
- Clarification on the role of different entities and how each is capturing and sharing data and information will be necessary to inform more aligned and effective information management processes.
- Incorporating data analysis into planning and decision-making processes, and prioritising highly vulnerable communities and individuals with special needs.
- Quantitative indicators, such as mandating sex disaggregated data collection across all ministries, should also be a priority. Qualitative indicators could include women's representation in consultative processes and assessments.
- Data should be stored, maintained and secured centrally as an important resource for Solomon Islands. A programme to maintain and update data in the database should be financed, given that assets and populations change over time.
- Where possible, data initiatives should capitalise on existing institutions and technical architecture for knowledge management.

6.4 Climate change policies, strategies and plans

As outlined in Chapter 2, GoSI has developed a number of significant climate change plans and strategic frameworks in recent years, including the NDC 2015 and sectoral plans with climate change actions. While national and sectoral

185 UNITAR (2020), 'Advanced training on Earth Observation (EO) and Geospatial Information Technology (GIT) Applications for Climate Resilience (Solomon Islands)', available at: https://www.unitar.org/event/full-catalog/advanced-training-earth-observation-eo-and-geospatial-information-technology-git-0

186 Pacific Community, the Pacific Islands Forum Secretariat, the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH and the United Nations Development Programme (2017), Solomon Islands Climate Change and Disaster Risk Finance Assessment.

187 Government of Solomon Islands (2017), Second National Communication.

Table 6.1 Review of plans, strategies and policies[188]

Plan	Climate change component	Defined actions / outcomes	Costed actions / outcomes	Responsibility allocated	M&E framework[189]
	National				
National Development Strategy 2016–2035	**Strong**	✓	✓	×	×
Nationally Determined Contribution 2015	**Strong**	✓	✓	×	×
National Climate Change Policy 2012–2017	**Strong**	✓	×	✓	✓
National Infrastructure Investment Plan 2013–2023	**Strong**	✓	✓	✓	✓
National Disaster Management Plan 2018	**Strong**	✓	×	✓	✓
	Sectoral				
National Energy Policy and Strategic Plan 2014	**Strong**	✓	✓	✓	✓
National Transport Plan 2017–2036	**Moderate**	✓	✓	×	✓
REDD+ Readiness Roadmap	**Strong**	✓	✓	✓	✓
National Forest Policy 2020	**Strong**	✓	×	×	✓
National Waste Management and Pollution Control Strategy 2017–2026	**Strong**	✓	×	✓	✓
Islands National Biodiversity Strategic Action Plan 2016–2020	**Moderate**	✓	×	×	×
Agriculture and Livestock Sector Policy 2015–2019	**Strong**	✓	×	×	×
Water and Sanitation Implementation Plan 2017–2033	**Strong**	✓	×	×	×
National Health Strategic Plan 2016–2020	**Moderate**	✓	×	✓	✓

strategies and plans have included climate change related priorities, the country's planning and implementation capacity remains inadequate.

Table 6.1 provides a review of national and sectoral frameworks in relation to best practices, and Table 6.2 outlines the criteria for reviewing climate change components.

The following actions are suggested to strengthen the design, development and implementation of climate change policies, strategies and plans:[190]

- While a number of climate change policy and planning mechanisms are in place (as outlined in Chapters 2 and 4), the regulatory and legal frameworks for implementing climate action

188 *Author's own analysis.*

189 A number of plans include a high-level results framework, but lack indicators and sources of verification. A number of plans also state that a separate monitoring and evaluation framework will be developed to track progress.

190 Pacific Community, the Pacific Islands Forum Secretariat, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH and the United Nations Development Programme (2017), Solomon Islands Climate Change and Disaster Risk Finance Assessment.

Table 6.2 Criteria for reviewing climate change components of planning frameworks

Status	Criteria
Strong	Provides an overview of mitigation/adaptation opportunities and barriers, and includes defined actions/outcomes to address mitigation/adaptation.
Moderate	Provides a limited overview of mitigation/adaptation opportunities and barriers, and/or includes limited actions/outcomes to address mitigation/adaptation.
Inadequate	Provides an inadequate overview of mitigation/adaptation opportunities and barriers, and/or includes inadequate actions/outcomes to address mitigation/adaptation.

require strengthening. Key regulatory barriers include inadequate tax regime and property rights, and a lack of enforcement of the regulations and standards that are in place.

- GoSI has developed and endorsed a number of key sectoral and national policies, but there remain limited resources and capacity to convert policy into tangible actions on the ground.
- Strengthening sectoral strategies and plans to enhance access, delivery and reporting on climate finance is also a priority. As shown in Table 6.1, the majority of plans and strategic frameworks do not include a costed implementation plan, which results in difficulties mobilising finance and prioritising actions. In addition, some plans and frameworks do not adequately allocate responsibilities and roles, which is particularly important for cross-sectoral actions and initiatives such as the NDC. Monitoring and Evaluation (M&E) systems are weak or non-existent in most ministries and agencies, and therefore the achievements may not be adequately reported – an iterative process. M&E could be developed as a dedicated function of MECDM's PMCU, in close collaboration with MDPAC's M&E Unit.[191] The current corporate, strategic and business planning process of different ministries and departments are also inadequate, with many agencies not having plans. To strengthen these frameworks, sectoral agencies should be supported to develop plans and strategies that are costed, with responsibilities allocated and strong M&E systems established.
- The development of new policies and plans should ensure vertical integration to align national, provincial and community priorities, including targeted actions that are costed within policies, which can also help to ensure climate change activities are prioritised in the budget, and planning processes are effectively resourced. There is also a need to identify entry points for mainstreaming climate change issues more effectively into provincial plans. In the longer term, consider the development of specific provincial level climate change policies or ordinances.
- The government should conduct comprehensive medium- and long-term climate change adaptation planning that builds on its existing adaptation activities and help integrate climate change into national decision-making policies and budgeting. GoSI should progress the development of a National Adaptation Plan that is aligned with the NDS, National Disaster Management Plan (NDMP) and sectoral policies, strategies and plans. In parallel with the development of the National Adaptation Plan, a national climate change risk assessment should be undertaken to assist with prioritising adaptation actions. Moreover, GoSI should prioritise the completion of community risk assessments and adaptation planning, particularly for highly-vulnerable and isolated communities.
- To achieve mitigation objectives, GoSI should also explore the development of a Low Emissions Development Strategy linked to the new NDC.
- GoSI should develop a centralised monitoring, reporting and verification system to assess the status and progress of its actions on greenhouse gas emissions by sources and removals by sinks, mitigation contributions and its adaptation goals.
- Develop national mainstreaming guidelines to assist in identifying key entry points for line ministries in order to progress the inclusion of climate change as a cross-cutting issue

191 Ibid.

in sectoral policies, plans and activities (effectiveness and climate relevance of plans are shown in Table 6.1). For those plans and strategies which have moderate/inadequate climate change components, an interim sectoral action plan could be developed to advance climate change actions and measures.

Solomon Islands is accessing finance from the GCF Readiness and Preparatory Support programme to assist with strengthening policy, regulatory and legislative development, implementation and enforcement.

6.5 Strengthening financial frameworks

Solomon Islands requires scaled-up and targeted financial resources to be able to effectively respond to the adverse effects of climate change. The country requires additional climate finance to meet current and future needs, particularly with increasing climate change and natural disaster risks. The following recommendations are suggested to strengthen financial frameworks:[192]

- There is a lack of financing to cover higher upfront costs for achieving low-carbon climate resilient development government must remain flexible and not limit its options on the kind of instruments that it can access for climate change. New or significantly expanded financial instruments and support are needed (appropriate finance instruments could include risk mitigation instruments, equity, insurance products, and incremental financial support) for implementing, monitoring and enforcing national plans, strategies and policies. For example, increasing the use of renewable energy sources for power generation in urban and rural areas to 79 per cent by 2030 is estimated to cost US$75 million between 2014 and 2030, which will require international mitigation financing.[193] Therefore, GoSI requires further assistance to design, implement, and capitalise expanded financial instruments and modalities, and these should also have a focus on strengthening household and the private sector access to financial products and services.
- Limited co-financing is available for climate change projects. In addition, as many Accredited Entities to the GCF are multilateral development banks, there is a risk that co-financing will primarily be in the form of loans, particularly for mitigation projects and infrastructure projects, which could result in unmanageable debt levels. GoSI should provide thorough economic assessments on the benefits of providing government co-finance and incurring debt to fund climate action.
- Climate finance is often delivered as 'off-budget' aid and is not adequately tracked by GoSI financial systems. Tracking adaptation and mitigation measures would be greatly facilitated if budgetary processes were updated so that climate change and environment related initiatives can be accounted for and tracked in budgetary processes.
- Mobilise financing for sub-national agencies, including operationalising mechanisms such as Provincial Climate Change Committees. Potential solutions include the establishment of provincial ordinances to provide the relevant mandate at the provincial level for these committees.
- Mobilising private sector investment is a priority, including the identification and development of financing modalities to support private sector uptake of commercial proven measures at scale. In order to implement the climate change measures prioritised in strategies and plans, the private sector will have to provide a significant contribution to reach required investment levels. GoSI lacks experience in engaging the private sector in climate action – this could be catalysed by developing formal arrangements (e.g. public-private partnerships). Finance could also be mobilised through charging a tax on fossil fuel consumption and other carbon-intensive activities.
- Develop costed strategies and plans, including an NDC Financing Strategy and GCF Country Programme, which will allow for climate change actions to be translated into national and provincial budgets,

192 Pacific Community, the Pacific Islands Forum Secretariat, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH and the United Nations Development Programme (2017), Solomon Islands Climate Change and Disaster Risk Finance Assessment.

193 Government of Solomon Islands (2014), Solomon Islands National Energy Policy and Strategic Plan: Volume One.

strengthened resource mobilisation, and improved measurability of outcomes. This is recommended as a joint activity between MECDM, Ministry of Finance and Treasury (MoFT), Ministry of Development Planning and Aid Co-ordination (MDPAC), sectoral agencies and sub-national agencies.

- Achieving direct access to climate funds, particularly the Green Climate Fund. The government has identified the Ministry of Finance and Treasury (MoFT) and the National Transport Fund (NTF) within the Ministry of Infrastructure Development as the two potential GCF direct access accredited entities. To support this, GoSI has established a new Climate Resilience Finance Unit (CRFU) within MoFT, and NTF has received support with the accreditation process from the USAID Climate Ready Project. In addition, GCF Readiness and Preparatory support is being provided through SPREP to support accreditation.
- GoSI is prioritising the establishment of a national climate change trust fund for priority climate change measures. This trust fund could also potentially act as a GCF direct access entity.
- GoSI is receiving support from development partners to overcome financial barriers, but long-term support is required given the systemic nature of these challenges. Therefore, the CCFAH technical assistance, with its model of long-term embedded support, will be appropriate and beneficial for GoSI.

6.6 Private sector activities

Private sector engagement in the climate change space has been minimal in Solomon Islands. This is due to a number of challenges, including limited engagement and co-ordination, constrained access to finance, the private sector being largely small and medium enterprises, and private sector entities seeing limited return on investment over the short term.

Strengthened engagement of the private sector is crucial for mobilising private sector finance, delivering transformational outcomes at scale and ensuring sustainable project delivery. To further improve the engagement of the private sector within the climate change space in Solomon Islands, the following actions are recommended:[194]

- Provide a conducive and enabling commercial environment (including through providing tax incentives and strengthening regulatory frameworks) in order to make a good business case for adaptation and mitigation projects. This will lead to further mobilisation of private sector finance and strengthened engagement of private sector entities.
- Building capacity of the private sector to respond to climate change – for example, strengthening awareness, knowledge of available technologies and market opportunities among key stakeholders and core actors in the investment value chain.
- Supporting private sector entities to access climate finance through identifying opportunities and supporting with proposal development and bureaucratic requirements, which would result in reduced transaction costs. Establishing the Project Preparation Unit will support with achieving this recommendation – support is being provided to establish this unit by GCF Readiness Assistance.
- Solomon Islands Chamber of Commerce and Industries (SICCI) is quite active and could be a conduit for private sector engagement in climate change and disaster risk financing. The establishment of an Economic Advisory Council, through SICCI, may be an entry point and specifying the inclusion of climate change disaster risk management, and financing issues within the ToR of this council is recommended.
- SICCI also has a role to convene forums to discuss and investigate financing opportunities for development, including climate change finance. SICCI should consider convening an annual private sector forum with specific focus on financing for development, including climate change finance (e.g. GCF or regional organisations can be invited to facilitate).

6.7 Stakeholder engagement

Strong stakeholder engagement is vital for achieving climate action, and this includes engaging with line ministries, provincial administrations, communities, NGOs and the private sector. To strengthen stakeholder engagement, the following actions are recommended:[195]

194 Ibid.

195 Ibid.

- Engagement with line ministries in climate change processes is vital for achieving sectoral goals and targets, ensuring climate finance is allocated towards achieving specific sectoral needs, co-financing opportunities are realised, and the expertise present in line ministries is effectively utilised in project design and implementation.
- Strengthen co-ordination and engagement between government and non-government agencies to exchange information and maximise the potential for collective impact of a whole-of-government approach and of both government and non-governmental sectors.
- Strengthen engagement with faith-based organisations, especially women's and youth groups as potential implementers of climate change activities.
- It is crucial that the most appropriate organisations are engaged in climate finance projects, and this is based on the organisation's sectoral expertise, its footprint in the project area, and its ability to advocate on behalf of communities and other project beneficiaries.
- Engagement with provincial administrations is required to build capacity and strengthen understanding of climate change financing opportunities and requirements for developing and implementing low-carbon climate resilient activities. Provincial Climate Change Committees (PCCCs) have been established in all nine provinces and should be strongly engaged; however, strengthen engagement will require effective resourcing and operationalisation.
- Greater engagement of communities and community-based mechanisms is required. Utilising current mechanisms that are operating within communities is recommended. NDMP 2018 outlines Ward and Village Disaster and Climate Risk Committees; however, these require strengthening. Community beneficiaries should also be engaged in the design and implementation of climate change projects, and provided with the opportunity to integrate local and traditional knowledge into projects, and provincial and national policies and plans.

6.8 Summary: Assessment of climate finance by sector

The results of the assessment are summarised in Table 6.3. The criteria used for undertaking this assessment are also described in Table 6.4 and Table 6.5.

Table 6.3 Result summary of the climate finance sector specific assessment[196]

Sector / thematic area	Number of projects	Financing status	Financing priorities based on national plans, policies and commitments	Potential financing instruments	Potential sources of climate finance	SRS data application potential	Past SRS data utilisation	Status of planning institutions[197]	Key GoV agencies[198]
Transport	5	Adaptation projects: Satisfactory progress Mitigation projects: Limited data	Low-emissions transport projects, climate resilient road projects	Grant and loan financing	GCF, MDBs, bilateral donors	High	Successful utilisation for CF projects	Strong	NTF, MID
Energy	11	Satisfactory progress	Increasing rural access and RE generation, and implementing energy efficiency measures	Grants, concessional loans, equity and guarantees	GCF, GEF, CIF, MDBs, other multilateral agencies (e.g. UNDP, GGGI, IRENA), bilateral donors (e.g. MFAT, DFAT, JICA)	High	Successful utilisation for CF projects	Strong	MMERE
Forests and land use	15	Satisfactory progress	Afforestation and reforestation programmes, implementation of climate adaptation actions, development REDD+ institutions and processes, capacity building and training.	Grants, REDD+ finance	GCF REDD+ Pilot Programme, GEF, AF, CIF, MDBs, UN agencies (FAO and IFAD), and bilateral donors	High	Successful utilisation for CF projects	Strong	MoFR

196 *Author's own analysis.*

197 In relation to the climate change component of sectoral/thematic plans and strategies (see Table 5.1 for further information).

198 Key government agencies responsible for implementing climate change projects are listed in this column. The engagement of wider stakeholders will be necessary for achieving improved outcomes in sectors/thematic areas, as outlined in section 5.7. This includes other government agencies (e.g. PMO and MIA), provincial governments, CSOs/NGOs, communities, private sector entities, and development partners.

Table 6.3 Result summary of the climate finance sector specific assessment (*Continued*)

Sector / thematic area	Number of projects	Financing status	Financing priorities based on national plans, policies and commitments	Potential financing instruments	Potential sources of climate finance	SRS data application potential	Past SRS data utilisation	Status of planning institutions[197]	Key GoV agencies[198]
Waste	3	Limited progress	Reducing waste emissions, strengthening climate resilience of waste systems	Grants, concessional loans	EU/SPREP (Pacwaste), MDBs (ADB and WB), and bilateral donors (e.g. JICA)	Low	Limited evidence of utilisation	Moderate	MECDM, Provincial government
Ecosystems and ecosystem services	17	Satisfactory progress	Building resilience of inland ecosystems, scaling up of demonstration projects	Grants	GCF, GEF, AF, UNDP, FAO, SPREP, SPC, NGOs (e.g. CI, IUCN), and bilateral donors (e.g. EU, France)	Medium	Limited evidence of utilisation	Inadequate	MECDM
Livelihoods and disaster risk reduction	11	Satisfactory progress	Strengthened EWSs, improved hydrometeorological forecasting/ monitoring, climate resilient livelihoods	Grants	GCF, GEF, AF, CIF, UNDP, MDBs (e.g. WB, ADB), bilateral donors (e.g. DFAT and MFAT)	High	Successful utilisation for CF projects	Moderate	MECDM, MMERE
Resilient infrastructure	2	Satisfactory progress	SI NIIP projects, climate resilient infrastructure, flood and coastal defences, hazard mapping, strengthened regulation, innovative financing mechanisms	Grants, concessional loans	GCF, GEF, AF, CIF, UNDP, MDBs (WB, ADB) and bilateral donors (e.g. DFAT, MFAT and JICA)	High	Limited evidence of utilisation	Strong	MID
Agriculture	9	Satisfactory progress	Climate resilient crops, scale up climate resilient practices, implement community extension models	Grants	GCF, GEF, AF, CIF, FAO, UNDP, MDBs (e.g. WB, ADB) and bilateral donors (e.g. MFAT, AFD, USAID)	High	Successful utilisation for CF projects	Inadequate	MAL

(*Continued*)

Table 6.3 Result summary of the climate finance sector specific assessment (*Continued*)

Sector / thematic area	Number of projects	Financing status	Financing priorities based on national plans, policies and commitments	Potential financing instruments	Potential sources of climate finance	SRS data application potential	Past SRS data utilisation	Status of planning institutions[197]	Key GoV agencies[198]
Water supply and wastewater	16	Satisfactory progress	Increasing access and supply of households and public services to potable water and sanitation, improving infrastructure systems and management, strengthening capacity and improving planning, institutional, regulatory and legislative frameworks.	Grants, concessional loans, equity and guarantees	GCF, GEF, Adaptation Fund, MDBs (ADB, WB), UN agencies (FAO and IFAD), and bilateral donors (JICA, MFAT, DFAT)	High	Successful utilisation for CF projects	Inadequate	MID, MMERE, SIWA
Health	1	Limited progress	Identify and plan for climate change risks in the health sector, control of waterborne and vector-borne diseases, and develop disaster and emergency response plans	Grants	GCF, GEF, and UN agencies (WHO, UNDP). For indirect health-related projects, the sources of financing will be varied.	High	Successful utilisation for CF projects	Moderate	MHMS

Table 6.4 Criteria for assessing SRS data application potential

Status	Criteria
High	• Based on current technology and applications, there is a high potential for using satellite data to improve climate change outcomes.
Medium	• Based on current technology and applications, there is a moderate potential for using satellite data to improve climate change outcomes.
Low	• Based on current technology and applications, there is an inadequate potential for using satellite data to improve climate change outcomes.

Table 6.5 Criteria for assessing the status of planning institutions

Status	Criteria
Strong	• Defined actions/outcomes, costed pipeline of projects, responsibility allocated, M&E framework.
Moderate	• Contains some but not all of: defined actions/outcomes, costed pipeline of projects, responsibility allocated, M&E framework.
Inadequate	• Poorly designed and/or minimal actions/outcomes, costed pipeline of projects, responsibility allocated, M&E framework.

Appendix A: Climate Finance Projects

Table 6.6 Climate change projects (2016–2018)[199]

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Adaptation Fund	Adaptation	Enhancing urban resilience to climate change impacts and natural disasters: Honiara														549,485	549,485
Adaptation Fund	Adaptation	Resilience of Communities to Climate Change Adaptation												646,420			646,420
ADB	Adaptation	Sustainable Transport Infrastructure Improvement Program					✓							8,141,667	8,141,667	8,141,667	24,425,000
Australian Government	Adaptation	United Nations Development Programme Pacific Sub Regional Centre							✓					221,000			221,000

(*Continued*)

199 A number of projects contributed to multiple sectors. The source of the data is from the various funding providers websites, and OECD-DAC. The data from OECD-DAC is available here: https://www.oecd.org/development/stats/climate-change.htm

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	Solomon Islands Transport Sector Based Approach initiative will support Solomon Islands Government to implement a series of activities in the Transport sector.		✓										261,000			261,000
Australian Government	Adaptation	Pacific Risk Resilience Program (PPR) is Australia's Pacific multi-country disaster risk management program.							✓					1,057,000			1,057,000
Australian Government	Adaptation	Solomon Islands Water Authority is Solomon Islands Government-owned corporation responsible for water and sewerage services in urban areas of the country.								✓				1,494,000			1,494,000
Australian Government	Adaptation	Civil Society Water, Sanitation and Hygiene Fund								✓				455,000			455,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	Urban poverty and unemployment, particularly youth unemployment, are among the most serious problems facing Solomon Islands as the country experiences rapid urbanisation.							✓					395,000			395,000
Australian Government	Adaptation	Solomon Islands Transport Sector-Based Approach Phase 2												5,972,000			5,972,000
Australian Government	Adaptation	Fisheries development assistance in the Pacific aims to increase the contribution of fisheries to reducing poverty and achieving sustainable development.						✓							560,000		560,000
Australian Government	Adaptation	The Climate and Oceans Support Program in the Pacific (COSPPac) provides support to National Meteorological Services (NMSs).									✓				32,000		32,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	Funding under this investment represents Australia's contribution to RedR Australia to provide emergency assistance to communities devastated by conflict or major natural disasters.							✓						65,000		65,000
Australian Government	Adaptation	The United Nations Development Programme (UNDP) Pacific Sub Regional Centre (PSRC) promotes effective and efficient collaboration among UN organisations to support development in the Pacific.							✓						427,000		427,000
Australian Government	Adaptation	Pacific Risk Resilience Program (PPR) is Australia's Pacific multi-country disaster risk management program.							✓						327,000		327,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	Solomon Islands Water Authority is the Solomon Islands Government-owned corporation responsible for water and sewerage services in urban areas of the country.								✓					2,139,000		2,139,000
Australian Government	Adaptation	The Civil Society Water, Sanitation and Hygiene (WASH) Fund.								✓					234,000		234,000
Australian Government	Adaptation	Urban poverty and unemployment, particularly youth unemployment, are among the most serious problems facing Solomon Islands as the country experiences rapid urbanisation.							✓						381,000		381,000
Australian Government	Adaptation	The second phase of Solomon Islands Transport Sector-Based Approach will continue to support Solomon Islands Government to implement a series of activities in the transport sector.		✓											2,931,000		2,931,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	The United Nations Development Programme (UNDP) Pacific Sub Regional Centre (PSRC) promotes effective and efficient collaboration among UN organisations to support development in the Pacific.											✓			139,000	139,000
Australian Government	Adaptation	Fisheries development assistance in the Pacific aims to increase the contribution of fisheries to reducing poverty and achieving sustainable development.						✓								133,000	133,000
Australian Government	Adaptation	The Climate and Oceans Support Program in the Pacific (COSPPac) provides support to National Meteorological Services (NMSs).									✓					24,000	24,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	Pacific Risk Resilience Program (PPR) is Australia's Pacific multi-country disaster risk management program.							✓							478,000	478,000
Australian Government	Adaptation	Solomon Islands Water Authority is Solomon Islands Government-owned corporation responsible for water and sewerage services in urban areas of the country.								✓						26,000	26,000
Australian Government	Adaptation	The Civil Society Water, Sanitation and Hygiene (WASH) Fund.								✓						29,000	29,000
Australian Government	Adaptation	Urban poverty and unemployment, particularly youth unemployment, are among the most serious problems facing Solomon Islands as the country experiences rapid urbanisation.							✓							373,000	373,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Australian Government	Adaptation	The second phase of Solomon Islands Transport Sector-Based Approach.		✓												2,319,000	2,319,000
France COOP DECENTRAL/ MAE	Adaptation	Eau et assainissement-Approvisionnement en eau potable - dispositifs de base								✓						17,000	17,000
GEF Least Developed Countries Fund	Adaptation	Community Resilience to Climate and Disaster Risk in Solomon Islands Project							✓					2,000,000	2,500,000	2,300,000	6,800,000
Global Affairs Canada	Adaptation	The Markets For Change (M4C) project.							✓				✓		822,000		822,000
Global Affairs Canada	Adaptation	Markets for Change Pacific Islands / Markets for Change Îles Pacifiques											✓			774,000	774,000
World Bank	Adaptation	RAPID EMPLOYMENT PROJECT												2,012,000			2,012,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Japan Ministry of Foreign Affairs	Adaptation	The water supply and sanitation project for Puapuma Community results in ensuring access to safe water and public hygiene indispensable for human life.								✓				79,000			79,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES								✓				487,000			487,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES												3,000			3,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES												4,000			4,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES											✓		8,000		8,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES									✓				8,000		8,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES											✓			8,000	8,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES								✓						14,000	14,000
Japanese International Co-operation Agency	Adaptation	TC AGGREGATED ACTIVITIES									✓					6,000	6,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Korea International Cooperation Agency	Adaptation	Fellowship program for climate change									✓			10,000			10,000
Korea International Cooperation Agency	Adaptation	Understanding on technology and management in renewable energy												9,000			9,000
Korea International Cooperation Agency	Adaptation	Establishing Water Resources Management Plan and Strategy								✓				9,000			9,000
Korea International Cooperation Agency	Adaptation	To train atmospheric science professionals abroad to complete the advanced learning in current meteorological sciences and technologies									✓			49,000			49,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Korea International Cooperation Agency	Adaptation	To improve the capacity of the water resources policies and strategies by sharing advanced knowledge and skills								✓					12,000		12,000
Korea International Cooperation Agency	Adaptation	Building capacity in the area of developing planning of human resources for Chemical and Environmental Engineering, development co-operation, and adaptation of global climate change with Convergence Technology											✓			44,000	44,000
GEF Least Developed Countries Fund	Adaptation	Solomon Islands Water Sector Adaptation Project (SIWSAP)								✓					12,655,616		12,655,616
NZ Ministry of Foreign Affairs and Trade	Adaptation	Improving Pest Management of Coconut Rhinoceros Beetles in Solomon islands				✓		✓								456,000	456,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
NZ Ministry of Foreign Affairs and Trade	Adaptation	To reduce dependence on imported fuels by turning waste into energy in Solomon Islands.	✓		✓											68,000	68,000
SPREP/ BMUM (German Govt.)	Adaptation	Pacific Ecosystem-based Adaptation to Climate Change									✓				450,833	450,833	901,667
SPREP/SPC	Adaptation	Climate and Oceans Support Program in the Pacific							✓					2,555	2,555	2,555	7,664
The Swedish Research Council	Adaptation	Malaria elimination in the Pacific region.										✓				149,000	149,000
WMO	Adaptation	Programme for Implementing the Global Framework for Climate Services (GFCS) at Regional and National Scales							✓					20,849	20,849		41,697

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Green Climate Fund	Cross-cutting	Tina River Hydropower Development Project								✓					40,313,333	40,313,333	80,626,667
Australian Government	Cross-cutting	The Kastom Gaden Association (KGA) in Solomon Islands (SI).				✓		✓						237,000			237,000
Australian Government	Cross-cutting	The Australia Non-Government Organisations (NGO) Cooperation Program (ANCP) subsidises the poverty reduction activities of accredited Australian NGOs.								✓					17,000		17,000
Australian Government	Cross-cutting	The Capacity Building Work Stream Investment will support capacity building activities for the Water, Sanitation and Hygiene (WASH) sector.								✓			✓			4,000	4,000
Australian Government	Cross-cutting	The Gender Responsive Sendai Framework Implementation: Addressing the Gender Inequality of Risk and Promoting Community Resilience to Natural Hazards in a Changing Climate (GIR) in Solomon Islands.							✓							1,240,000	1,240,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
GEF Trust Fund	Cross-cutting	Integrating Global Environment Commitments in Investment and Development Decision-making													318,750		318,750
GEF Trust Fund	Cross-cutting	Building National and Regional Capacity to Implement MEAs by Strengthening Planning, and State of Environment Assessment and Reporting in the Pacific Islands													195,230	195,230	390,461
GEF Trust Fund	Cross-cutting	R2R: Testing the Integration of Water, Land, Forest and Coastal Management to Preserve Ecosystem Services, Store Carbon, Improve Climate Resilience and Sustain Livelihoods in Pacific Island Countries.				✓			✓		✓			85,714	142,143	142,143	370,000
Japanese International Co-operation Agency	Cross-cutting	TC AGGREGATED ACTIVITIES				✓									30,000		30,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Japanese International Co-operation Agency	Cross-cutting	TC AGGREGATED ACTIVITIES				✓									52,000		52,000
Japanese International Co-operation Agency	Cross-cutting	TC AGGREGATED ACTIVITIES				✓										36,000	36,000
Korea International Cooperation Agency	Cross-cutting	Deployment of Korean experts to Solomon Islands to conduct joint research.				✓		✓						368,000			368,000
Korea International Cooperation Agency	Cross-cutting	Meteorological satellite program, COMS data processing and products, satellite imagery interpretation												18,000			18,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Korea International Cooperation Agency	Cross-cutting	Spatial Planning and Territorial Development, Issues on Contemporary Urban Planning, Climate Change and Sustainable Development.												41,000			41,000
Korea International Cooperation Agency	Cross-cutting	To make capacity building in planning and implementing various strategic policies with regard to climate change in PIC countries.									✓				26,000		26,000
Korea International Cooperation Agency	Cross-cutting	KOICA-Hankuk University of Foreign Studies Cooperation Program: Master's Degree Program in Atmospheric Environment.											✓			76,000	76,000
Korea International Cooperation Agency	Cross-cutting	To enhance the capacity building of fisheries education						✓					✓			36,000	36,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
NZ Ministry of Foreign Affairs and Trade	Cross-cutting	The detailed design, procurement, installation and commissioning of four hybrid mini-grids in the villages of Hauhui, Namugha, Sasamunga and Vonunu.	✓											180,000			180,000
NZ Ministry of Foreign Affairs and Trade	Cross-cutting	The detailed design, procurement, installation and commissioning of four hybrid mini-grids in the villages of Hauhui, Namugha, Sasamunga and Vonunu.	✓												4,893,000		4,893,000
NZ Ministry of Foreign Affairs and Trade	Cross-cutting	This Activity will support the protection of forests and the ecosystem services they provide, through delivery of alternative source of revenue for landowners.				✓					✓				22,000		22,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
UNDP	Cross-cutting	Solomon Islands Ministry of Environment, Climate Change, Disaster and Meteorology Capacity Development Project												308,180	356,190	98,900	763,270
UNDP	Cross-cutting	Environment Management and Climate Change									✓			2,530	8,320	781	11,631
ADB	Mitigation	Capacity Building and Sector Reform for Renewable Energy Investments in the Pacific	✓													32,951	32,951
ADB	Mitigation	Solomon Islands: Solar Power Development Project	✓												2,110,000	2,110,000	4,220,000
Australian Government	Mitigation	Solomon Islands Growth Program (SIGP).	✓	✓									✓		13,419,000		13,419,000
Australian Government	Mitigation	The Pacific Public Administration Governance Initiative.											✓			149,000	149,000
Australian Government	Mitigation	Solomon Islands Growth Program (SIGP).	✓										✓			12,882,000	12,882,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
France Ministry of Foreign Affairs	Mitigation	Volontariat International - P209 - Iles Solomon - ONG Française.											✓			10,000	10,000
GEF Trust Fund	Mitigation	Integrated Forest Management in Solomon Islands				✓									7,304,860	7,304,860	14,609,721
GIZ	Mitigation	The project supports 20 communities in Choiseul and Western Provinces of Solomon Islands to sustainably manage their forests				✓		✓							515,000		515,000
World Bank	Mitigation	COMMUNITY ACCESS AND URBAN SERVICES ENHANCEMENT PROJECT		✓			✓		✓	✓						10,183,000	10,183,000
World Bank	Mitigation	GEF ELECTRICITY ACCESS AND RENEWABLE ENERGY EXPANSION PROJECT	✓													8,438,000	8,438,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES				✓		✓						16,000			16,000
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES												4,000			4,000
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES				✓		✓						116,000			116,000
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES				✓									21,000		21,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES			✓										72		72
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES	✓												14,000		14,000
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES				✓									194,000		194,000
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES			✓											136,000	136,000
Japanese International Co-operation Agency	Mitigation	TC AGGREGATED ACTIVITIES				✓										333,000	333,000

(*Continued*)

Table 6.6 Climate change projects (2016–2018 (*Continued*)

Funding source	Focus	Project name	Energy generation and access	Transport	Waste	Forests and land use	Resilient Infrastructure	Agriculture	Livelihoods and DRR	Water	Ecosystems and ecosystems services	Health	Climate readiness	2016	2017	2018	Total
Korea International Cooperation Agency	Mitigation	To educate governmental officials of developing countries in the areas of energy science and policy in order to enhance their comprehensive competency for nurturing start-ups											✓			32,000	32,000
NZ Ministry of Foreign Affairs and Trade	Mitigation	This six month pilot is an innovation that aims to trial/test a complete solar-wind-diesel hybrid system at the Bishop Koete Rural Training Centre on Ngela Island, Solomon Islands.	✓												69,000		69,000
SREP	Mitigation	Solar Power Development Project	✓												1,550,000	1,550,000	3,100,000
Total number of projects		**98**	**11**	**5**	**3**	**15**	**2**	**9**	**16**	**17**	**11**	**1**	**14**	**24,704,914**	**103,288,418**	**101,804,739**	**229,798,017**

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