

DISASTER RISK REDUCTION IN SURINAME

SITUATIONAL ANALYSIS
2022



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Index

Acknowledgements.....	3
Index	4
List of Acronyms	6
Suriname at a Glance	8
Executive Summary	9
Priority Areas for Action.....	11
1.Introduction	13
1.1 Human and Social Impacts of Disasters	13
1.2 Economic Impact of Disasters	14
1.3 Social Demographic Characteristics	16
1.4 Natural and Landscape Characteristics	18
2. Disaster Risk Profile.....	21
2.1 Hazards	21
2.2 Vulnerability	24
2.2.1 Social Vulnerability	24
2.2.2 Physical Vulnerability	27
2.3 Exposure.....	28
3. Governance Framework.....	29
3.1 Commitments to International Frameworks	29
3.1.1 Sustainable Development Goals	29
3.1.2 Sendai Framework for Disaster Risk Reduction	29
3.1.3 The Paris Agreement on Climate Change	30
3.1.4 Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway	30
3.2 Regional Frameworks	30
3.2.1 Comprehensive Disaster Management Strategy and Programming Framework.....	30
3.2.2 CDEMA Contingency Plans.....	31
3.2.3 Caribbean Resilience Framework.....	31
3.2.4 Agreement Establishing the Caribbean Public Health Agency	32
3.2.5 Antigua and Barbuda Declaration on School Safety	32
3.3 National Framework.....	32
3.3.1 National Development Plan 2017-2021	32
3.3.2 National Climate Change Policy, Strategy and Action Plan, 2014-2021	33
3.3.3 Nationally Determined Contributions, 2020.....	33
3.3.4 National Adaptation Plan, 2019-2029.....	33
3.3.5 National REDD+ Strategy, 2019	34
3.3.6 Environmental Framework Act, 2020	34
3.3.7 Agriculture Disaster Risk Management Plan, 2019.....	34
3.4 Institutional Framework.....	34
3.4.1 National Context.....	34

3.4.2 Local Government and Community.....	35
4. Policy Coherence.....	37
4.1 Strategic Coherence	37
4.2 Conceptual Coherence.....	37
4.3 Institutional Coherence	38
4.4 Operational Coherence	38
4.5 Financial Coherence	39
4.6 Monitoring, Evaluation and Reporting Coherence.....	39
5. Disaster Risk Reduction Interventions and Capacities.....	41
5.1 Priority 1 – Understanding Disaster Risk.....	41
5.2 Priority 2 – Strengthening Disaster Risk Governance to Manage Disaster Risk	42
5.3 Priority 3 – Investing in Disaster Risk Reduction for Resilience.....	45
5.4 Priority 4 – Enhancing Disaster Preparedness for Effective Response To “Build Back Better” in Recovery, Rehabilitation and Reconstruction.....	47
A Further Look Into Multi-Hazard Early Warning Systems	48
6. Stakeholder Analysis	50
7. Impacts and Institutional Response to COVID-19	51
8. Summary of Issues and Gaps	52
9. Priority Areas for Action	53
Addressing Systemic Risk.....	55
10. Conclusion.....	57
References.....	58
Appendix.....	63
Appendix I: Risk Components	63
Risk Components:Vulnerability and Exposure	73

List of Acronyms

ABS	Algemeen Bureau voor de Statistiek / General Bureau of Statistics
ADEKUS	Anton de Kom University of Suriname
ASGM	Artisanal and Small Scale Gold Mining
CARICOM	Caribbean Community
CARPHA	Caribbean Public Health Agency
CDEMA	Caribbean Disaster Emergency Management Agency
CDM	Comprehensive Disaster Management
CERT	Community Emergency Response Team
CSSI	Caribbean Safe Schools Initiative
CWP	Country Work Programme
DRIMS	Disaster Risk Information Management System
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECHO	European Commissions Humanitarian Aid Office
GCCA+	Global Climate Change Alliance Plus Initiative
GDI	Gender Development Index
GDP	Gross Domestic Product
GEF	Global Environment Facility
GII	Gender Inequality Index
GoS	Government of Suriname
HDI	Human Development Index
ICT	Information Communication Technology
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IMF	International Monetary Fund
ITCZ	Inter-Tropical Convergence Zone
ITP	Indigenous and Tribal People
MPI	Multidimensional Poverty Index
MUMA	Multiple Use Management Area
NCCPSAP	National Climate Change Policy, Strategy and Action Plan
NCCR	Nationaal Coördinatiecentrum voor Rampenbeheersing National Coordination Center for Disaster Relief
NDC	Nationally Determined Contribution
NGO	Non-governmental Organisation
NIMOS	National Institute for Environment and Development in Suriname
NMA	National Environmental Authority
OAS	Organization of American States

PAHO	Pan American Health Organization
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
ROM	Ministerie van Ruimtelijke Ordening en Milieu / Ministry of Spatial Planning
SAMOA	Small Island Developing States Accelerated Modalities of Action
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
SFM	Sendai Framework Monitor
SIDS	Small Island Developing State
SoE	State of the Environment
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

Suriname at a Glance



Source:
<https://www.alamy.com/stock-photo-america-south-america-suriname-caribbean-map-atlas-map-of-the-world-147049246.html>

Location	5°51' N 55°12'W
Land Mass	163,820 km2
Climate	Tropical
Population	172,623 (2015)
Languages	Dutch (official) ; Sranan
Human Development Index	0.738 Rank 97 (2019)
Gender Inequality Index	0.436 Rank 105 (2019)
Global Health Security Index	36.5 Rank 100 (2019)
Climate Risk Index	118 Rank 130 (2019)

Executive Summary

Disasters reset the clock on development progress made over years. Cognisant of this and the increasing threats associated with climate change, there is a global thrust towards policy coherence in support of sustainable development objectives. This coherence is driven at the international level by the Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction and the Paris Agreement on Climate Change. As a signatory to these mechanisms, Suriname has undertaken a range of activities that aim to fulfil national commitment under these instruments. For disaster risk in particular, the Sendai Framework calls on countries to develop a multi-societal approach to disaster risk reduction, driven by evidence-based action, strong governance and investment, and underpinned by the principles of building back better. Target E of the Sendai Framework aims to increase the number of countries with disaster risk reduction strategies. For Participating States of the Caribbean Disaster Emergency Management Agency (CDEMA), these strategies are referred to as Country Work Programmes and are in alignment with the four priority areas of the Sendai Framework. This study seeks to inform the development and revisions of critical national instruments including the Country Work Programme, National Adaptation Plan, National Development Strategy, sectoral policies, strategies and plans, and other supporting national instruments for implementation of the 2030 Agenda in Suriname.

This report presents the risk profile for Suriname, exploring hazards, vulnerabilities, exposures and capacities. The review and recommendations will therefore be of particular interest to the stakeholders at the national, subnational, regional and global levels, including state and sectoral entities, private sector organisations, academia, donor agencies, civil society organisations, and other stakeholders interested in understanding the risk environment for Suriname in support of targeted interventions. The issues, needs and gaps within the national framework for disaster risk reduction have informed the recommendations about the priority areas for intervention. The findings of this report should be deliberated through stakeholder consultations to agree upon interventions and further elaborate the activities, timeframes, budgets and indicators for implementation of activities in support of the outcomes.

Suriname's risk profile is dominated by floods. In 2006, the country suffered major flooding that saw approximately 25,000 persons in 150 villages, directly affected. The event was estimated to have cost USD 40 million. More recently, the April 2021 floods affected all ten districts of the country and final costs are yet to be determined. While floods have been the most common hazard occurrence and produces the highest exposure rating¹, other hazards, especially biological ones, constitute the national risk profile. Currently, the country continues on its path to recovery from COVID-19. The public health challenges have been equally matched by the socioeconomic impacts of the virus, widening inequality gaps and exposing underlying vulnerabilities that drive disaster risk. The complex nature of climate change also cannot be forgotten. Climate change not only affects the hydrometeorological risk environment, but also creates and augments environmental and biological hazards that carry cascading impacts across varying areas. Risk management therefore calls for the application of a systems approach that comprehensively explores the interconnected nature of economic, political human and environmental systems².

Suriname's development framework, the National Development Plan 2017-2021, demonstrates national commitment to disaster risk management and climate change action. While climate-related risks are well established, the Plan also recognises anthropogenic hazards, demonstrating recognition of the multi-hazard environment. As the country's development tool, the National Development Plan provides the needed case for directly addressing disaster risk and the underlying social determinants of risk. The Plan commits to the development of a disaster risk reduction strategy for Suriname which shall cover key areas including: risk identification; preparedness and planning; national coordination for response; rehabilitation and reconstruction for "building back better"; and partnerships for technical and financial support. The National Development Plan therefore presents a strong case for the Country Work Programme, providing a meaningful entry point for the implementation of the programme. Suriname's National Climate Change Policy Strategy and Action Plan (2013), its National Adaptation Plan (2020) and Updated

¹ Inform Index for Risk Management. 2021.

² ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report.

Nationally Determined Contribution (2020) further emphasise national commitment to climate change mitigation and adaptation. Suriname's disaster risk management framework is also supported by a designated competent authority through the National Coordination Centre for Disaster Relief (NCCR) and a multi-stakeholder environment involving varying sectors, state agencies, non-governmental organisations, local government and the community.

Notwithstanding progress to date, this study reveals a number of areas for urgent action to strengthen the national framework for disaster risk management. Suriname's disaster risk management approach is largely response-centric, with inadequate mechanisms for risk mitigation and preparedness. Approved and operationalised disaster legislation is absent from the national framework. Moreover, the inadequate legislative environment for development mainstreaming has hindered disaster risk reduction progress. Shortcomings in the legislative and policy environment for disaster risk reduction, have translated into operational and institutional challenges, lending to unclear responsibilities, fragmented activities, and inadequate ownership and mainstreaming. In addition, limited human, material and financial resources to undertake disaster risk management activities have stymied progress. Increasing debt levels have placed a drag on economic growth and development in Suriname, while constraining the allocation of resources for productive and new investments³. Suriname also lacks the resources to effectively collect, analyse, and use data, thus is unable to track progress on reducing climate and disaster risks, and lacks the evidence to make sound future decisions related to development and economic growth. Baseline data and sectoral risk profiles useful for policymakers for developing integrated policies, plans, strategies, and actions (with the exception of a risk profile for the agriculture sector) as well as a comprehensive hazard and disaster risk assessment on national level are also absent. These gaps present challenges to the mainstreaming environment.

Policy coherence also requires strengthening. Despite the availability of the National Development Plan and climate change-specific plans and policies, a disaster risk management policy or plan does not exist. While the existing policy instruments show progress towards strategic, conceptual and operational coherence, institutional, financial and monitoring and evaluating coherence are low. In the context of a low resource setting, financial and

monitoring and evaluating coherence are especially crucial. Institutional coherence is hindered by the segregated ownership across state entities. Whilst the NCCR is responsible for addressing disaster risk management, the role of developing and coordinating the implementation of climate-related policies and plans in Suriname falls under the Directorate for the Environment at the Ministry of Spatial Planning and Environment. The National Development Plan is led by the country's Planning Bureau. There is therefore a need for joint mechanisms to support policy coherence. These challenges, among others are presented throughout the body of this report.

3 Government of Suriname. 2019. National Adaptation Plan.

Priority Areas for Action

The existing gaps, problems, issues and needs have informed the recommendation of five medium term goals (outcomes) for consideration for Suriname's Country Work Programme as well as national and sectoral policies and strategies. The following outlines the priority areas that can significantly enhance national capacity and support the country's development objectives and targets under the sustainable development goals.

Outcome 1-Strengthened governance arrangements for disaster risk reduction.

Outputs:

- 1.1 Disaster risk management legislation revised, approved and operationalised to support disaster risk reduction.
- 1.2 National Comprehensive Disaster Management Policy developed and implemented.
- 1.3 Spatial Planning Act and Policy finalised and operationalised.
- 1.4 National disaster management fund established.
- 1.5 Increased arrangements for risk transfer at the state and subnational levels.
- 1.6 Risk incentives for mitigation measures instituted.
- 1.7 Risk assessments integrated through development planning and a legislative mechanism instituted to restrict development in high-risk zones.
- 1.8 Strengthened arrangements for policy coherence.
- 1.9 Increased investment in the NCCR for disaster risk reduction activities.
- 1.10 Building code enforced for risk mitigation.
- 1.11 National Environmental Act revised and enhanced to integrate disaster risk analyses.
- 1.12 Disaster Risk Financing Strategy developed and instituted with considerations for risk retention and risk transfer measures.

Outcome 2-Enhanced capacity for response, recovery and rehabilitation.

Outputs:

- 2.1 Coordination mechanism for stakeholders formalised through disaster management law and/or policy.
- 2.2 Recovery and reconstruction policy developed and implemented with considerations for building back better.
- 2.3 Critical infrastructure policy and protection strategy developed and operationalised.
- 2.4 Enhanced preparedness for biological hazards and pandemics.
- 2.5 Enhanced Multi-Hazard Early Warning System.
- 2.6 Improved business continuity planning for key sectors and government agencies.

Outcome 3- Increased and sustained knowledge for disaster risk reduction.

Outputs:

- 3.1 Comprehensive national risk database developed and instituted through the DRIMS.
- 3.2 Public awareness and outreach strategy formalised for risk awareness and planning.
- 3.3 Formal training strategy developed and instituted.
- 3.4 Strengthened capacity for data collection, analysis and dissemination for risk-informed action.
- 3.5 Traditional knowledge mainstreamed into disaster risk reduction initiatives.
- 3.6 Disaster risk reduction mainstreamed into education curricula.
- 3.7 Enhanced capacities for risk mapping and modelling.

Outcome 4-Disaster risk reduction mainstreamed into sectors.

Outputs:

- 4.1 Disaster risk reduction strategies integrated into priority sectors.
- 4.2 Sectoral responsibilities for disaster risk reduction mandated through law.
- 4.3 Increased investment for sectoral mainstreaming.

Outcome 5-Strengthened community resilience.

Outputs:

- 5.1 Community involvement in disaster risk reduction formalised through policy and law.
- 5.2 Community early warning systems enhanced and expanded for multiple hazards.
- 5.3 Enhanced arrangements for and inclusion of vulnerable groups including persons with disabilities, the elderly and indigenous and tribal peoples, and considerations for gender.
- 5.4 District disaster plans strengthened with considerations for mitigation, preparedness, response and recovery, and tested.

1. Introduction

Small Island Developing States (SIDS) are among the most vulnerable of countries due to their high exposures to hazards and climate change impacts, open and fragile economies and their limited resource capacities. Against this backdrop, disaster risk reduction strategies are critical to mitigating against these risks and promoting resilient nations in support of development objectives. The COVID-19 pandemic has further underlined national and local vulnerabilities, prompting countries to adopt multi-hazard disaster risk reduction strategies. Target E of the Sendai Framework for Disaster Risk Reduction seeks to increase the number of countries with disaster risk reduction strategies. A country's disaster risk reduction strategy provides a roadmap for reducing risk, strengthening capacity and fostering resilience so countries are better able to mitigate against, prepare for, respond to and recover from disaster impacts. In the case of Caribbean Disaster Emergency Management Agency (CDEMA) Participating States, these are referred to as Country Work Programmes. The Country Work Programme provides a strategic plan for organising Comprehensive Disaster Management (CDM) implementation over a 3-5-year period around each of the phases of the disaster management cycle.

To support countries in meeting the requirements outlined within Target E, the United Nations Office for Disaster Risk Reduction (UNDRR) has provided direct technical support to CDEMA Participating States for the development of situational analyses (i.e. risk profiles) to inform the design and implementation of the Country Work Programmes as well as other national policies and strategies. These risk analyses are underpinned by a systemic risk approach that seek to enhance the alignment with climate change adaptation and sustainable development efforts, and to integrate multiple hazards -including biological ones, into the risk planning process. This report presents the risk profile of Suriname, identifying the hazard context, governance frameworks, vulnerabilities, exposures, capacities and gaps, and is therefore meaningful in informing potential priority areas for the upcoming Country Work Programme, as well as the design and revisions of other critical national instruments including the National Adaptation Plan, National Development Strategy, sectoral policies, strategies and plans, and other supporting national instruments for implementation of the 2030 Agenda. The review and recommendations will therefore

be of particular interest to the stakeholders at the national, subnational, regional and global levels, including state and sectoral entities, private sector organisations, academia, donor agencies, civil society organisations, and other stakeholders interested in understanding the risk environment for Suriname in support of targeted interventions.

1.1 Human and Social Impacts of Disasters

Hazards, when realised, cause great suffering, loss and damages at the individual and community levels, but also to main sectors such as infrastructure (including energy), agriculture, water and forestry, which filter to the community level. Over the years, the people of Suriname have experienced extensive coastal erosion, prolonged dry seasons and flooding that impact lives and livelihoods. The floods in 2006 and 2008 had a significant socioeconomic impact highlighting the population's vulnerability to hydrometeorological events. Both flood events severely affected not only the coastal region but also the interior where a large portion of women are highly dependent on farming for consumption and as a source of income. Over 2300 women are farmers residing within the interior region, when compared to the coastal area that comprises just over 1100 female farmers⁴. During the 2006 floods, approximately 25,000 persons in 150 villages, were directly affected⁵. The floods brought an array of challenges including those related to water availability, sanitation, health concerns including the risk of malaria, and a disruption to critical services including school programmes and telecommunications⁶. In April 2021, there were significant floods again, with all ten districts severely affected. A report by the International Federation of Red Cross and Red Crescent Societies, revealed that at the time, where information was available, some 2000 families were directly affected⁷.

The coastal area is also highly susceptible to flooding and erosion due to sea level rise. Consequently,

4 Ministry of Agriculture, Animal Husbandry and Fisheries. 2008. Suriname's Fifth Agriculture Census.

5 <https://www.ifrc.org/ar/news-and-media/news-stories/americas/suriname/thousands-of-villagers-stranded-in-suriname/>

6 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

7 IFRC. 2021. Suriname: Floods 6/2021. <https://go.ifrc.org/reports/14350>

the loss of stabilisation benefits provided by the mangroves has led to the loss of 27 metres of land in one year, and has caused displacement of local habitants and loss of livelihoods. The local population of more than 3000 and its fisheries, farms, and important religious and cultural sites are at risk to frequent flooding and land degradation⁸. A range of unsustainable and uncontrolled activities, for example inadequate development management, urbanisation and over-harvesting, threaten the mangrove ecosystem. These unsustainable activities combined with the impacts of climate change, place enormous stress on the mangrove ecosystems. Continued loss of mangrove forests will have serious ecological and socioeconomic impacts. These impacts are disproportionately felt by communities who are dependent on mangroves for their livelihood. Mangrove forests provide important goods and services, including income and food security for forest communities⁹. However, when these ecosystems are damaged or destroyed, the impacts are felt at the community level.

Strong wind events have also affected communities over the years and is a relatively common occurrence in districts such as Commewijne, damaging homes and property¹⁰. Technological hazards, though less common than hydrometeorological hazards in the country profile, have brought social impacts. In 1969, a major plane crash at the Zanderij International Airport resulted in almost everyone on board killed, with a fatality count of 176 persons¹¹. Air traffic accidents still characterise the national risk context. More recently, in 2008 and 2010, respectively 19 and 8 lives were lost from accidents. The social impacts of these hazard occurrences also affect psychological health, with hazard occurrences often leaving persons with feelings of trauma, anxiety and depression. These effects are more difficult to quantify but must not be forgotten when considering the social implications of disasters.

1.2 Economic Impact of Disasters

Suriname's main contributors to gross domestic product (GDP) include the services sector, industry (including mining), and agriculture. Historically, extractive industries¹² have accounted for around 30% of GDP and as much as 90% of exports. Agriculture is also important in the economy, accounting for around 10% of GDP. Recent offshore oil discoveries in Suriname will increase its dependency on the oil industry. After an average growth of 4.4% for the period 2004-2014 with declining poverty levels and a per capita income of its population with a peak in 2014 of nearly USD 9400, the economy collapsed at the end of 2015 due to the decrease in international oil and gold prices. GDP contracted severely, leading to increased poverty levels and rising central government debt. While the country's economy is still struggling to recover from the 2015 recession, another financial crisis occurs. Due to inadequate policy buffers, a buildup of macroeconomic risk and the ongoing COVID-19 pandemic, the country experienced another deep recession in 2020¹³. Estimation from the International Monetary Fund (IMF) shows that real GDP contracted by 13.1% in 2020 and the debt to GDP ratio increased significantly from 18.5% of GDP in 2010 to 123% of GDP as of June 2020 (Figure 1)¹⁴. The government has requested financial support from the IMF for the 'Crisis en Herstelplan' (Crisis and Recovery Plan), an economic plan aimed at tackling the country's macroeconomic vulnerabilities and putting Suriname back on a path of strong, sustained, and equitable growth.

8 www.cis.org

9 NIMOS, SBB and UNIQUE. 2017. Background study for REDD+ in Suriname: Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. Paramaribo, Suriname.

10 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

11 Schmeitz, Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

12 Including bauxite, which used to be a highly important extractive industry before alumina production and exports ceased in 2015.

13 Khadan, Jeetendra. 2020. Suriname in Times of COVID-19: Navigating the Labyrinth. Inter-American Development Bank.

14 Khadan, Jeetendra. 2021. Weblog Strengthening Economic Institutions to Support Suriname's Public Finance. Inter-American Development Bank.

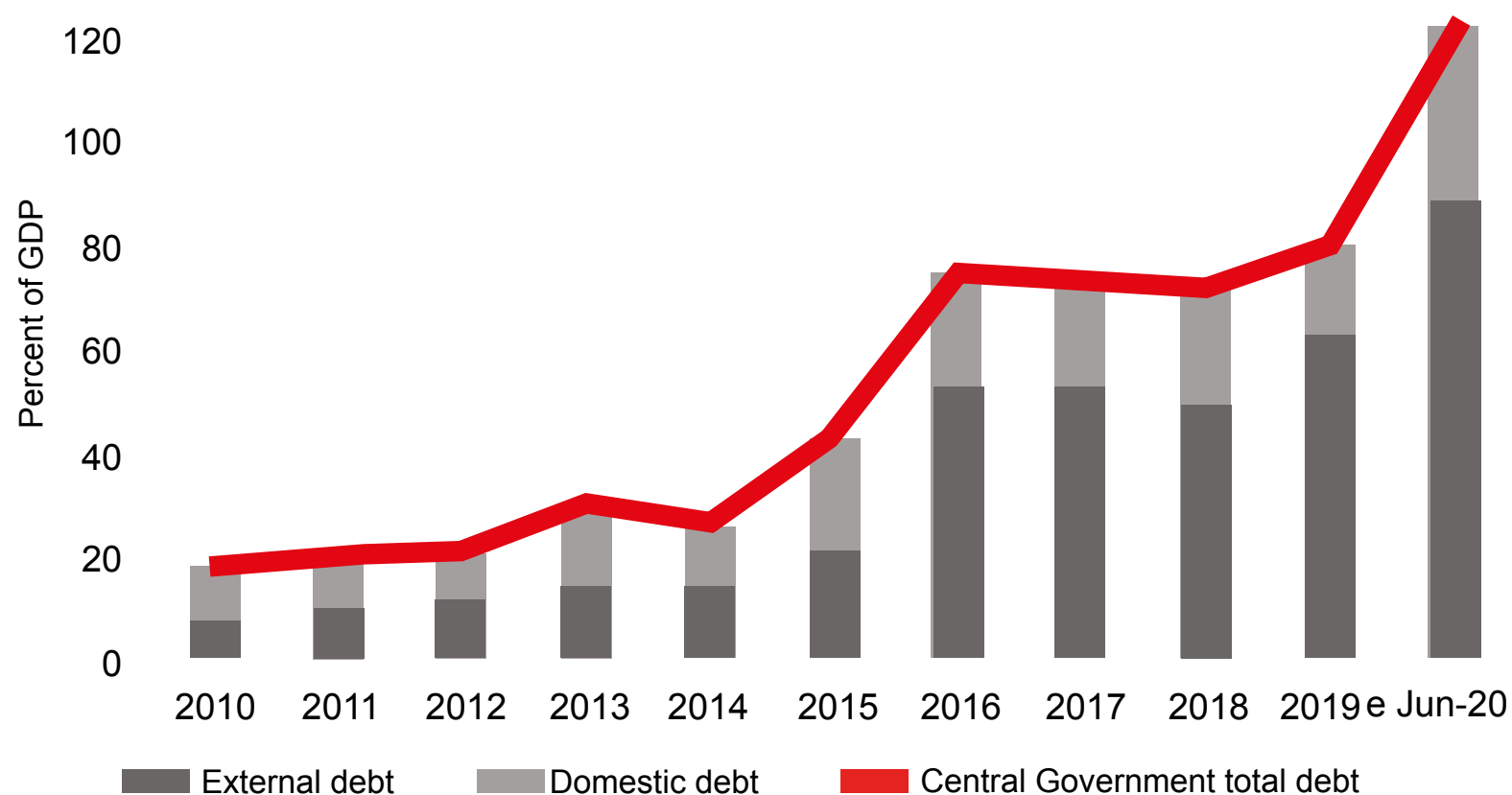


Figure 1: Percentage of GDP over years 2010-2020. Source: Ministry of Finance and Planning, Suriname

The country's natural and human geographies also result in increased hazard exposure that can generate debilitating economic impacts. Suriname's small population, major economic activities, and infrastructure are concentrated along the low-lying coast. Exposure to coastal hazards creates risks for fiscal and macroeconomic stability, private investment in productive activities, sustainable growth and poverty reduction. The country has already experienced extensive coastal erosion, and has suffered damages from heavy rainfall, flooding, and high winds.

Over the past decades, Suriname has experienced a number of hydrometeorological disasters mostly due to strong winds and flooding, of which the severe disasters in 2006 and 2008 led to far reaching consequences in all key sectors of the country's economy. The two major floods in 2006 and in 2008 affected not only the interior, but also the coastal region where the majority of Suriname's agricultural activity is concentrated. An assessment of the socioeconomic impact of the May 2006 floods showed that in a few days 2.3% percent of GDP at the time was lost due to the floods, with the largest proportion of damage reported in the education sector with 45% and agriculture with 39% of the monetary total damage¹⁵. During the 2008 floods, damage to the agriculture sector was considerable. Approximately 30% of the livestock, 65% of crops and

90% of the fishing industry were affected¹⁶. Table 1 provides an overview of the social and economic impacts some of the aforementioned disasters and estimated damage.

Year	Number of People affected	Estimated Damage (in SRD and USD)
2006	25000	USD 40 million
2008	6548	-
2015	210	SRD 900,260
2016	69	SRD 221,454
2017	52	SRD 191,155
2018	21	SRD 14,450
2019	73	SRD 187,537

Table 1: Number of people affected and estimated damage¹⁷

¹⁵ World Bank. 2019.

¹⁶ <https://www.gfdr.org/en/suriname>

¹⁷ Algemeen Bureau voor de Statistiek (ABS). 2018. 8th Environmental Statistics Publication. Paramaribo, Suriname

1.3 Social Demographic Characteristics

With a population of about 541,638 persons¹⁸, Suriname is one of the least populous country in the world with an average low population density of approximately 3.65 people per square kilometre¹⁹, although density is higher in urban areas. Suriname is divided in ten districts scattered over two main geographic regions. The northern coastal area is where the majority of the ethnically diverse population resides in most of the districts. About 90% of the Suriname's population live in the 384 km long young coastal plain, and two thirds of that in the urban area consisting of the capital district Paramaribo (44%) and district Wanica (22%)²⁰. The southern area consist mainly of tropical rainforest and a sparsely populated savannah along the Brazilian border. The remaining population is scattered over the savanna belt-Zanderij formation and the interior and consist mostly of Indigenous and Maroon tribes (Figure 2). At least 15 different languages are spoken, including: six Indigenous languages while Dutch is the official language of Suriname and Sranan Tongo is the lingua franca.

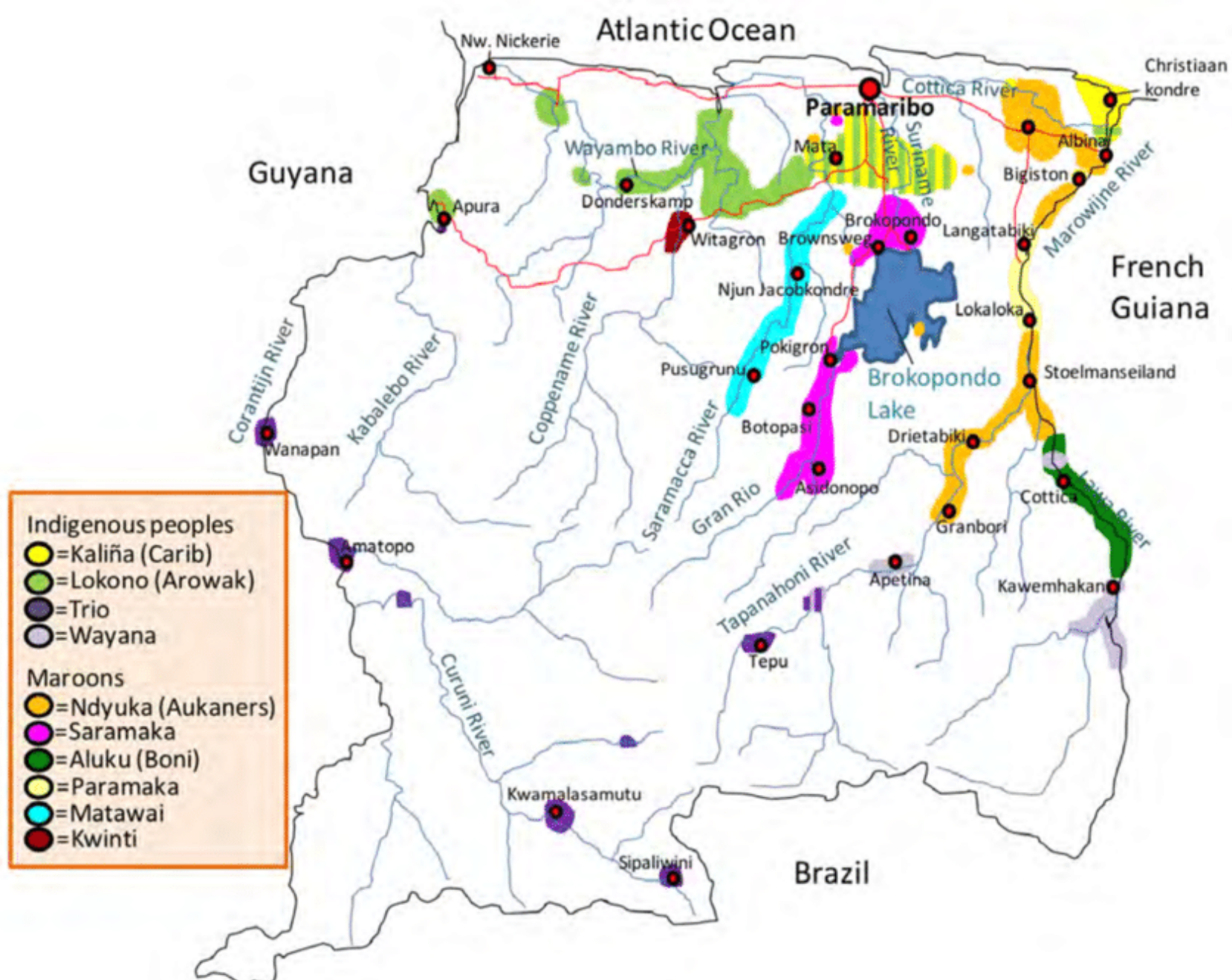


Figure 2: Map of Suriname with the approximate living areas of the various indigenous and maroon groups and some of the main communities

Suriname's urbanisation rate is approximately 1% (2010-2015) and current population projections estimate an increase in the total population to 2.5 million people by the end of the century with projected increases in Paramaribo and Wanica²². It is estimated that over 50% of the workforce of Greater Paramaribo and Wanica is located in the city centre. There are over 200 villages across the interior of Suriname with an estimated population of less than 15% of total population. Many of these villages are only accessible by plane or boat, presenting accessibility challenges. Road infrastructure in the hinterland is overall limited to roads that serve the mining industry.

¹⁸ Algemeen Bureau voor de Statistiek (ABS). 2013. Suriname Census 2012.

¹⁹ Algemeen Bureau voor de Statistiek (ABS). 2020. 9th Environmental Statistics Publication. Paramaribo, Suriname.

²⁰ Algemeen Bureau voor de Statistiek (ABS). 2020. 9th Environmental Statistics Publication. Paramaribo, Suriname.

²¹ Source: WorldBank, 2019

²² Government of Suriname (2020), Suriname National Adaptation Plan 2019-2029

Population Per District

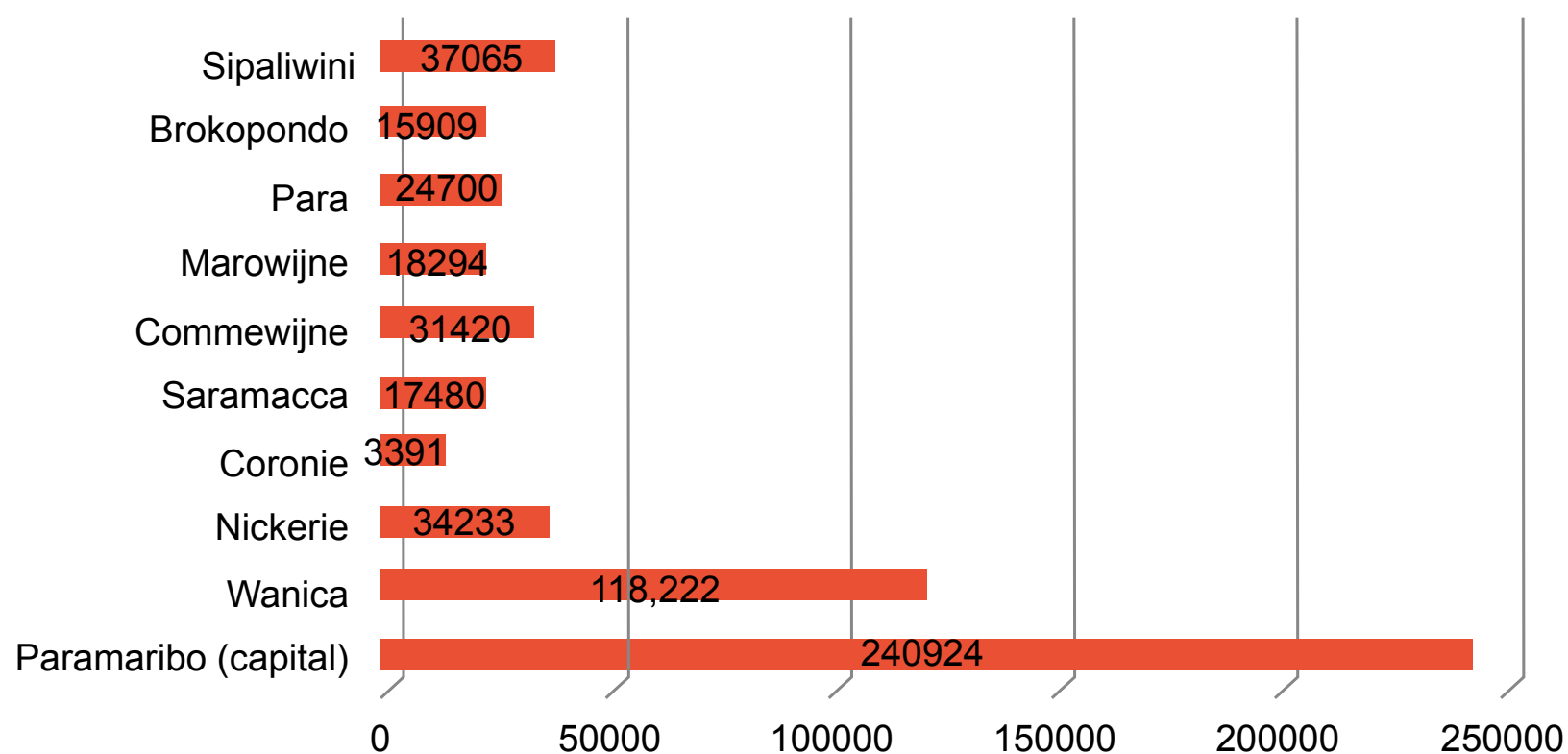


Figure 3: Population by District in Suriname

In 2019, Suriname's Human Development Index produced a value of 0.738, ranking 97 of the 189 countries below the average of 0.766 for countries in Latin America and the Caribbean²³. This puts Suriname at a similar level of development as Belize and Dominica. Between 2005 and 2019, Suriname's HDI value increased from 0.686 to 0.738, an increase of 7.65. Table 2 presents Suriname's progress in each of the HDI indicators. Between 1990 and 2019, Suriname's life expectancy at birth increased by 4.2 years, mean years of schooling increased by 1.6 years and expected years of schooling increased by 1.3 years. In 2019, life expectancy maintained a steady increase, at 71.7. The 2019 female HDI value for Suriname is 0.729 and 0.740 for males, resulting in a Gender Development Index (GDI) value of 0.985, placing it into Group with high equality in HDI achievements between women and men, signifying the country's strides in gender equality. Despite this, the HDI Report also revealed a Gender Inequality Index (GII) value of 0.323 of 0.436, ranking it 105 out of 162 countries in the 2019 index.

Year	Life expectancy at birth	Expected years of schooling	Mean years of schooling	GNI per capita (2017 PPP\$)	HDI values
1990	67.4	11.9		12,347	
1995	67.7	11.5		11,328	
2000	67.8	11.0		11,604	
2005	68.9	11.4	7.7	14,383	0.686
2010	70.5	12.2	7.07	16,908	0.710
2015	71.2	12.9	9.0	17,719	0.740
2016	71.4	12.9	9.1	15,663	0.735
2017	71.5	12.9	9.1	14,336	0.732
2018	71.6	12.9	9.1	14,571	0.734
2019	71.7	13.2	9.3	14,324	0.738

Table 2: Contribution of each component index to Suriname's HDI since 2005²⁴

²³ UNDP, Human Development Report 2020.

²⁴ United Nations Development Program (UNDP). 2020. Human Development Report 2020

1.4 Natural and Landscape Characteristics

Located on the South American land mass, south of the Atlantic Ocean, east of Guyana, west of French Guiana, Suriname has a unique position within the Latin American and Caribbean countries as it is one of the world's countries with highest forest cover and lowest deforestation rates. The interior of Suriname is predominantly covered with forest that are part of the Amazon Biome, the largest tropical rainforest on earth, which houses at least 10% of the world's known biodiversity²⁵. Suriname at regional level, is part of the Guiana Shield tropical forest ecosystem, one of the largest contiguous and relatively intact forested ecoregions of the world²⁶. Surinamese forests host significant levels of biodiversity, which can be attributed not only to this significant forest cover, but also the large variety of habitats, temperature, and relatively low population pressures to date.



Figure 4: Physical Map of Suriname²⁷

The country can be divided in a swampy coastal plain, a central plateau region containing broad savannahs and swamp forest, and to the south a mountainous region densely forested with tropical rainforest. Figure 5 depicts the areas based on geomorphological differences such as the young coastal plain (situated between 0 and 4 meters above sea level), the old coastal plain (4-11 meters above sea level), the savanna belt-Zanderij formation (10 meters above sea level) and the interior. The country possesses seven types of ecosystems:

²⁵ WWF, 2017: http://wwf.panda.org/what_we_do/where_we_work/amazon/about_the_amazon/

²⁶ NIMOS, SBB and UNIQUE (2017). Background study for REDD+ in Suriname: Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. Paramaribo, Suriname.

²⁷ Source: <https://www.ezilon.com/maps/south-america/surinam-physical-maps.html>

- (i) marine ecosystems (Atlantic Ocean, mud banks, sandbanks, mudflats);
- (ii) coastal ecosystems (mangrove forests, mangrove swamps);
- (iii) brackish water ecosystems (brackish water pans and lagoons);
- (iv) freshwater ecosystems (freshwater swamps, open freshwater systems such as the Brokopondo Lake, upper rivers and rapids in the interior);
- (v) savannah ecosystems (white and brown sand savannahs, rock savannahs);
- (vi) marsh ecosystems and
- (vii) tropical rainforest and inselbergs

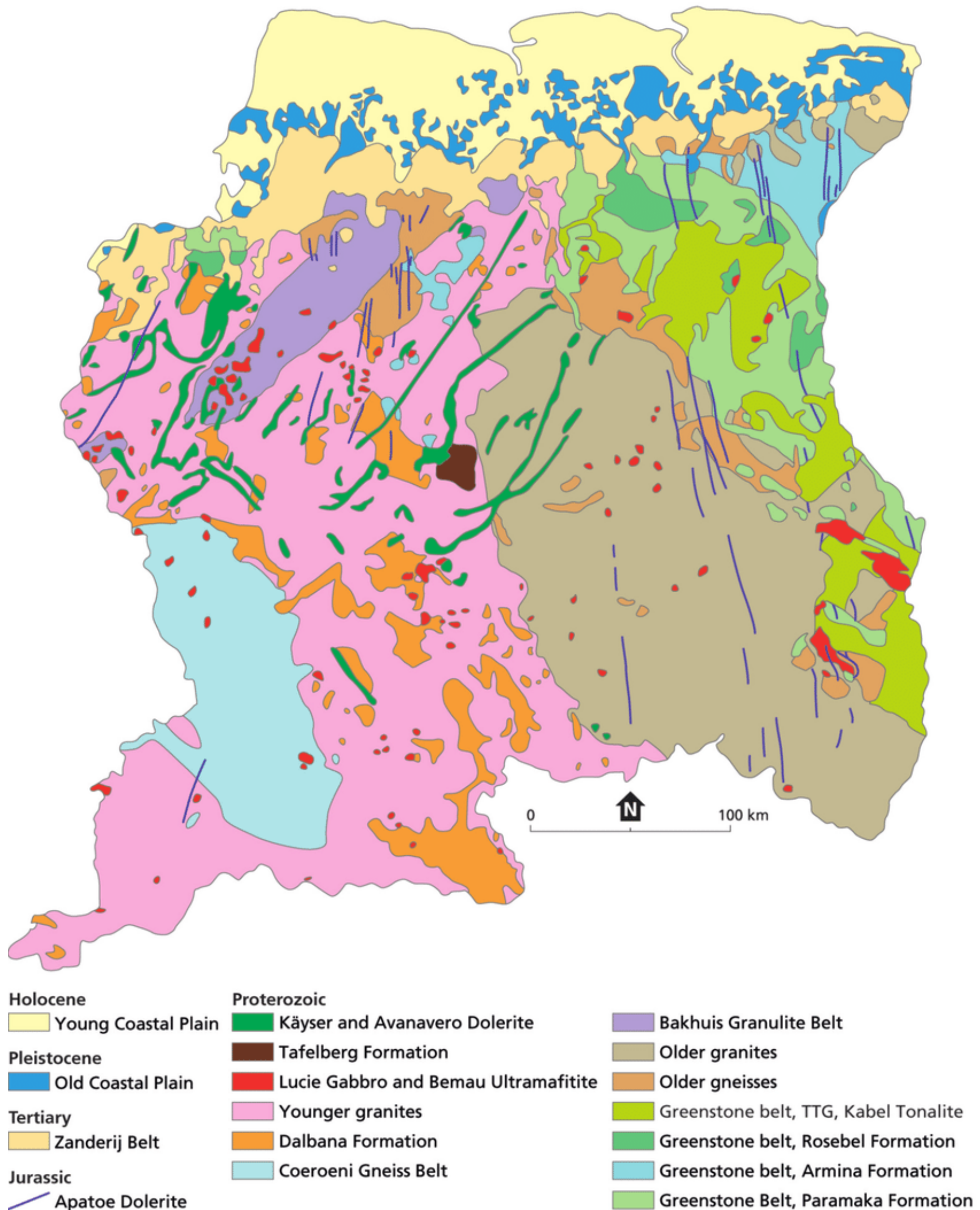


Figure 5: Geological sketch map of Suriname ²⁸

²⁸ Algemeen Bureau voor de Statistiek (ABS). 2020.

Suriname has a long history of protecting the biological diversity in these ecosystems. Starting in 1954, sixteen protected areas were established consisting of eleven nature reserves, four Multiple Use Management Areas (MUMAs) and one nature park. Together they make up about 2.3 million hectares or 14% of the country's land surface²⁹. Mangrove forests in Suriname currently cover a total area of about 80,500 hectares. They occur along almost the entire length of the coastline of Suriname and along the main rivers and tidal creeks, reaching from the estuaries to brackish areas further upstream. Scattered pockets of mangrove vegetation also occur among the brackish swamps behind the mangroves and provide tremendous benefits to livelihoods and risk reduction. The coastline is highly dynamic and characterised by cyclical accretion and erosion.

The country has a tropical climate with a more or less uniform temperature and high humidity (80-90%), which is influenced by the Inter Tropical Convergence Zone (ITCZ). Suriname experiences two dry seasons and two rainy seasons and precipitation amounts vary by season and across the country. Variation in monthly rainfall results in two wet and two dry seasons in the northern part of Suriname. In the southern part, only one wet and one dry season are distinguished. The northern part of the country receives between 1750-1800 millimetres of rainfall annually and the southern part receives approximately 2400 millimetres annually. The average daily temperature in the coastal region is 27.6°C, with an average daily variation of 4°C. There is relatively little variation in temperature between the seasons in the coastal region. January is the coldest month (with an average temperature of 27.5°C) and October is the warmest (with an average temperature of 29.2°C). Thus, annual variation of the average temperature is 2-3°C. The interior has relatively similar figures, with an even smaller annual variation of average temperatures.

Winds in Suriname generally move in a northeasterly direction. Maximum average wind speed ranges from 30-42 km/h on the coast to about 30 km/h in the interior. Wind is highest during the dry seasons, with up to 40 km/h in March and a second stronger peak in September and October. Wind speeds are relatively high along the seashore and decrease as one moves inland. Wind speeds of 20 to 30 km/h generally occur during the day and drop dramatically during the evening and night, especially in the interior. Suriname lies outside of

the hurricane belt, however, the country's weather is occasionally affected by hurricane tails. Local gales (called sibibusi) occur before storms, generally at the end of the rainy seasons. Sibibusi occur over the entire country and may destroy trees and houses. On average, this occurs less than three days a year. Strong winds are more frequent and can happen up to 100 days a year in the coastal region.

²⁹ As recorded by Stichting voor Bosbeheer en Bostoezicht (SBB). In English: Foundation for Forest Management and Production Control

2. Disaster Risk Profile

The Inform Risk Index (2021) examines three dimensions of risk: hazard and exposure, vulnerability and lack of coping capacity and ranks Suriname as 108 out of 191 countries and an overall risk category of low (3.1³⁰) in 2021³¹. The Hazard and Exposure dimension assesses elements of natural and anthropogenic hazards and produces a score of 2.2 (low) out of 10. The Vulnerability dimension evaluates a country's economic, political and social characteristics that can be destabilised in the event of a hazard occurrence and gives a score of 2.7 (low) for the country. Lack of coping capacity, which lends to vulnerability, looks at the governance arrangements that aid in reducing disaster risk, producing a value of 5.0 (medium). Notwithstanding the overall low risk rating, the recent 2021 floods and the threat of COVID-19 serve as a reminder to the existing risk realities.

2.1 Hazards

A hazard can be defined as "A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation."³² The subsequent paragraphs present the main hazard context for Suriname. Appendix I identifies the full range of hazards grouped into the eight overarching hazard clusters prescribed by the United Nations Hazard Definition and Classification Review Technical Report (2020).

Hydrometeorological hazards are the most common occurrences affecting the country. Although Suriname lies outside the Atlantic hurricane belt, it sometimes experiences rainfall and winds brought on by outer band activities and atmospheric disturbances created by tropical cyclones, especially within its coastal region which borders the Atlantic Ocean. The country is mainly affected by coastal and inland flooding, and many of the disasters in Suriname have been exacerbated by climate change. Drought is a major concern for the country, particularly regarding the agriculture sector. Historically, the climate has had an important impact on Surinamese agriculture. In Commewijne, North Marowijne and Wanica, the absence of the small rainy season in 1957/58 and in 1963/64 contributed to the rapid decline of agriculture³³.

The April 2021 floods affected not only, in the coastal area but also in the interior leading to disruption in services and damages in assets and infrastructure. These floods affected all ten districts of the country³⁴. Villages and communities were inundated for weeks, The 2006 and 2008 floods were also some of the most significant hazard events to have affected the country in recent history. In May 2006 excessive rainfall caused two weeks of sustained flooding by the Tapanahony, Saramacca and Suriname rivers in the interior of Suriname (in the districts of Brokopondo and Sipaliwini). In some areas, the rivers' water levels remained high for three to six days. The floods were so severe, the President declared a state of emergency in the area of Upper Suriname. The 2006 flood caused loss and damage of approximating USD 40 million. The indigenous and maroon villages are traditionally near the riverbanks and their closely located agriculture plots were significantly affected by the heavy rainfall and flooding. The agriculture plots were largely lost and food aid had to be delivered from the capital Paramaribo despite the limited transport and communication links between the capital and the interior, and limited post-disaster resources.

Environmental degradation is an ongoing challenge, especially in the interior which is characterised by mining and deforestation. Mining activities are the main drivers of deforestation in the country³⁵. Between 2000 and 2015, gold mining, particularly artisanal small scale gold mining (ASGM), accounted for 73% of total deforestation over the country (59,554 hectares), and 95.9% of the mining-induced deforestation³⁶. Between 2008 and 2014, gold mining induced deforestation in Suriname doubled as compared to the 2001-2008 period³⁷. Due to underdeveloped regulatory frameworks, the indigenous peoples and the maroons who live in large proportions in the interior are increasingly vulnerable to pressures on land and resources from mining and logging activities. Most artisanal small-scale gold mining are undertaken in creek valleys,

30 Inform Risk Index Values: 0 –2: Very Low 2.1–3.5: Low 3.6–5: Medium 5.1–6.5: High 6.6–10: Very High

31 Inform Index for Risk Management. 2021.

32 UNDRR. 2020. Hazard Definition & Classification Review.

33 Ministry of Agriculture, Livestock and Fisheries. 2019. Agriculture Disaster Risk Management Plan.

34 <https://reliefweb.int/disaster/fl-2021-000068-sur>

35 Government of Suriname. 2018. Forest Reference Emission Level for Suriname's REDD+ Programme. Paramaribo, Suriname.

36 Data from the SBB (Foundation for Forest Management and Control - Stichting Bosbeheer en Bostoezicht), and from LULC working session 2016.

37 Rahm M., Jullian B., Lauger A., de Carvalho R., Vale L., Totaram J., Cort K.A., Djojodikromo M., Hardjoprajitno M., Neri S., Vieira R., Watanabe E., do Carmo Brito M., Miranda P., Paloeng C., Moe Soe Let V., Crabbe S., Calmel M.. 2015. Monitoring the Impact of Gold Mining on the Forest Cover and Freshwater in the Guiana Shield. Reference year 2014. REDD+ for the Guiana Shield Project and WWF Guianas.

and on lower hill slopes, thus contaminating creek forest which subsequently flow into the main rivers. Many rivers and creeks that once provided water that was suitable for human consumption are now deemed unsuitable, and the fisheries that resided in them have gradually disappeared. These conditions create cascading impacts such as those on health. In the dry season, when rainwater is scarce, diarrhea and other waterborne diseases, including malaria, are on the increase in ASGM areas³⁸.

Heavy land degradation occurs after mining operations are over and open mining pits are left behind. Mining activities can increase the risk on landslides. In 2010 a landslide at a mining pit in a remote part of eastern Suriname killed at least seven people who were illegally digging for gold³⁹. One of the most striking man-made disasters to have occurred in Suriname was the cyanide spill in the Rosebel Gold Mine in the Brokopondo district in 2005. A breach in the wall of the pond used to store cyanide effluent resulted in millions of litres of cyanide entering the Saramacca River and killing many fish. Apart from the risk of repetition in the Rosebel mine, this could also happen in the Newmont Merian mine in the Marowijne district, where cyanide is also used on a large scale⁴⁰. With the planned near-shore oil drilling and off-shore oil drilling by international exploration companies, the risk of oil spill has increased, with possible consequences for the marine environment, fish populations, coastal communities⁴¹. Other chemical hazards include the risks associated with pesticides which are common in the agriculture sector⁴².

Suriname is highly vulnerable to the impacts of climate change. These include sea level rise, high winds, changes (increases and decreases) in precipitation, sediment discharge from the Guyana current and higher temperatures. Other possible impacts that Suriname faces due to climate change are droughts and crop loss, biodiversity loss and increased landslides in the interior⁴³. The coastal region of Suriname is within a few metres above mean sea level and is therefore susceptible

to coastal flooding. High winds in combination with sea level rise can lead to increased waves which can exacerbate coastal erosion. Mangroves, covering only a 0.5% of Suriname's land surface, plays a crucial role as a natural sea barrier in the low-lying coastal area. Mangroves protect the marine ecosystem and defend the shoreline from erosion in the face of sea level rise and soil erosion. However, this ecosystem is threatened by a range of unsustainable and uncontrolled activities that often damage the ecosystem. Unsustainable practices combined with the impacts of climate change, place enormous stress on the mangroves ecosystems and threaten the resilience of the coastal communities against the effects of climate change.

For past decades, Suriname is frequently witnessing negative effects of climate change, such as increases in precipitation causing floods both in the coastal regions as well in the interior. Floods in Suriname's coastal regions are a product of intense rainfall (in combination with insufficient drainage), sea-level rise, particularly during spring tide and storm surges. These hazards result in the loss and damage of land and assets such as electricity poles, roads, bridges, buildings, and transmission lines, but also human lives either directly or indirectly via floods, fires, coastal and riverbank erosion⁴⁴. Sea-level rise and storm surges cause coastal erosion, flooding of coastal areas and saltwater intrusion especially in the districts of Coronie and Nickerie.

The UNISDR's (now UNDRR) classification by mortality risk for Suriname shows that the most significant natural hazard for the country are floods which can be exacerbated by climate change and will cause major losses in the future. The mortality risk index is based on hazard modelling (tropical cyclones, flooding, earthquakes and landslides), taking into account the frequency and severity of the hazard events, human exposure, and vulnerability. Figure 6 shows that relative values indicate that mortality risk is concentrated at a medium-high level due to floods and the absolute mortality risk (average deaths per year) shows that floods are classified as medium-low.

Although all districts are vulnerable to one or more

38 Heemskerk, M. and Oliveira, M. 2003. Perceptions of small-scale gold mining impacts: Results from focus group discussions in mining camps and affected communities. Tapanahonie & Brokopondo Regions, Suriname.

39 <https://www.starnieuws.com/index.php/welcome/index/nieuwsitem/3490>

40 Ministry of Agriculture, Livestock and Fisheries. 2019. Agriculture Disaster Risk Management Plan.

41 Ibid.

42 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

43 Worldbank. 2017. Paramaribo Strategic Flood Risk Assessment.

44 Noordam, D. 2007. Promotion of Sustainable Livelihood within the Coastal Zone of Suriname, with Emphasis on Greater Paramaribo and the Immediate Region. Ministry of Labour, Technological Development and Environment.

45 IDB. 2018. Indicators for disaster risk and risk management. Program for Latin-America and the Caribbean: Suriname.

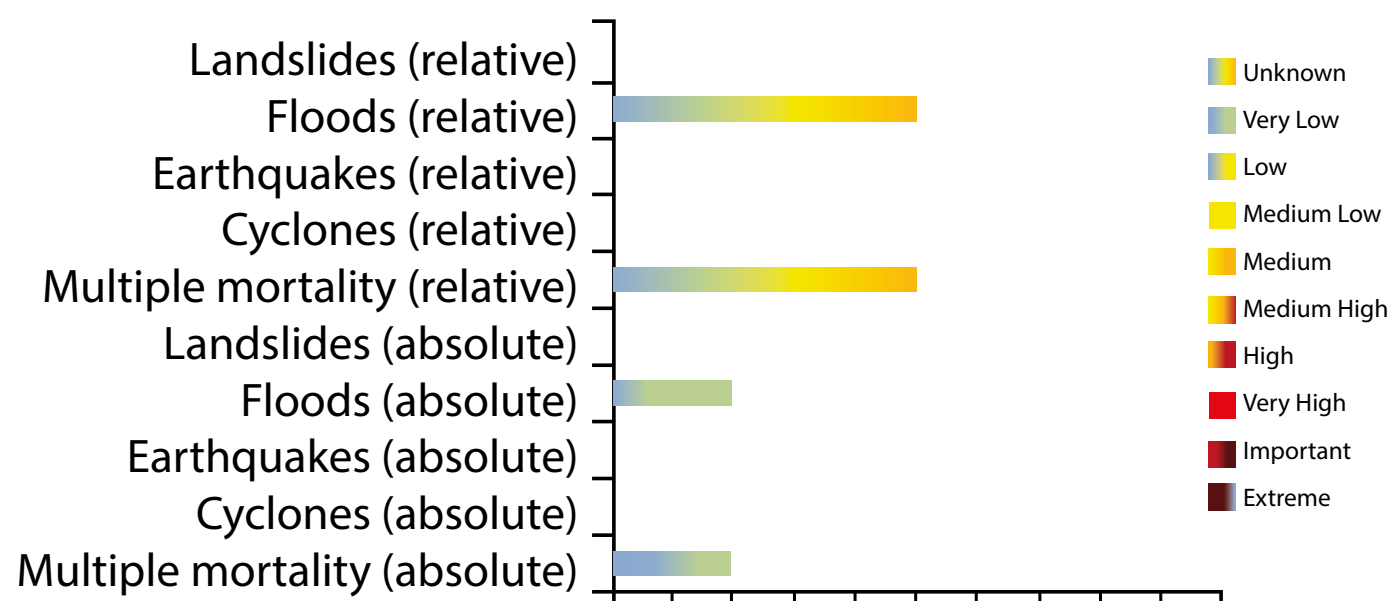


Figure 6: Classification by mortality risk⁴⁵

hazards, the low-lying flat coastal zone is most susceptible to threats from floods, salinisation, diseases and pests, strong winds and chemical spills. For inland areas, these are floods and droughts as well as chemical spills. Overall, flood risk is considered to be the most significant for human life and food supply in Suriname. This is further reflected in the Inform Risk Index which recognises flood risk exposure as the greatest. This issue is widely acknowledged and placed on the political agenda, and over the years some protective measures have been taken, both structural and non-structural.

Geological hazards are less common although earthquakes remain an uncommon but present risk. The 2021 Inform Risk Index produces a very low value of 0.1 for earthquake exposure for Suriname. Nearby seismicity has occurred three times in the last 100 years with magnitudes ranging between 2.8 – 3.0⁴⁶. Tsunami risk is however, higher, producing a value of 3.2 in the Index while floods carry a value of 8.6.

Vector-borne diseases are also very common, with the Index producing a value of 7.9. Food and water-borne illnesses, while present, produce a value of 3.3. Dengue viruses, malaria, Zika and Chikungunya have been observed in varying districts over the years⁴⁷. The ongoing COVID-19 pandemic is an urgent reminder of the need for deliberate and comprehensive efforts to address biological hazards. As at April 11, 2022, the country has recorded a total of 79,241 and 1325 deaths. Naturally, the country's capital has seen the highest numbers of positive cases. The Inform COVID-19 Risk Index

that aims to identify "countries at risk from health and humanitarian impacts of COVID-19 that could overwhelm current national response capacity, and therefore lead to a need for additional international assistance," places Suriname at a rating of 3.6 i.e. Medium Risk, indicating there is much needed improvement to build country capacity to manage pandemics at large.

Technological hazards, though less common than hydrometeorological hazards, constitute the risk profile. In 1969, a major plane crash at the Zanderij International Airport resulted in almost everyone on board killed, with a fatality count of 176 persons⁴⁸. Air traffic accidents still characterise the national risk context. More recently, in 2008 and 2010, respectively 19 and 8 lives were lost from accidents. Societal hazards, while evident, are less recognised as main hazards facing the country. The financial crisis of 2015 created significant economic fallout, driving the economy into a sharp recession at the time⁴⁹. Between 1986 and 1992, civil war broke out between the maroons and the army⁵⁰. Hundreds of citizens and military personnel were killed. The disruption resulted in the damage and destruction of interior assets including roads, schools, health facilities and electricity and water infrastructure⁵¹. Consequently, violence and civil unrest must not be forgotten from the national risk context.

46 <https://www.volcanodiscovery.com/earthquakes/suriname/largest.html>

47 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

48 Schmeitz, Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

49 Khadan, Jeetendra. 2020. Suriname in Times of COVID-19: Navigating the Labyrinth. Inter-American Development Bank.

50 <https://humanityhouse.org/en/rampen-conflicten-suriname-binnenlandse-oorlog-1986-1992/>

51 Bijnaar, Aspha E. 2008. NWIG: New West Indian Guide / Nieuwe West-Indische Gids 82, no. 1/2: 177-79.

Hydrometeorological	<ul style="list-style-type: none"> Flood, storm surge, tsunami, wind events, drought
Extraterrestrial	<ul style="list-style-type: none"> Not considered in plans and policies
Geological	<ul style="list-style-type: none"> Tsunami, landslide
Environmental	<ul style="list-style-type: none"> Land and soil degradation, biodiversity loss, deforestation, air pollution, loss of mangroves, wildfires, sea level rise coastal and soil erosion
Chemical	<ul style="list-style-type: none"> Oil pollution, asbestos, persistent organic pollutants
Biological	<ul style="list-style-type: none"> Invasive species, human/animal infectious diseases
Technological	<ul style="list-style-type: none"> Contamination, explosions, leaks, spills, fire, mining hazards oil and gas extraction hazards, infrastructure failure, water supply failure, radio and telecommunications failure, power outage
Societal	<ul style="list-style-type: none"> Civil unrest, violence, financial shock

Figure 7: Summary of documented hazards for Suriname under the United Nations Hazard Definition and Classification Review Technical Report, 2020

2.2 Vulnerability

2.2.1 Social Vulnerability

“Social vulnerability refers to the inability of people, organisations, and societies to withstand adverse impacts from multiple stressors to which they are exposed⁵².” Social vulnerability considers the socioeconomic and demographic factors that determine individuals’ abilities to cope with hazards. This is essential as oftentimes, the socially vulnerable are significantly disadvantaged in disaster situations and as such are more adversely affected⁵³. Factors such as income/poverty, gender, age, disability, literacy, and household circumstances contribute to the vulnerability landscape.

Poverty is perhaps the leading determinant of vulnerability. Poverty not only results in reduced financial capacity for reducing physical vulnerability and exposure, but also is exacerbated in the aftermath of disasters. These groups are often unable to access social support mechanisms due to

their marginalisation while also lacking appropriate risk transfer mechanisms to stimulate recovery. Estimates place the poverty rate around 26.2% in 2016-2017⁵⁴ with the rate much higher at 51.7% in the rural interior and a further 13.1% vulnerable to poverty⁵⁵. Figure 8 presents the distribution of those in poverty and vulnerable to being in poverty throughout Suriname. Poverty and the lack of access to labour markets, and therefore access to income, limits the ability of particularly rural interior populations to access food and other basic needs outside of their immediate communities. These pre-existing vulnerabilities are compounded in the face of climate-related or other shocks⁵⁶.

Suriname’s Multidimensional Poverty Index (MPI) is based on the most recent survey data (2018). The MPI identifies multiple overlapping deprivations suffered by individuals in the dimensions of health, education and standard of living. In Suriname, 2.9% of the population (16,000 people) were considered

⁵² UNDP. New York.

⁵³ Flanagan et al. 2011. A Social Vulnerability Index for Disaster Management.

⁵⁴ Estimate based on Inter-American Development Bank (IDB) with Electricity Company of Suriname, the Central Bank of Suriname, and other partners who conducted a Survey of Living Conditions in 2016/2017.

⁵⁵ Ibid.

⁵⁶ Khadan, Jeetendra. 2020. COVID-19: Socio-economic implications on Suriname May 2020. Inter American Development Bank (IDB).

multidimensionally poor while an additional 4% were classified as vulnerable to multidimensional poverty (23 thousand people). The breadth of deprivation (intensity) in Suriname, which is the average deprivation score experienced by people in multidimensional poverty, is 39.4%. The MPI, which is the share of the population that is multidimensionally poor, adjusted by the intensity of the deprivations, is 0.011. Analysis based on the MPI also shows that the Indigenous and Maroons in the interior suffer much higher levels of deprivation of material goods and social services⁵⁷.

Directly related to poverty is the issue of unemployment and underemployment. Data from the World Bank suggests that in 2016, the unemployment rate was 7.92%⁵⁸. A recent publication by the Inter-American Development Bank (IDB) posits that employment in all economic sectors will continue to see declines due to the COVID-19 pandemic including mining (gold and oil), tourism and hospitality, construction and transport. The most vulnerable will be the services and sales workers and unskilled labourers in agriculture, forestry, fisheries and mining, which were found to account for almost a third of the labour force⁵⁹.

The 2016-2017 Survey of Living Conditions collected data on people with disabilities, finding that 45,354 people in Suriname (9.2%) have a disability and that there are more women than men with a disability. This number might be even higher as parents or caregivers may not declare or register children with disabilities. Data showed that most people have one or two disability of which difficulty in seeing and walking are most common. Analysis shows that people with disabilities tend to have lower levels of education than those without disabilities⁶⁰. The number of children with at least one disability is the highest in Sipaliwini district, followed by Wanica and Paramaribo. The Ministry of Social Affairs and Public Housing is responsible for providing financial support to persons with disabilities in the form of a monthly grants. However, there is no specific policy or support programme for these persons in the case of disasters.

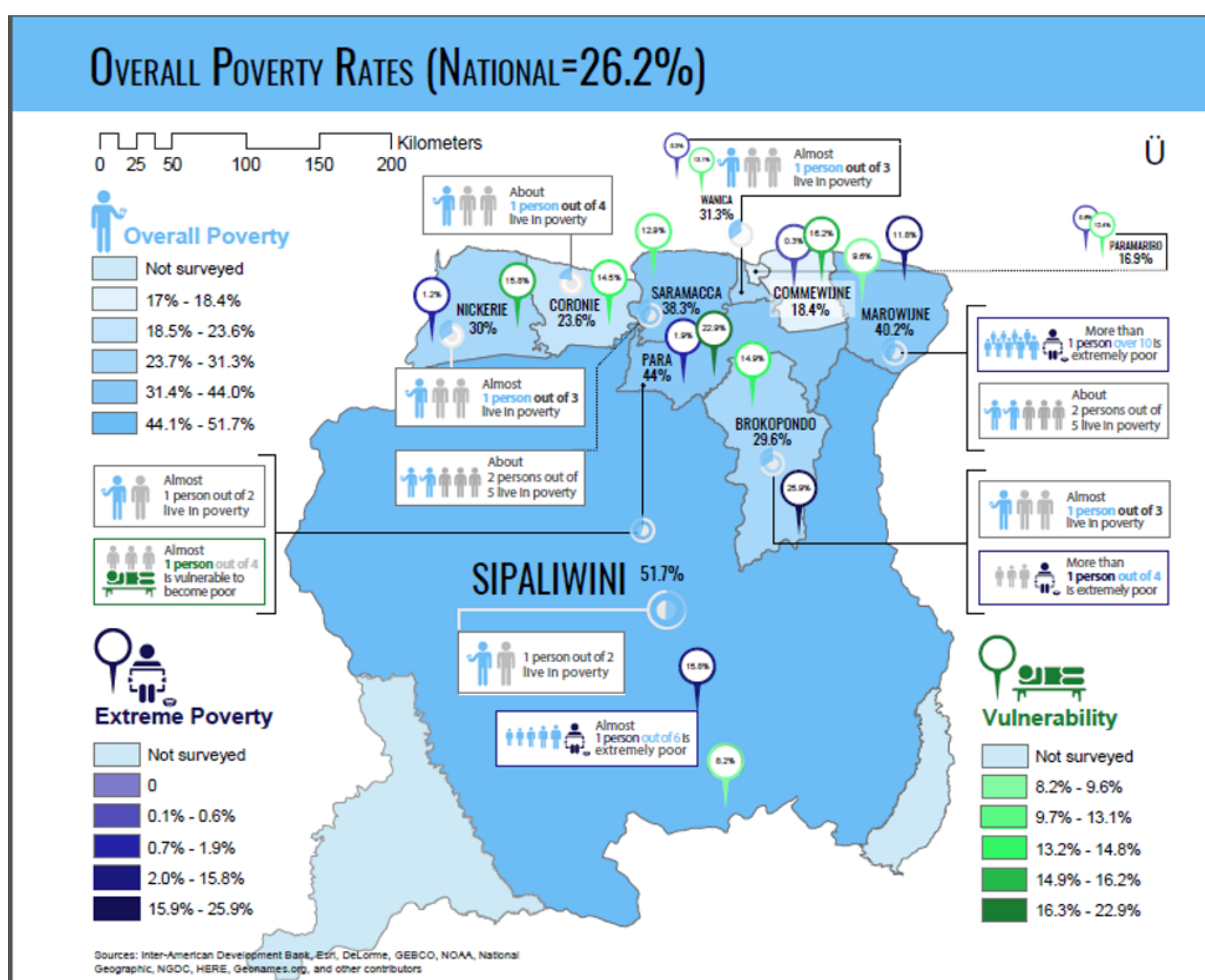


Figure 5: Distribution of poverty rates over the country⁶¹

57 World Bank. 2019.

58 <https://data.worldbank.org/indicator/SL.UEM.TOTL.NE.ZS?locations=SR>

59 Inter-American Development Bank (IDB) with Electricity Company of Suriname, the Central Bank of Suriname, Survey of Living Conditions in 2016/2017.

60 ILO. 2020. Employability of people with disabilities in Suriname - A baseline study by the International Labour Organization and the Ministry of Labour, Suriname International Labour Organization, Office for the Caribbean - Port of Spain.

61 IDB. 2017.

Gender disparities can be observed between the coastal and interior regions. Despite a commitment to gender equality in the National Development Plan (2017-2021), multiple manifestations of gender inequality remain. Suriname ranks 105 of 162 countries in the 2019 UN's Gender Inequality Index (GII) which compares women's and men's outcomes in three dimensions: reproductive health, empowerment, and economic activity. The GII can be interpreted as the loss in human development due to inequality between female and male achievements in the three GII dimensions⁶². Actions are taken by the Government of Suriname to integrate gender into disaster risk reduction, climate resilience and mitigation. Capacity building activities, supported by the United Nations Development Assistance Framework (UNDAF), focusses on strengthening the resilience of women and girls regarding the availability of sexual and reproductive health services during humanitarian crises. Environment and Climate Change is set as a priority area in the Gender Vision and Policy Document 2021-2035. Effective participation of women in this priority area is essential, not only because women are disproportionately affected by the effects of climate change and disasters, but they are also agents of change and play an important role in formulating and implementing policies and action plans, with different coping capacities. The Gender Vision and Policy Document therefore supports the implementation of gender-sensitive climate and disaster risk policies, strategies and plans, aiming to ensure the effective inclusion and participation of women in these processes.

Suriname also has a considerable indigenous population, who are considered vulnerable due to their marginalised nature and underlying socioeconomic attributes such as poverty. The Indigenous and Maroons tribes have lower per capita earnings, and little access to common infrastructure services such as piped water and electricity. An overall low population density, geographically scattered settlements and difficult-to-access interior land causes uneven and service provision in the interior. Other coastal-interior disparities are seen in different average life expectancies (nine years lower in the interior) and average school attainment. A child in the interior generally receives four fewer years of education than a child in the country's capital of Paramaribo⁶³. The COVID-19 pandemic has an enormous impact on communities living in Suriname's hinterland (both Indigenous and Maroon tribes). These groups are mostly concentrated in

the hinterland and have limited access to basic services such as energy, water and sanitation due to the lack of infrastructure. In addition, the education infrastructure is very weak and has difficulty in continuity. The pandemic has drastically increased these vulnerabilities. Challenges exist such as continuity of health services, limited access to health facilities and limited means to transport. Furthermore, risks are increased by illegal entrance of gold miners from neighbouring countries.

The elderly must be included and planning for in national and local risk reduction strategies. Life expectancy in Suriname has shown a steady increase over the years. The elderly are considered the fastest growing group. In 2004, older persons (over 60 years) constituted 8.6% of the total population, and by 2012, this group was to 10.1% of the population. A 2018 report by the Government of Suriname revealed that the majority of elderly persons live independently but financial arrangements were limited. Suriname has a general old age allowance, which starts at 60 years that is based on a non-contributory pension system. This allowance is accessible to all elderly persons regardless of the economic activity. Despite this needed measure, the report revealed some key insights that highlight the need for addressing underlying challenges faced by elderly populations. Violence against the elderly, is an issue that requires attention. The elderly suffer neglect sometimes, living alone and immobile and at risk of lack of proper care and lack of access to good food or safe drinking water.

Health and vulnerability are interconnected. While health and access to healthcare services can be a direct result of other socioeconomic determinants, poor health or lack of access to healthcare services can further increase vulnerability to disasters. For example, a person with cardiovascular disease is more susceptible to heat stress⁶⁴. Public health impacts can be exacerbated by disasters. Suriname has made meaningful strides to transition to a state of universal health. In 2014, the Basic Health Care Insurance Act was established to provide health insurance coverage for the population under 16 and over 60 years old so as to improve access to services across all levels of care. The working population was insured through employers' health insurance programmes. In 2016, due to financial difficulties, the management of this entire public scheme was transferred to the State Health Insurance Foundation (SZF), currently covering around 75% of

62 UN. 2020 Human Development Report

63 IDB. 2015.

64 Cardona et al. 2012. Determinants of risk: exposure and vulnerability. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.

the population⁶⁵. There is a dedicated primary health service both for the interior (Medical Mission) as well as the urban-coastal area (RGD).

2.2.2 Physical Vulnerability

The capital city of Paramaribo and surrounding urban areas contain almost more than 90% of the total population and greatest concentrations of economic activities in the country. Despite the risk associated with climate change, persons continue to concentrate in low-lying areas at the coast. The lack of an urban spatial planning policy has led to the establishment of unplanned and informal urban settlements. Swampland is often utilised for construction⁶⁶ which exacerbates flood risk but further compounds environmental degradation. Planning, development and/or zoning laws are outdated and insufficient. Compounding this, a lack of enforcement has led to unregulated development in many high risk areas, and private individuals tend to occupy these high risk areas.

Uncontrolled migration of population from rural to urban areas results in the drainage infrastructure being under-sized. In combination with a poorly maintained drainage system, frequent flooding occurs in the inner city of Paramaribo affecting assets including buildings and telecommunication infrastructure. Extreme winds and waves can cause flooding of the coastal transportation infrastructure, leading to infrastructure failures and road network disruptions. Furthermore, a lack of building and civil regulations in addition to financial and management constraints has resulted in poor maintenance of the existing canal network (including waste deposition), outlet structures (sluices and pumping stations) and uncontrolled developments in retention areas intended to support drainage⁶⁷. The interior of the country is sparsely populated, predominantly by Indigenous and Maroon communities with lower per capita earnings. They also have little access to common infrastructure services such as piped water and electricity.

Heavy rainfall and pluvial flooding can damage coastal transport infrastructure. Downpours may also result in more rain-related accidents due to road damages, reduced traction and poor visibility, and traffic delays and disruptions. In April 2021, due

to heavy rainfall, the Nickerie riverbank threshold was exceeded, causing a power station to be flooded. As a precautionary measure, the generators were switched off leading to 860 households and businesses being deprived of electricity⁶⁸.

The Government of Suriname recognises that these underlying vulnerabilities must be addressed through integrated development practices and enforcement. The State Decree Planning Enactment from 1973 known as the Planning Act (Planwet), is approved but has not been operationalised⁶⁹. The (Draft) Coastal Protection Act is specifically designed to protect the vulnerable coastal ecosystems, such as the mangrove forests, from anthropogenic pressures such as urban development and climate change. However, the Act must be approved and enforced for the benefits to be achieved. Likewise, the Integrated Coastal Zone Management Plan (2010) requires implementation⁷⁰. The Act on Construction (2002), while regulating construction to enhance safety, quality, sustainability is limited to the city and provide no considerations for disaster risk reduction, creating a major gap within the physical infrastructure framework⁷¹. The recently approved Environment Framework Act (2020) requires operationalisation and enforcement to aid in addressing some of these vulnerabilities. Suriname's rich natural resources presents an opportunity for ecosystem-based adaptation to reduce vulnerability and support resilience. While Suriname has incurred environmental degradation as a result of anthropogenic activities, there are opportunities for transformation during restoration and rehabilitation efforts to drive ecosystem-based adaptation.

68 www.dbsuriname.com

69 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

70 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

71 Ibid.

65 World Health Organization. 2018. Country Cooperation Strategy: Suriname.

66 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

67 Government of Suriname. 2021.

2.3 Exposure

Exposure refers to the “Situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas”⁷². Suriname’s geographies including its physical landscape, climatological features and anthropogenic practices sets the exposure context for the country. The Inform Risk Index produces significant exposure values for floods (10), followed by epidemics (5.2).

Approximately 90% of the population resides in the coastal area⁷³ where most of the country’s economic activities are concentrated and frequently experiences severe weather conditions including high intensity wind (called Sibibusi by locals), storms and heavy rainfall. The capital city of Paramaribo is considered highly vulnerable to floods due to sea level rise and the increasing intensity of precipitation and loss of land due to coastal and riverbank erosion. Approximately 72% of the population live in a 30 kilometre radius around the capital of Paramaribo⁷⁴, rendering these groups exposed to coastal and other hydrometeorological hazards. The interior houses approximately 10% of the population, consisting mostly of the indigenous peoples and maroons, who reside along the rivers⁷⁵. These groups are not only susceptible to flooding, but also service outages and environmental hazards due to deforestation and mining.

Disasters pose a threat to communication assets and functioning. Much of the communication and information infrastructure is located in the low elevation, coastal zone and are vulnerable to flooding from sea-level rise as well as storm surges. Communication networks can suffer physical damage to infrastructure and experience temporary service disruptions. This occurred recently in 2021 where in July, thousands of households in the Brokopondo and Sipaliwini districts were unable to utilise mobile phones and television services from the main telecommunication provider in the country, due to service interruptions. Illegal mining activities caused failure of the site at Brownsberg in district Brokopondo, one of the main telecommunication site for the interior.⁷⁶

The Suriname coastline has a well-developed mangrove forest. However, this no longer is the case for the greater Paramaribo area, where large areas of mangrove forest have been removed for development, increasing risk to coastal erosion and flood risk. The World Bank Flood Risk Assessment (2017) highlighted that the greater Paramaribo area requires an integrated flood risk management strategy, involving a mix of natural, structural and non-structural interventions, combined with significant policy and institutional changes. Overall exposure will be highest in regions where relatively many households are situated, such as the districts Paramaribo and Wanica. Due to their location and insufficient protection against the threatening sea-level rise and storm surges, both the districts Nickerie and Coronie are highly exposed to sea-level rise, saltwater intrusion and salinisation, which particularly affects rice production depending on freshwater⁷⁷.

72 United Nations General Assembly. 2016. Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.

73 Government of Suriname. 2018. Suriname Progress report on the implementation of the Montevideo Consensus 2013-2018

74 Government of Suriname. 2018. Suriname Progress report on the implementation of the Montevideo Consensus 2013-2018

75 Ibid.

76 www.dwtonline.com

77 Government of Suriname. 2021.

3. Governance Framework

3.1 Commitments to International Frameworks

3.1.1 Sustainable Development Goals

In 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development which incorporates the seventeen (17) Sustainable Development Goals (SDGs). The SDGs serve as a call to action for countries to implement strategies to promote peace and prosperity for all persons. The Agenda recognises that poverty eradication must be accomplished through a holistic approach with considerations for health, education, environmental sustainability and climate change.



Figure 9: United Nations Sustainable Development Goals

3.1.2 Sendai Framework for Disaster Risk Reduction

The Sendai Framework for Disaster Risk Reduction 2015–2030, was adopted at the Third United Nations World Conference on Disaster Risk Reduction, held in Japan in 2015. The Framework replaced the previous Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters, and provides countries with concrete actions to reduce disaster risk. It recognises that the state has the primary role to reduce disaster risk but that responsibility must be shared with other stakeholders including local government, the private sector and communities. The Sendai Framework establishes four priority areas for action and seven targets (comprising 38 indicators) through which member countries can measure their progress. Like much of the global community, Suriname has adopted the Sendai Framework.

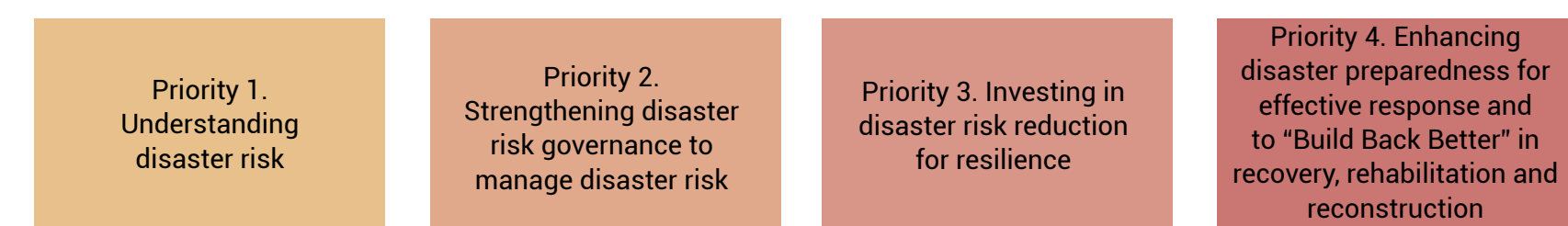


Figure 10: Priority Areas for Action under the Sendai Framework for Disaster Risk Reduction

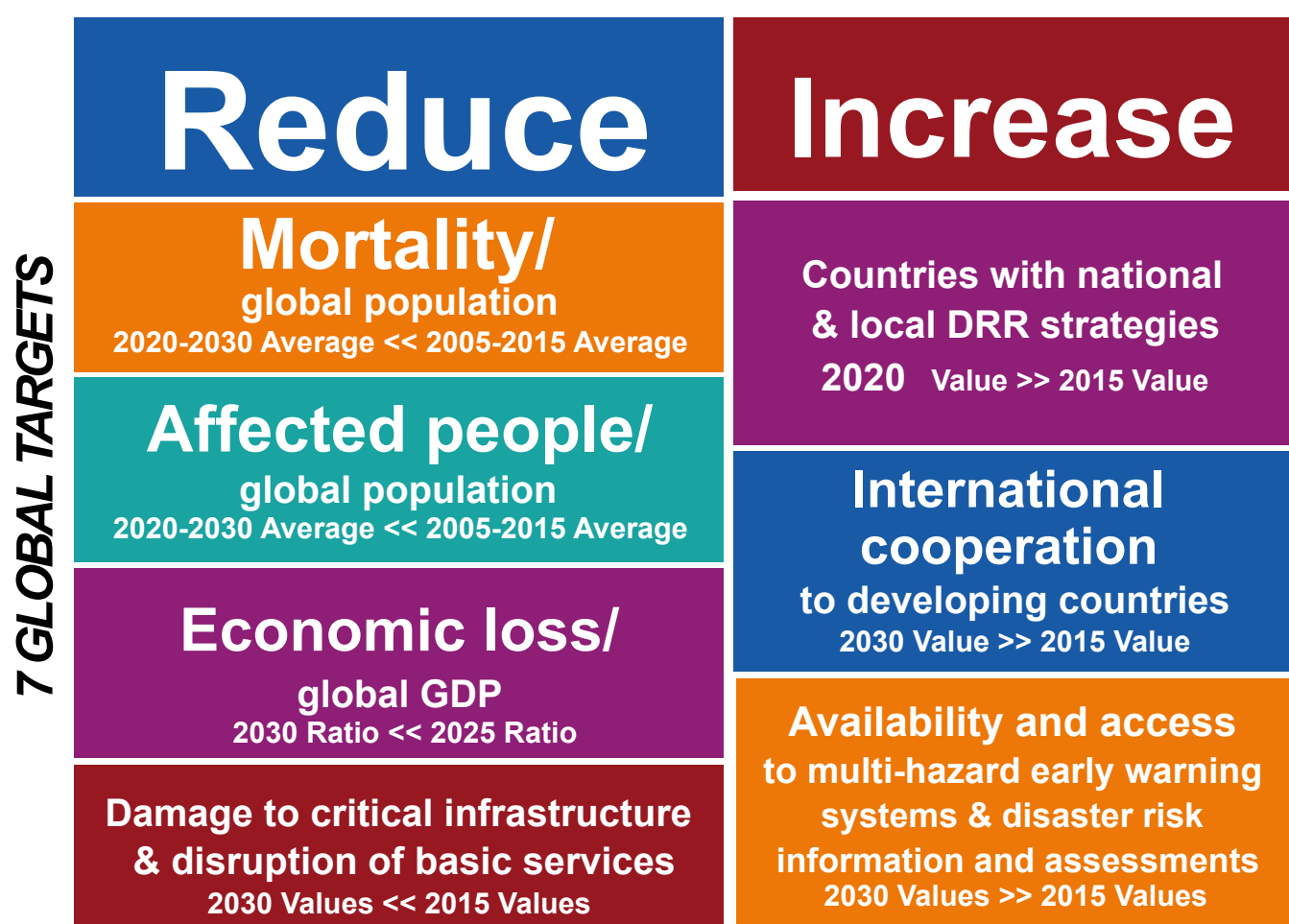


Figure 11: Seven Global Targets under the Sendai Framework for Disaster Risk Reduction

3.1.3 The Paris Agreement on Climate Change

In response to the growing global threat of climate change, the Conference of Parties (COP) 21 in 2015, produced the first legally binding agreement that brings all nations into a common cause to undertake ambitious activities to mitigate against and adapt to climate change. Recognising the impacts anthropogenic activities have on climate change, the Agreement was established to limit global warming to well below 2 degrees Celsius (ideally to 1.5 degrees Celsius), compared to pre-industrial levels. This is imperative for SIDS where climate change impacts are significant. Under the Paris Agreement, countries undertake Nationally Determined Contributions (NDCs), in response to climate change. In January 2020, Suriname produced its Updated Nationally Determined Contribution under the Paris Agreement.

3.1.4 Small Island Developing States Accelerated Modalities of Action (SAMOA) Pathway

The SAMOA Pathway affirms that SIDS are a 'special case' for sustainable development due to their vulnerability to climate change, which should be an urgent global priority. This links to SDG 13, "take urgent action to combat climate change and its impacts," and Target 13.B which refers to promoting

mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalised communities. The Pathway establishes thematic areas to promote sustainable development within SIDS. These include: climate change, inequality, green and ocean based economy, sustainable energy, food security and waste management.

3.2 Regional Frameworks

3.2.1 Comprehensive Disaster Management Strategy and Programming Framework

The Caribbean Disaster Emergency Management Agency (CDEMA) was established in 1991 as CDERA (Caribbean Disaster Emergency Response Agency) with responsibility for coordinating emergency response and relief efforts to Participating States. In 2009, it was renamed to become CDEMA, to acknowledge the comprehensive approach of the Agency as disaster management underwent a paradigm shift from response-centric to comprehensive. As a Participating State, Suriname adopted the Regional Comprehensive Disaster Management Strategy and Results Framework (2014-2024) in 2014, which is aligned to the Sendai Framework for Disaster Risk Reduction.

The Comprehensive Disaster Management (CDM) Strategy 2014 – 2024 produced by CDEMA is the successor to the CDM Strategy 2007-2012. The Strategy is aligned with key international instruments such as the Sendai Framework for Disaster Risk Reduction, the Sustainable Development Goals, and the Paris Agreement on Climate Change and aims to enable safe and resilient CDEMA Participating States through comprehensive disaster management. The Strategy adopts a comprehensive approach, targeting all hazards in all phases of disaster management, across all sectors. The CDM Strategy is established through a wide participatory process that outlines the results framework for Participating States. Climate change, gender, ICT and environmental sustainability underpin all interventions within the strategic areas. The Strategy provides the enabling environment to achieve the desired results in seven areas (Figure 12).



Figure 12: Elements of the Future Desired State for CDEMA Participating States

3.2.2 CDEMA Contingency Plans

CDEMA's Regional Response Mechanism consists of contingency and response guidance tools (plans, protocols, policies, guidelines) which outline immediate and coordinated response mechanisms at the regional level, in response to hazard events affecting Participating States. The Regional Coordination Plan was established to facilitate the mechanism, in support of National Plans. The Regional Coordination Plan necessitates that National Plans include procedures for triggering the regional mechanism and addresses the key emergency response functions. Hazard-specific plans have been developed for: severe tropical weather systems, earthquakes, volcanic eruptions, oil spills, technological and chemical events, pandemic influenza, cholera and most recently COVID-19. CDEMA Coordinating Unit's Contingency Plan establishes the mechanisms for coordinating at the regional level⁷⁸. Under the CDEMA agreement, Suriname is covered by the southern sub-region which is led by Trinidad and Tobago.

3.2.3 Caribbean Resilience Framework

CARICOM member countries adopted the Caribbean Resilience Framework in 2018. Aligned to the CDEMA's Comprehensive Disaster Management Strategy (2014-2024), the framework establishes five pillars of resilience that must be addressed to reduce vulnerability to hazard impacts:

- I. Social Protection for the Marginal and Most Vulnerable
- II. Enhancing Economic Opportunity
- III. Safeguarding Infrastructure
- IV. Environmental Protection
- V. Operational Readiness and Recovery

⁷⁸ CDEMA Country Work Programme for Comprehensive Disaster Management.

3.2.4 Agreement Establishing the Caribbean Public Health Agency

In 2011, Caribbean Community Member States (which includes Suriname), signed the Inter-Governmental Agreement that established the Caribbean Public Health Agency (CARPHA). In so doing, member countries committed to the establishment of a regional, umbrella agency that inter alia, promotes and develops measures for the prevention of disease in the Caribbean and supports the Caribbean Community in preparing for and responding to public health emergencies. Under the agreement, Ministers of Health from all member countries that form the Council, commit to promoting policies and programmes to protect health and prevent disease, including the implementation of improved public health infrastructure.

3.2.5 Antigua and Barbuda Declaration on School Safety

In 2019, Suriname became party to the Antigua and Barbuda Declaration on School Safety- the Caribbean Safe School Initiative (CSSI) which provides a framework to promote school safety in the member countries. The Declaration promotes activities to build resilience within the education sector, disaster risk reduction and resilience education and awareness building. The Declaration establishes key commitments as follows:

- Engaging in the multi-stakeholder "Worldwide Initiative for Safe Schools (WISS)", by supporting the implementation of the Comprehensive Safe School Framework and the Model Safe School Programme in the Caribbean for public and private facilities at all levels;
- Building resilience in the education sector;
- Sourcing financial and other resources from the national, regional, and the international community, from public and private sectors, to aid in strengthening efforts in disaster risk reduction education sector;
- Coordinating with national and regional disaster management bodies to integrate the tenets of comprehensive disaster management into education policies and plans and to ensure alignment with existing national and regional disaster risk reduction and climate change resilience building strategies;

- Strengthening coordination and cooperation mechanisms among stakeholders at the community, national, regional and international levels;
- Fostering greater collaboration among the Ministries of Education in the Caribbean with relevant private sector entities, non-governmental organisations as well as other regional and international entities;
- Defining and implementing a framework to track and measure progress on the implementation of the actions identified in the Road Map on School Safety to be authorised by the Minister of Education.

3.3 National Framework

Suriname has developed and instituted a range of policy instruments that show progress towards systemic planning for disaster risk reduction in support of sustainable development. The following outlines the major national policy instruments, plans and strategies that contribute to the governance framework for disaster risk reduction and climate change adaptation in Suriname.

3.3.1 National Development Plan 2017-2021

Suriname has not formulated a clear, long-term vision on national sustainable development. Instead, five-year development plans are produced, which coincide with the administration period of each new government coming after general elections. As laid down in its Constitution, Suriname's development is guided by five year Development Plans. The current Development Plan, covering the period 2017-2021, structures its development goals along the following four pillars:

- Strengthened development capacity;
- Economic growth and diversification;
- Social progress;
- Utilisation and protection of the environment.

The fourth pillar has one single goal: "Provisions for sea level rise have been made (detailing of the threat and timeline, consensus strategy and long-term investments)", thereby signifying the Government's recognition of climate change risks. The main outcomes under the forth pillar present key opportunities for targeting disaster risk and climate change. These are:

- Challenges as a result of climate change receive the necessary attention and measures are taken to address and to minimise the consequences, if any;
- Threats as a result of human acts or disasters caused by nature are prevented as far as possible (CO₂-emission, Mercury and cyanide pollution, pesticides, herbicides and other agriculture- and stock breeding-related environmental threats) and;
- The economic value of the forest is used in a sustainable manner based on the Environmental Act, the National Environmental Strategy related thereto and the Development Plan 2017-2021, and all in accordance with the national and international obligations of Suriname.

There is a general thrust towards a multi-hazard environment within the Plan. While climate-related risks are well established, the Plan also recognises anthropogenic hazards. The Development Plan makes suggestions on how to minimise possible impacts derived from sea-level rise and other hazards (e.g. hazardous chemicals, waste, radiation, and diseases). Moreover, it adopts the cross-cutting goals of youth empowerment and gender equality, emphasising the need for decentralised action and highlights Suriname's commitment to the SDGs. As the country's development tool, the National Development Plan provides the needed case for directly addressing disaster risk and the underlying social determinants of risk. Overarching these, the Plan commits to the development of a disaster risk reduction strategy for Suriname which shall cover the following key areas:

- Preparation and readiness:
 - o Risk identification (hazardous installations, anticipated recycling natural phenomena, early warning systems).
 - o Anticipation, planning, preparation, and simulation of response.
- National Coordination for Disaster Response:
 - o Formal mandate and structure of information systems and organisational capacity.
 - o Interested parties and networks for disaster response.
- Rehabilitation and Reconstruction "to build back better": developing action programmes based on research and anticipation.
- Networking with the international and regional community for technical assistance and to secure funds for disaster response.

3.3.2 National Climate Change Policy, Strategy and Action Plan, 2014-2021

In 2015, Suriname published its National Climate Change Policy, Strategy and Action Plan (NCCPSAP). The NCCPSAP is consistent with the country's National Development Plan. The NCCPSAP provides a roadmap for climate change management, targeting sectoral activities, capacity building, green technology, financing and monitoring. The NCCPSAP highlights the importance of generating climate data and information, reducing vulnerability, pursuing low-emission development, climate awareness campaigns, access to climate finance, and climate smart development.

3.3.3 Nationally Determined Contributions, 2020

Suriname's Nationally Determined Contributions (NDC) under the Paris Agreement, outlines a cost-effective pathway for the decarbonisation and sustainability of Suriname's economic development. The NDC is fully aligned with national development priorities and contain a comprehensive package of sectoral projects, policies, measures and targets. The NDC includes mitigation actions in four out of six emitting sectors which include: forestry, electricity, agriculture and transport. Together they cover an estimated 70% of the country's emissions. Given Suriname's vulnerability to climate change, adaptation is strongly represented in the NDC. Targets are divided between conditional and unconditional. Suriname is especially vital to the global climate change mitigation effort as its rich forests serve as carbon sinks. The NDC aligns with long-term resilience goals.

3.3.4 National Adaptation Plan, 2019-2029

Suriname's National Adaptation Plan (NAP) was developed with financial and technical support of the Japan-Caribbean Climate Change Partnership (J-CCCP) Project. The NAP seeks to enable Suriname to conduct comprehensive medium and long-term climate adaptation planning and is premised on six main priorities:

- (1) Institutional arrangements, policies and capacities able to lead and coordinate national and sub-national climate change adaptation;

- (2) Data and information collection systems to fully support national and sub-national climate change impacts, vulnerability and adaptation decision-making;
- (3) The integration and institutionalisation of climate adaptation in broader Surinamese economic development policies, plans and programmes;
- (4) National technical capacity that is fully trained and skilled at leading and implementing Suriname's climate adaptation actions;
- (5) Climate change adaptation that respects Surinamese society and culture and reduces gender and social inequities and;
- (6) Identifying and accessing financing and investment especially for innovation driven climate change adaptation technologies.

The priorities as established within the NAP provide many meaningful entry points for the Country Work Programme and coherence among the agendas. The sectors prioritised for immediate term action within the NAP include: Water Resources, Sustainable Forestry, Energy, and Agriculture, Livestock and Fisheries will be addressed in the immediate term. The NAP treats disaster risk reduction as a cross-cutting and integrative sector, involved in varying aspects of adaptation planning. Under the disaster risk reduction cross-cutting sector, ten pivotal outputs are outlined:

- Refinement of disaster risk projections
- Increased disaster monitoring capacity
- Number of data sharing initiatives implemented
- Strengthened disaster risk reduction legislation
- Updated national safety and disaster plans
- Forest Fire Master Plan updated
- Increased disaster risk reduction insurance coverage
- Increased public awareness
- Increased funding for disaster risk reduction programmes
- District level disaster risk reduction plans

3.3.5 National REDD+ Strategy, 2019

Suriname developed its REDD+ Strategy, a five-year plan that aims to reduce greenhouse gas emissions as a result of deforestation and forest degradation, as well as conservation, sustainable management of forests and increasing carbon storage in forests. The Strategy has four strategic lines:

1. Continue being a high-forest/low-deforestation country and receive compensation to invest in economic transition.

This strategic line is about maintaining Suriname's high forest cover, biodiversity and environment. It has two policy lines: Multilateral and bilateral negotiations aiming at receiving financial support for the preservation of Suriname's forest cover and supporting existing, alternative and additional sustainable livelihoods and diversification of the economy.

2. Forest governance

This strategic line addresses the forests' contribution to development by promoting sustainable forest management, e.g. via participatory forest governance structures that involve Indigenous and Tribal Peoples and the private sector.

3. Land use planning

This strategic line targets developing, implementing and maintaining land-use planning, zoning, sustainable practices and tools that result in the optimal use of Suriname's forest and natural resources across sectors (e.g. mining, forestry, infrastructure and agriculture), actors, times and scales, as well as taking into account the development and rights of forest communities

4. Conservation of forests and reforestation as well as research and education support sustainable development

This strategic line seeks to continue and expand conservation and rehabilitation of forest, their biodiversity and ecological functions, while exploring extractive and non-extractive uses that result in community development, well-being and economic diversification.

3.3.6 Environmental Framework Act, 2020

The Environmental Act (2020) makes provisions for the protection and sustainable management of the environment in Suriname. The Act establishes the National Environment Authority and contains provisions regarding Environmental Impact Assessment (EIA) and pollution control, which should counteract the major drivers of Suriname's forest degradation and deforestation.

3.3.7 Agriculture Disaster Risk Management Plan, 2019

The Agriculture Disaster Risk Management Plan governs disaster risk in the agriculture sector and is structured around three major result areas:

- Strengthening of institutional and technical capacities
- Development of a Risk identification and information system, also for early warning.
- Increasing resilience, preparedness and response capacity as well as creating a safety culture for sustainable livelihoods in agriculture

3.4 Institutional Framework

3.4.1 National Context

The Constitution of Suriname does not directly speak of disasters, but it authorises the President to declare a state of emergency to preserve national security in the case of any danger or threat, subject to the assent of the National Assembly. Although the Ministry of Defence is responsible for national policies on disaster management, Suriname lacks a comprehensive strategy for coping with the impacts of disasters whether they are naturally-induced or man-made.

The National Coordination Centre for Disaster Relief (NCCR) is a special division under the Ministry of Defence to safeguard the national safety and security regarding threats of possible disasters. The NCCR is required to develop national policies on disaster management and is the formal focal point to collaborate with all stakeholders such as the district commissioners, police, army, fire department, medical Services, NGOs and other governmental units. In the event of a national disaster, a Crisis Team is formed, comprising Disaster Coordinators from the Ministries of Defence, Ministry of Justice and Police, Ministry of Agriculture, Husbandry and Fisheries and Ministry of Health. The Crisis Team prepares an assessment of the disaster and controls response activities. With the COVID-19 pandemic, a National COVID-19 Outbreak Management Team was established and in June 2020, and a Comprehensive National Preparedness and Response Plan for COVID-19 was created in partnership with the Inter-American Development Bank (IDB) and PAHO.

The NCCR comprises five units that cover the following areas:

- **Logistics:** handles all logistics within the unit such as food and working material.
- **Operations:** implements all plans that are made by the Planning and Research Unit. They also participate in disaster response.
- **Communication:** arranges for all possible

communication al systems for the division.

- **Planning and research:** undertakes research on possible threats of upcoming disasters; they also implement information sessions with vulnerable communities so they can be better prepared to deal with emergencies and disasters before, during and after the disaster occurs.
- **Legal affairs:** this unit coordinates all legal affairs for the division⁷⁹.

The Directorate for the Environment at the Ministry of Spatial Planning and Environment is the focal point for the United Nations Framework Convention on Climate Change (UNFCCC) and therefore plays a key leadership role in the implementation of the NDC and NAP in collaboration with the National Institute for Environment and Development in Suriname (NIMOS). The Directorate is responsible for developing and coordinating the implementation of climate-related policies and plans, monitoring the National Environmental Policy, as well as coordinating the implementation of multilateral environmental agreements. NIMOS' role includes operational decision-making and collaboration with other government ministries in relation to environmental matters, and also acts as the National Environment Authority (NMA). The NMA is an independent administrative body with legal authority and has the task and power to implement all of Suriname's environmental management, policy and strategy rules and the Environmental Framework Act. Moreover, the NMA is the authority to conduct investigations, to prosecute and to bring criminal offenses regarding the environment to justice.

3.4.2 Local Government and Community

Local government structures were established in Suriname in 1989, with the passage of the Act of Regional Institutions which resulted in ten formal districts⁸⁰. At this district level, the District Commissioner has a lead role in the district's disaster management system which forms part of the national mechanism (Figure 13). Each District Commissioner is responsible for the development of a district *Disaster Response Plan*.

⁷⁹ Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

⁸⁰ Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

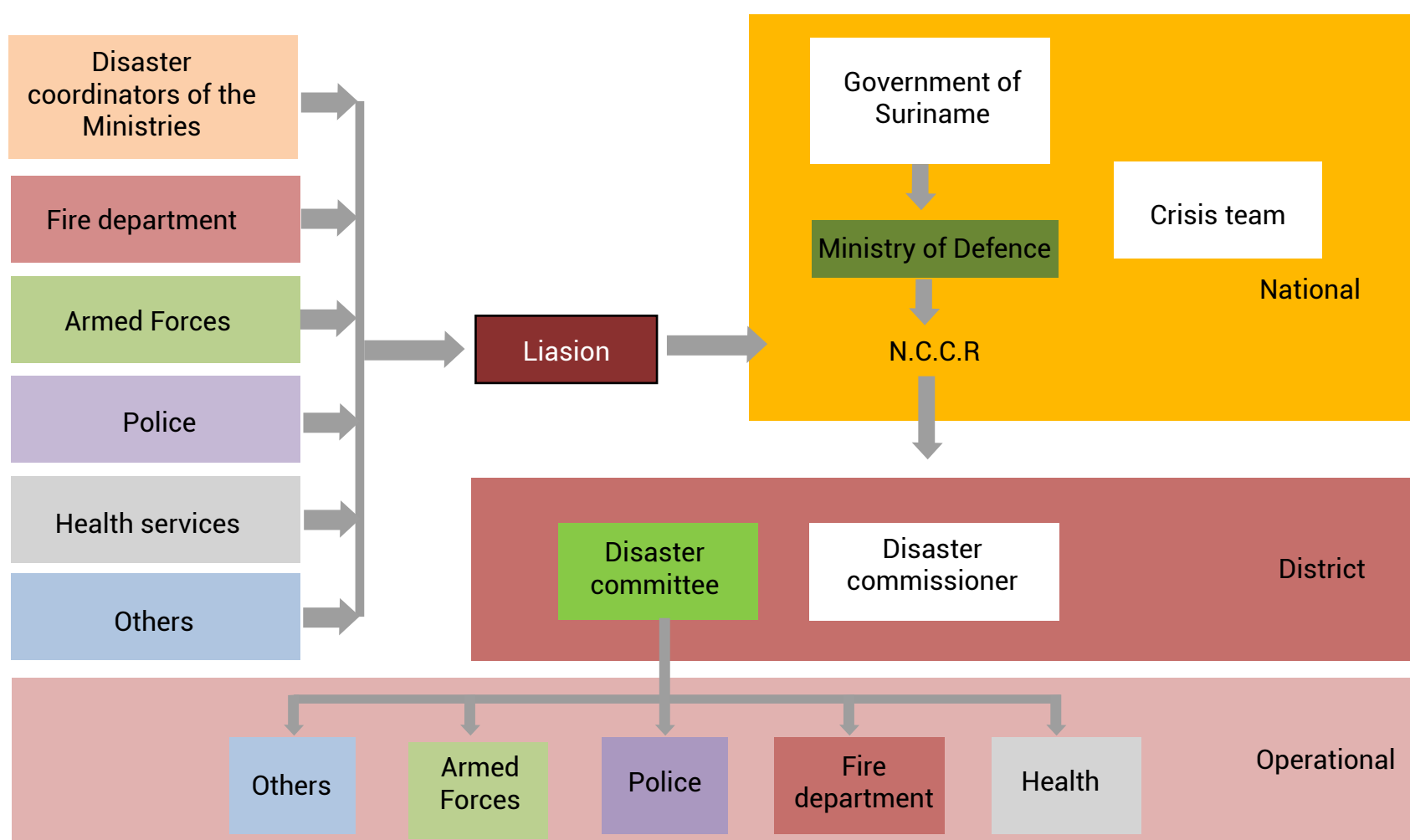


Figure 13: National Disaster Management Structure⁸¹

⁸¹ Source: Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

4. Policy Coherence

Suriname's key policies in support of disaster risk reduction are discussed in Section 3.3. This section summarises the coherence of the main policy instruments for climate change and development with the three governing international frameworks in these areas i.e.: the Sendai Framework for Disaster Risk Reduction, the Paris Agreement and Sustainable Development Goals (SDGs).

4.1 Strategic Coherence

Strategic coherence explores whether disaster risk reduction and climate change adaptation are explicitly addressed jointly or if there is an aim to strengthen the relationship and linkages. The National Development Plan (2017-2021) is the overarching development roadmap and stresses that sustainable development should be incorporated at all levels and in all areas of policy and planning mechanisms and jointly set goals. Environmental well-being and climate action are an integral part within the four pillars of the Plan (Section 3.3.1). Strategic coherence is very evident as disaster risk reduction is explored in chapter "IX.4. Risk of Disasters Caused by Man or Nature", articulating that Suriname will develop a "disaster-risk reduction strategy". A clear link can also be observed with climate change adaptation throughout the whole document. The fourth pillar 'Utilization and Protection of the Environment' gives high priority to environmental well-being and climate actions in particular sea-level rise and its dangers to development, long-term investment and strategies. Moreover, the National Development Plan explicitly establishes its linkage with the SDGs and seeks to fulfil commitments under the Sendai Framework for Disaster Risk Reduction as well as the Paris Agreement, thereby creating strategic coherence.

Suriname's National Adaptation Plan (NAP) is designed as a ten-year framework (2019-2029) aimed at addressing 'impact reduction through adaptation responses and resilience building and integrating strategies across multiple sectors. At the national level, priorities include institutional strengthening, improvement of data and information collection, integration of climate change into economic development, enhancing technical capacity, consideration for gender inequalities in adaptation initiatives, and increasing access to financing and investment. These priorities are reflected as strategic outcomes under the action

plan of the NAP. Strategic coherence is further substantiated as disaster risk reduction is one of the cross-sectoral or integrated sectors that contribute to or impact on the functions of the productive sectors including their climate change adaptation and mitigation activities. The NAP also explicitly seeks to fulfil national commitments under the UNFCCC, the Paris Agreement and the SDGs.

Strategic coherence is also evident within the National Climate Change Policy, Strategy and Action Plan (NCCPSAP 2014-2021) although low. Its two objectives provide a response to climate change along with a commitment towards climate compatible development. The NCCPSAP provides a roadmap from 2014 to 2021, including sectoral approaches towards climate resilience, capacity building, technology transfer and financing opportunities. Disaster Risk Management is one of the sectors within the NCCPSAP and clearly integrated with climate change.

The Nationally Determined Contributions (NDC,2020) mentions that climate-resilience is key to sustainable development, and in particular to achieving the SDGs. The NDC aligns with long-term resiliency goals, included in the new National Adaptation Plan. Delivering on its NDC will help Suriname achieve the SDGs, and achieving the SDGs will facilitate Suriname's efforts to mitigate and adapt to climate change. However, apart from this linkage, strategic coherence is low.

4.2 Conceptual Coherence

Conceptual coherence explores disaster risk reduction, climate change adaptation and sustainable development are linked conceptually, in particular through the concept of risk. Although the National Development Plan does not provide a clear, long-term vision on national sustainable development, its four pillars are aligned with three dimensions of the SDGs; including inclusive economic growth, social inclusion and protection of the environment. The Plan makes suggestions on how to minimise possible impacts derived from sea-level rise, flooding and other hazards in order to ensure sustainability. Resilience, while a recurring theme in the Plan, is not defined but occurs within the context of economic and social resilience. Conceptual coherence can be further strengthened by establishing the synergies and differences among the areas.

The NCCPSAP provides a clear roadmap to achieving adaptation goals in the short to medium-term and makes clear the linkages between the deleterious impacts of climate change and Suriname's risks of disaster. The Disaster Risk Management action plan within the NCCPSAP provides concrete actions the Government intends to embark upon to reduce the country's vulnerability by putting emphasis on research, increasing awareness, strengthening the institutional framework through laws, policy and regulation, integrating climate resilience in DRM infrastructure and operation, and financial measures to increase climate resilience.

Disaster risk reduction is a cross-cutting sector within the NAP, overarching the functioning of the productive sectors and has separate risk and vulnerability profiles. The first goal of the NAP 'Impact reduction through adaptation and resilience building' addresses climate change adaptation and disaster risk reduction, whereas resilience is mentioned in the context of the Hyogo Framework for Action. The role of gender is well articulated in the context of disaster risk reduction within the NAP, recognising the varying vulnerabilities and differing capacities among gender roles. Consequently, conceptual coherence within the NAP is substantial. Suriname's updated NDC strives to achieve a net-zero emissions and climate-resilient future and in the context of the COVID-19 pandemic, it is also a guiding tool for sustainable recovery. The updated NDC is aligned with the main climate policy and planning instruments in the country such as the Policy Development Plan (2017-2021), the National Adaptation Plan, and the National Climate Change Policy, Strategy and Action Plan (2014-2021). Conceptual coherence within the NDC is evident by the underpinning theme of resilience. Despite these national plans and strategies such as the NCCPSAP and the NAP considering disaster risk reduction and climate change adaptation together, the relationship regarding the influence of climate change on disaster risk is vaguely described.

4.3 Institutional Coherence

Institutional coherence analyses whether coordination between disaster risk reduction, climate change adaptation and the SDGs is envisioned, and if and how institutional arrangements support coherence. Institutional coherence is necessary to support the operational aspects of coherence. The institutions for disaster risk reduction and climate change adaptation are separate which presents a challenge to institutional

coherence. Whilst the NCCR is responsible for addressing disaster risk management, the role of developing and coordinating the implementation of climate-related policies and plans in Suriname falls under the Directorate for the Environment at the Ministry of Spatial Planning and Environment. The Directorate's main responsibility is to develop and monitor the National Environmental Policy, as well as to coordinate the implementation of multilateral environmental agreements. This Directorate is the focal point for the United Nations Framework Convention on Climate Change (UNFCCC) and therefore plays a key leadership role in the implementation of the NDC and NAP together with the National Institute for Environment and Development in Suriname (NIMOS). The Ministry of Spatial Planning and Environment also serves as the national designated authority to the Green Climate Fund (GCF) and plays a role in accessing climate finance. NIMOS' role includes operational decision-making and collaboration with other government ministries in relation to environmental matters, and it is in the process of becoming the National Environment Authority⁸². The Ministry of Spatial Planning and Environment together with the NIMOS, are responsible for the implementation of not only the NAP but also the NCCPSAP.

The NCCR is the coordinating Institute for Suriname for the development of the Comprehensive Disaster Management (CDM) mechanism. Although the NCCR has no formal institutional arrangements with the Ministry of Spatial Planning and Environment nor with the NIMOS, partial integration regarding institutional coherence can be observed as the National Development Plan, the NCCPSAP as well as the NDC mention latter agencies as the lead regarding environment/climate change; and in the case of the NAP, the NCCR is mentioned as the lead DRM agency. Despite this, the segregated ownership and absence of a joint mechanism presents challenges to institutional coherence. The National Development Plan is led by Suriname's Planning Bureau, *Stichting Planbureau Suriname*, which falls under the Ministry of the Interior, General Affairs Directorate⁸³.

4.4 Operational Coherence

Operational coherence considers measures, actions and activities which bring together the SDGs, disaster risk reduction and climate change

⁸² Government of the Republic of Suriname. 2019. National REDD+ Strategy of Suriname. Paramaribo, Suriname.

⁸³ <https://www.planningofficesuriname.com/over-ons/>

adaptation, and to which extent planning is considered cross-sectoral. Operational coherence is evident across all the instruments through their multi-stakeholder platforms and multi-sectoral involvement. The limitation to operational coherence is the identification of the wide range of activities that enhance cohesion which are limited to capacity building and Ecosystem-based Adaptation across the policy instruments.

Operational coherence is partially evident in the NCCPSAP as it focuses on the following areas in responding to climate change: data generation, reducing vulnerability in coastal and interior regions, pursuing low-carbon emission, raising awareness, accessing climate financing, and integrating climate compatible development into national development planning and national budgets. The NAP shows operational coherence, focusing on sectoral adaptation action plans provided for twelve areas. The priority sectors identified in the NAP include water resources, sustainable forestry, energy, and agriculture, livestock and fisheries. For the implementation of each priority sector relevant ministries/agencies will be designated as focal points for respective sectoral plans while overall leadership and coordination will be overseen by NIMOS. Adaptation is a strong feature of Suriname's NDC, given its vulnerability.

4.5 Financial Coherence

Financial coherence explores whether and how funding strategies and investments bring together the SDGs, disaster risk reduction and climate change adaptation. Suriname's investment strategy for the Development Plan 2017- 2021 recognises four basic financing sources, which are also the sources that will be targeted for climate change related programming. These are: Surinamese funds including government revenue or savings and private incomes or savings; International Funds including public funds and funds from public multilateral organizations or funds made available by friendly countries and; Foreign Direct Investment or funds from international non-profit organizations.

The NAP builds on the financial strategy of the National Development Plan and proposes to serve the strategic and sectoral objectives by various finance modalities, and by working with the Ministry of Finance to review modalities. The updated NDC presents a portfolio of projects and an estimation of costs related to the implementation of adaptation and mitigation measures. However, it is stated that the

country does not have sufficient internal resources to achieve all goals with financial independence. Support from the international community in areas such as finance, technology transfer, renewable energy, and capacity building is expected. The NCCPSAP links development planning and climate change, promoting alternative financing sources for climate compatible development and the creation of a fiscal environment that attracts relevant investment from overseas and domestically. Furthermore, the NCCPSAP presents a range of sector focused fiscal measures in selected NCCPSAP-planning theme programmes and actions. Apart from funding sources, financial coherence is evident within the NAP by its promotion of risk transfer mechanisms for disaster risk reduction. Despite these starting points, financial coherence can be further strengthened across the policy instruments by providing a mechanism for the cross-mobilisation of funds across the platforms.

4.6 Monitoring, Evaluation and Reporting Coherence

Monitoring, evaluation and reporting coherence looks at how these plans bring together coordination and synergies among the SDGs, disaster risk reduction and climate change adaptation. Monitoring, evaluation and reporting coherence enables accountability, especially in the context of regional and international commitments, and aids in resource maximisation through reduce duplication of activities.

The NAP elaborates a framework for monitoring and evaluation, with key indicators. The monitoring and evaluation framework for the NAP provides an overview of the monitoring mechanism at the strategic and sectoral levels. The sectoral mechanism aims to inform ongoing and future planning and implementation processes in relation to the NAP. On the sectoral level, a monitoring and evaluation plan was drafted specifically for disaster risk reduction. However, monitoring and evaluation coherence is limited as there is no synergy with climate change adaptation and/or SDGs mechanisms. The National Development Plan regards monitoring and evaluation as a coherent system with different project phases: project preparation, formulation and implementation (management). The Plan proposes to set up a national Monitoring and Evaluation Institute which provides a key opportunity for strengthening coherence. The NDC does not elaborate on a national system to track implementation, however, it recognises

reporting commitments under the UNFCCC. The monitoring and evaluation programme proposed in the NCCPSAP is to assess the effectiveness of investment in climate resilience and low carbon emission development programmes and actions, to determine if finances are being spent prudently and to guide future investments. The main drawback to monitoring, evaluation and reporting coherence across the instruments, is their failure to propose the implementation of joint monitoring platforms.

5. Disaster Risk Reduction Interventions and Capacities

As presented in Section 3.1.2, Suriname is a signatory to the Sendai Framework for Disaster Risk Reduction where countries aim to build resilience to disasters in support of sustainable development efforts. The subsequent sections highlight Suriname's capacities and existing gaps as under the Sendai Framework.

5.1 Priority 1 – Understanding Disaster Risk

The Sendai Framework recognises that effective disaster risk reduction must be underpinned by a comprehensive understanding of disaster risk in all its elements. Understanding disaster risk involves a range of actions to promote risk-informed action through data collection and dissemination, knowledge management, education and awareness building. These activities must be conducted at all levels of society involvement to facilitate shared ownership.

Suriname has undertaken a series of progressive measures to reduce disaster risk. With the preparation of the Suriname State of the Environment (SoE) report, the Government of Suriname has taken an important step in understanding future changes in climate and risk in dimensions of vulnerability, impacts, exposure of persons and assets, hazard characteristics and the environment. The SoE report analyses Suriname's historical and future climate scenarios by looking at climate variables such as rainfall, temperature, wind, humidity, and sea-level rise. By establishing different time horizons, the report shows the changes in these variables in time and lists potential impacts and risks to agriculture, infrastructure, energy, water, and forestry⁸⁴, aiding in understanding future disaster risk. Cognisant that scientific-based data is important for evidence-based decision-making, even though collection of climate data is challenging and resource intensive, the Government of Suriname made the decision to consolidate several institutions under a consortium in order to cluster environmental data from the several institutions. This consortium is called the Environmental Information Network of Suriname (in Dutch: SMIN). This provides a significant⁸⁵ opportunity to strengthen data collection and analysis, however, it is unclear whether the network has been operationalised.

A national risk database or consolidated risk information is unavailable. The 2021 Index of Governance and Public Policy (iGOPP) Report in Disaster Risk Management highlighted as a key recommendation, the need for a Disaster Risk Management Information System (DRIMS). In 2017, the NCCR published the Disaster Risk Reduction Country Document for Suriname, 2014, which provides a wealth of information on disaster risk in the country. The General Bureau of Statistics (ABS in Dutch), was established in 1947 and reconstituted in 2002, operating under the authority of the Statistics Act. The ABS's mission is *"To provide the Surinamese and international communities with high-quality statistics enabling users to gain an insight into the demographic, economic and socio-cultural situation and development of Suriname"*⁸⁶, and provides the institutional mechanism for strengthening statistical data collection, especially as they relate to the collection and analysis of data for social vulnerability assessments. Other state entities also support data collection efforts across the sectors, although with their limitations. The Ministry of Agriculture, Livestock and Fisheries is responsible for data collection and research in the field of agriculture and fisheries. The Ministry of Natural Resources is charged with developing and maintaining an inventory of minerals, natural resource water, and other natural resources with the exception of forests⁸⁷, which is managed by the Ministry of Land and Forest Management.

Although there are mechanisms in place to access environmental data, the country is still facing several challenges concerning climate change and disaster statistics and indicators (for example, there is no risk repository). The National Climate Change Policy, Strategy and Action Plan 2014-2021 (NCCPSAP) for Suriname has identified the lack of climate change data as a limitation for effective planning and decision-making. The SoE report relates that not only is there a lack of research, climate experts, research opportunities (e.g. grants, institutions), instruments, collaboration between research institutions, but also research findings are not integrated into decision-making at the political level. The National Development Plan 2017-2021 prioritises the utilisation and protection of the

84 Government of Suriname. 2021. Suriname State of the Environment Report.

85 Government of Suriname. 2020. Suriname National Adaptation Plan 2019-2029.

86 <https://statistics-suriname.org/en/about-us/>

87 <http://naturalresources.gov.sr/over-ministerie-van-natuurlijke-hulpbronnen/>

environment, but more studies and data are needed to support such decision-making along this line. Cognisant of the country's significant indigenous and tribal population, there is a need to ensure traditional knowledge and practices are integrated within plans and policies.

Monitoring of progress made towards the targets under the Sendai Framework is facilitated through the Sendai Framework Monitor (SFM). The challenge however, is that Suriname has made very little progress in reporting targets under the Sendai Framework. To date, Suriname's reports for years past, have not yet started⁸⁸. As such, there is no validated data to determine the extent of the country's progress towards the targets of the Sendai Framework. This makes the case for improved data collection, analysis and dissemination for evidence-based policies and actions, and monitoring of progress towards targets.

The Government of Suriname acknowledges that specific capacities are needed such as generating indicators on each of the critical areas to fight climate change, such as drivers, impacts, vulnerability, mitigation, and adaptation. Furthermore, training on disaster metadata and data collection and modelling are required for various national stakeholders, as capacities in risk modelling and mapping are lacking. The Economic Commission for Latin America and the Caribbean (ECLAC) in collaboration with the General Bureau of Statistics through the "Caribbean relevant climate change and disasters indicators for evidence-based sustainable development policies", are currently undertaking activities to build the capacities of relevant stakeholders in generating climate change and disasters indicators for policy decision-making. The project aims to enhance the capacity of policy makers to use these indicators for more effective climate change and disaster risk reduction actions, thereby contributing to the coherent implementation and monitoring of the SDGs, the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, the SAMOA Pathway and other international agreements⁸⁹.

In the 2021 iGOPP report, Suriname was found to be non-compliant with the indicators of the Risk Identification and knowledge component, signifying a major area for improvement. Risk identification and knowledge activities were hindered due to the lack of a strong legislative and policy environment for disaster risk management activities⁹⁰. The study

also found that natural hazards and disasters were not yet a part of the country's culture, evident by risk perception challenges and a general lack of awareness. Key recommendations of the report aligning with Priority 1 of the Sendai Framework include:

- Raising awareness on disaster risk management with a focus on the social construction of risk at all levels
- Integrating disaster risk management and climate change content into the educational curriculum at the primary and/or secondary levels.
- Designing and implementing a Disaster Risk Management Information System (DRIMS), including a database on disasters effects⁹¹.

5.2 Priority 2 – Strengthening Disaster Risk Governance to Manage Disaster Risk

The Sendai Framework acknowledges that while disaster risk reduction requires shared ownership, it must be supported by a robust governance framework that supports mainstreaming. Priority 2 of the Sendai Framework explores efforts in the mainstreaming environment, disaster risk reduction strategies, incentives for disaster risk reduction, coordinating mechanisms, and the supporting institutional and legislative environments for disaster risk management.

Suriname is committed to a range of international and regional instruments (Sections 3.1 and 3.2 respectively) that signify Government's commitment to addressing disaster risk reduction and climate change for resilience and sustainable development. The country has committed to climate compatible development with both climate mitigation as well as adaptation as priorities. Given the low contribution to greenhouse gas emissions and high vulnerability to climate change, the Government of Suriname has consistently addressed climate change adaptation and associated risk in its policies and plans. Adaptation priorities are integrated in national policies, plans and strategies such as Suriname's 2017-2021 National Development Plan, the National Adaptation Plan (NAP), the Nationally Determined Contribution 2020 (NDC) and the Second National Communication to the UNFCCC. All four

88 <https://sendaimonitor.undrr.org/>

89 www.cepal.org

90 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname.

ECLAC.

91 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

instruments recognise the significance of climate change risks for Suriname in major sectors such as water, infrastructure, land use planning, forestry and agriculture. Although this demonstrates a commitment to building climate resilience, disaster risk reduction is weakly established particularly in the National Development Plan, the NDC and the Second National Communication. The NAP on the other hand, includes disaster risk reduction as a cross cutting sector.

A new Ministry of Spatial Planning and Environment was established in 2020 consisting of a Directorate of Environment and a Directorate of Spatial Planning. Together with the National Institute for Environment and Development (NIMOS) they act as the National Environment Authority (NMA in Dutch). The Directorate for Environment, together with NIMOS, are responsible for developing and coordinating the implementation of climate-related policies and plans such as the NAP, the NCCPSAP and the NDC, and is also the focal point to the UNFCCC. A Climate Change Steering Committee was re-established in 2020 which demonstrates national commitment to climate change action. Despite this, Suriname lacks a policy on spatial planning, therefore the Directorate of Spatial Planning has recently installed a working group 'Preparation of Spatial Planning Act' with the task to draw up a Spatial Planning Memorandum and to create a vision on spatial planning.

The concept of disaster risk reduction is brought under the NCCR which resides under the Ministry of Defence. The NCCR was established as a response and relief mechanism, prompted by the 2006 floods⁹². The NCCR has a national coordinating role to manage disasters but the main drawback is the absence of specific legislation that defines the institutional structure and functions of the NCCR⁹³. A National Emergency Plan was developed in interdepartmental commissions. This plan includes activities not only for emergency entities, but also for governmental institutions. However, there is no legal instrument to support the Plan.

The NCCR works with selected Ministries who have a designated Disaster Coordinator: these are the Ministry of Defense, the Ministry of Justice and Police, The Ministry of Agriculture, Husbandry & Fishery, and the Ministry of Health. The District Commissioners have a specific mandate as first responders to coordinate responses on disaster on district level supported by district level organisations according to the emergency management system.

Based on this bottom up approach for disaster management, each district is divided into ressorts and is tasked with formulating an annual development plan that, to an extent, informs the district disaster plan. If an event exceeds the capacity of local first responder agencies, the response will then be escalated to the National Coordination Centre for Disaster Relief. It must be noted that the traditional authorities of Indigenous and Tribal Peoples are increasingly being recognised at the national level, but the responsibility for disaster response in these communities ultimately lies with the Village Council, Ressort Council and/or District Administration⁹⁴.

Disaster-specific legislation and policy are absent from the national framework. While disaster risk management legislation has been drafted, it has not been approved or operationalised⁹⁵. The Constitution of Suriname has no specific provisions for disasters, but it authorises the President to declare the state of emergency to maintain external and domestic security in case of danger or threat in any part of Suriname, subject to previous consent of the National Assembly (Article. 102 Paragraph 3)⁹⁶. Required legislation is not in place leading to ineffective coordination through national and local platforms. Thus, the NCCR does not have a statutory basis. Moreover, an overall National Disaster Risk Management Policy have not been implemented.

The landscape for disaster risk reduction and climate change is fragmented. Disaster risk reduction and climate change are guided by different agreements and managed by different actors (Section 5). Another challenge to the governance framework, is the inadequate sectoral mainstreaming. While sectoral mainstreaming has been occurring in small ways, the absence of a mechanism to legislate disaster risk management into sectoral legislation, strategies, plan and programmes contributes to the weak governance framework⁹⁷. Table 3 highlights some of the national policies and plans that support sectoral mainstreaming.

92 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

93 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

94 Weekes C. and Bello O. D. 2019. Mainstreaming disaster risk management strategies in development instruments (II): Policy briefs for Barbados, Guyana, Saint Lucia, Suriname, and Trinidad and Tobago", Studies and Perspectives Series—ECLAC Subregional Headquarters for the Caribbean, No. 75 (LC/TS.2019/7; LC/CAR/TS.2018/3) ECLAC.

95 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

96 Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

97 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

Sector	Instrument	Description
Planning and Development	The (Draft) Coastal Protection Act Construction Act, 2002	Aims to protect coastal ecosystems. Regulates construction to enhance safety, quality, sustainability of buildings.
Environment	Environmental Framework Act, 2020	Provides a mechanism for the protection and sustainable management of the environment in Suriname and the implementation and carrying into effect of obligations deriving from the membership of Suriname to international agreements.
Water	Integrated Water Resource Management Action Plan	Provides a framework for manage water resources in the face of climate change and disaster risk.
Health	National Health Sector Plan, 2011-2018	Emphasises the importance of health promotion and disease prevention by proposing actions to scale up and improve the delivery of essential public health operations and services as well as to strengthen public health organisation in Suriname.
Energy	National Oil Spill Contingency Plan, 2018	Provides a framework for response to oil spills in support of impact minimisation.
Mining	Artisanal and Small Scale Gold Mining National Action Plan, 2018	Aims to reduce, and where feasible, eliminate mercury use in artisanal and small-scale gold mining.
Agriculture	Agriculture Disaster Risk Management Plan, 2019	Recognises the vulnerability of the agriculture sector and aims to reduce disaster risk through: <ul style="list-style-type: none"> • Strengthening institutional and technical capacities • Development of a risk identification and information system, also for early warning. • Increasing resilience, preparedness and response capacity as well as creating a safety culture for sustainable livelihoods in agriculture.

Table 3: Summary of policies and plans within the national framework contributing to disaster risk reduction mainstreaming

Shortcomings in the legislative and policy environment for disaster risk reduction, have translated into operational and institutional challenges⁹⁸. The 2021 iGOPP report presents a range of recommendations to strengthen the governance framework for disaster risk management:

- Reviewing, revising and enacting the Draft Disaster Risk Management law
- Reviewing the National Environmental Act concept to integrate disaster risk analyses.
- Establishing civil society participation mechanisms in disaster risk management.
- Establishing normative and institutional frameworks based on disaster risk and climate change analyses to provide guidance and technical assistance at territorial and sectorial levels.
- Elaborating regulations establishing an inter-institutional organisation at the national level for emergency and disaster preparedness and responses, which summarise and expand the current NCCR's roles and functions.
- Mainstreaming the disaster risk management law through sectorial, territorial, climate change and public services regulations.
- Promoting in the new disaster risk management regulation that the Districts and Ressorts, Sectors/Ministries and public utility companies have the explicit responsibility for integrating disaster risk reduction roles and responsibilities⁹⁹.

A disaster risk reduction strategy is a significant component of the governance framework for disaster risk reduction. This risk report can aid the development and revisions of the Country Work Programme. It is therefore crucial that the findings of this study are reviewed and recommendations considered for the development and implementation of the national disaster risk reduction strategy.

5.3 Priority 3 – Investing in Disaster Risk Reduction for Resilience

Investing in disaster risk reduction involves the allocation of resources in support of the disaster risk reduction agenda. Investing in disaster risk includes risk transfer mechanisms, critical infrastructure risk prevention and reduction; land-use mainstreaming; strengthening building codes; health systems resilience; social protection mechanisms for vulnerable groups; and integrating disaster

risk reduction into environmental management practices.

The Second National Communication (2016) highlights that Suriname's vulnerability to present and future climatic conditions and to the impacts of sea level rise is high. Among the projected effects of climate change are a one-metre rise in sea level and increases in temperature and precipitation. This is expected to lead to inundation of highly populated sections of the coastal zone including Wanica and Paramaribo, land loss and an increase in environmental hazards related to ecosystem destruction and coastal erosion. Coastal and inland flood events are also likely to occur more frequently, with new areas at risk. Thus without risk reduction that incorporates climate change adaptation, disaster risk in Suriname is likely to increase to levels that threaten the physical viability of the coastal zone and the economic viability of the country. The floods in 2006 and 2008 led to severe damages in almost all main sectors, such as infrastructure, agriculture and health leading to a decline in the GDP. In response to these threats and acknowledging the importance of the agriculture sector, the Ministry of Agriculture, Livestock and Fisheries launched its first Agriculture Disaster Risk Management Plan (ADRM) in 2019. With this plan the Government of Suriname focusses on increasing resilience, preparedness and response capacity and developing a risk identification and information system, including strengthening institutional and technical capacities. The Suriname Health Sector Plan 2011-2018, recognises the importance of hazard planning and mitigation. The Ministry of Health has installed a Health Disaster Commission which is charged with preparing the Ministry for potential health disasters and is chaired by a National Health Disaster Coordinator.

Other initiatives from the Government of Suriname has led to the construction of coastal defense structures in some places as an adaptation measure against the effects of climate change¹⁰⁰. In 2017, a new sea dike was constructed in Coronie to protect agricultural land and properties southwards. The implementation of the Saramacca Canal System Rehabilitation Project, a World Bank-funded flood risk management project amounting to USD 35 million, will benefit more than 350,000 people living in vulnerable settlements in the Greater Paramaribo area. The investment will improve drainage infrastructure and strengthen the Saramacca Canal system, to reduce flood risks; optimize the overall maintenance of the canal and navigation; reduce the inundation time for property and businesses; develop a flood forecasting service; and implement

⁹⁸ Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

⁹⁹ Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

¹⁰⁰ ICZM. 2015.

an emergency response in the event of a disaster¹⁰¹. This World Bank project also complements existing efforts from other partners to strengthen disaster risk management in the country¹⁰².

Investing in disaster risk reduction also involves investing in land-use and development mainstreaming. In 2019, approximately 75 homes were affected by heavy winds in combination with heavy rainfall and the financial damages¹⁰³. To cope with this and other associated hazards, the Government of Suriname updated its Building Code including improvement in construction regulations. While meaningful, the building code is pending finalisation and approval. Another existing challenge to development mainstreaming is that regulations on development planning and land use do not make provisions for the zoning of areas at risk¹⁰⁴. Additionally, risk assessments are not integrated into development initiatives and there are no incentives for risk mitigation activities if undertaken.

Structural approaches to financial protection and governance for risk management are lacking. Development funds and disaster-specific funds are absent¹⁰⁵. There is no national budget allocation for assistance in emergencies at the district level. The District Commissioner is responsible for the management of the District Fund with which public services are funded, however, the mechanisms for local revenue generation and financial management are under-developed. Other funds exist in the country but they do not directly address investment in risk reduction or disaster management, and are used for humanitarian activities. Despite these challenges, there is evidence to support investment in social protection measures that aid in addressing the underlying drivers of vulnerability. The Government of Suriname supports vulnerable groups through a cash transfer programme for poor households, child allowances, disability grants, school supply grants, and health care services to the poor¹⁰⁶.

There is a need for strengthening risk transfer mechanisms. Unlike many of its Caribbean counterparts, Suriname has not purchased a policy

from the Caribbean Catastrophe Risk Insurance Facility. Moreover, insurance of public assets is not mandated through law. The 2021 iGOPP report also highlighted the absence of a financial protection structure for the capital city of Paramaribo in the event of a disaster, or a disaster risk transfer instrument for a portfolio of assets for which it is fiscally responsible¹⁰⁷. Limited coverage is available for disasters related to climate change. Most companies offer policies for home and corporate building insurance, fire, and burglary; only two companies presently offer coverage against severe winds and rain, and none offer flooding. The iGOPP report further revealed that there were no approved ex ante financial mechanisms to promote economic recovery post-disaster and no established protection structure for the agriculture sector. The report presented a range of recommendations for strengthening investment in disaster risk reduction:

- Developing a financial strategy to guide the management of disaster risk in the country
- Designing and implementing a budgetary instrument to identify the budget allocations related to ex ante disaster risk management programmes and climate change adaptation activities.
- Complementing Suriname's Building Codes with regulations to apply disaster risk reduction measures in public and private infrastructures.
- Assigning responsibilities to the Ministry of Finance for developing risk retention and risk transfer strategies
- Considering the creation of a national disaster risk management fund that finances both emergency response and risk reduction activities
- Evaluating the feasibility to contract contingent credit lines
- Promoting the identification of risk areas in development planning and land use regulations
- Include disaster risk and climate change analyses in all phases of the public pre-investment process
- Evaluating establishing mandatory insurance for critical public infrastructure
- Developing an ex ante financial protection mechanism to support the economic reactivation of the agricultural sector after post-disaster

¹⁰¹ Worldbank. 2019. Project Appraisal Document for the Saramacca Canal System Rehabilitation Project.

¹⁰² Ibid.

¹⁰³ Algemeen Bureau voor de Statistiek (ABS). 2020. 9th Environmental Statistics Publication. Paramaribo, Suriname.

¹⁰⁴ Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

¹⁰⁵ Ibid.

¹⁰⁶ IDB. 2011. Suriname will improve social protection system with IDB support.

¹⁰⁷ Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

Recommendations for risk transfer mechanisms are further substantiated by the National Adaptation Plan (2019-2029) which advocates for:

- Increased access to risk insurance for the Agriculture, Livestock and Fisheries sector
- Increased disaster risk reduction insurance
- Considerations for insurance in district adaptation planning
- Specialised insurance coverage schemes for health, housing and infrastructure and other areas vulnerable to the impacts of extreme weather conditions

5.4 Priority 4 – Enhancing Disaster Preparedness for Effective Response To “Build Back Better” in Recovery, Rehabilitation and Reconstruction

Recovery and rehabilitation must aim not to simply restore to the pre-disaster circumstances but to “build back better” so as to eliminate or minimise previous vulnerabilities. Enhancing preparedness for effective response to “build back better” involves preparedness plans, business continuity planning, strengthening early warning systems, critical infrastructure resilience, training and exercising, community planning, and recovery and reconstruction policies.

Importance is given to building resilience at the national and district level via training programmes. Multiple training workshops with CDEMA and the IFRC have sought “to strengthen and sustain national resilience through prioritised targeting of the most vulnerable communities” in Suriname¹⁰⁸. The Suriname Red Cross Society, a main partner of the NCCR, has conducted several community awareness and capacity building training sessions under the, as well training and education in risk management¹⁰⁹. With funding from the UNDP GCCA+ project, the Suriname Red Cross conducted a project focused on disaster risk reduction and climate change adaptation in vulnerable communities and schools in districts Paramaribo, Para, Commewijne

and Wageningen. This project was co-financed by UNICEF. Awareness sessions were organised in seven school communities, reaching over 1700 primary school children, ages 6 to 12 years¹¹⁰. Furthermore, community training activities are regularly programmed and implemented in collaboration with other NGOs as well as under UN-finances programmes such as the GCCA+ project and JCCCP project. After the flooding of 2006, some organisations such as the Fire Department, the Red Cross, and others have done community programmes, but this is not an integrated exercise¹¹¹. There is therefore a need for a formalised training strategy.

A national emergency operations centre has been designated and is located within the country’s capital. The Suriname National Emergency Plan includes activities not only for emergency entities, but also for governmental institutions. However, there is no legislative instrument supporting the plan. At the local level, disaster plans exist for the districts. The support and funding from the UNDP-GCCA+ project¹¹² made it possible to develop district plans and train all District Commissioner’s Offices. The challenge with disaster plans and activities in Suriname however, is that they remain reactive, lacking the needed focus on risk reduction elements¹¹³.

There are currently no specific legislations or policies to manage the recovery process. Recovery plans are developed only when a disaster happens. Whenever a disaster occurs, the Government of Suriname through the NCCR, provides relief goods to the victims, but long term recovery planning is limited and there are no documented systems for “building back better” post-disaster. The Policy Development Plan 2017-2021 briefly mentions reconstruction and recovery, but the section is rudimentary and does not establish any recommendations for a resilient retrieval outside of the “building back better” theme¹¹⁴. Contingency,

108 Weekes C. and Bello O. D. 2019. Mainstreaming disaster risk management strategies in development instruments (II): Policy briefs for Barbados, Guyana, Saint Lucia, Suriname, and Trinidad and Tobago”, Studies and Perspectives Series–ECLAC Subregional Headquarters for the Caribbean, No. 75 (LC/TS.2019/7; LC/CAR/TS.2018/3) ECLAC.

109 IDB. 2018. Indicators for Disaster Risk and Risk Management Program for Latin America and the Caribbean – Suriname. Technical Note; 1454.

110 UNDP. 2019. Global Climate Change Alliance (GCCA+) SURINAME ADAPTATION PROJECT Increasing Suriname’s resilience against the negative impacts of Climate change.

111 IDB. 2018. Indicators for Disaster Risk and Risk Management Program for Latin America and the Caribbean – Suriname. Technical Note; 1454.

112 UNDP. 2019. Global Climate Change Alliance (GCCA+) SURINAME ADAPTATION PROJECT Increasing Suriname’s resilience against the negative impacts of Climate change.

113 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

114 Weekes C. and Bello O. D. 2019. Mainstreaming disaster risk management strategies in development instruments (II): Policy briefs for Barbados, Guyana, Saint Lucia, Suriname, and Trinidad and Tobago”, Studies and Perspectives Series–ECLAC Subregional Headquarters for the Caribbean, No. 75 (LC/TS.2019/7; LC/CAR/

emergency and business continuity planning at the national and sectoral level requires urgent attention. In the key sectors assessed by the iGOPP report, no continuity or emergency plans were revealed¹¹⁵. Likewise, a critical infrastructure registry does not exist. A similar policy or protection strategy for the protection of these infrastructures, is also absent. This is especially crucial as much of the country's assets are located in its very vulnerable coastal area. The 2021 iGOPP report highlighted this shortfall among others in enhancing disaster preparedness and “building back better” post-disaster. Its recommendations included:

- Defining the essential buildings and critical infrastructure
- Promoting regulations that mandate public entities to reduce the vulnerability of essential buildings and critical infrastructure
- Evaluating the establishment of mandatory insurance for critical public infrastructure
- Providing official mechanisms for crisis management at the highest national political level
- Developing tools and mechanisms to undertake damage assessments and analyses to guide emergency responses and humanitarian assistance
- Designing and implementing a community-centered Early Warning System for climate, meteorological hazards and/or wildfires

After disastrous flooding in 2006 and 2008, an early warning system was developed in 2009 by the Anton de Kom University of Suriname (ADEKUS) in cooperation with the NCCR to estimate the occurrence of flooding of the Upper-Suriname River and the Tapanahony river. Since 2010, the network expanded with water-level measuring stations in Pikin Rio and the Gran Rio, the Coronie swamp, and the Nani swamp. Staff from NCCR, ADEKUS and other institutions are trained in the use of this system and interpretation of the data¹¹⁶. Due to unclear roles and responsibilities (e.g. in data gathering/analysis, management and operational cost), the hydrometeorological early warning systems are currently working inefficiently¹¹⁷. The 2017 Disaster Risk Reduction Country Document presented an opportunity for strengthening risk communication efforts through the One -Stop Service Counters which could be used for the reporting of incidents

and disasters. The report also highlighted the Bevolkings Info Centers (BIC's) located at all districts which provide an effective mechanism for sharing information between district administrations and citizens.

5.4.1 A Further Look Into Multi-Hazard Early Warning Systems

Effective early warning systems can reduce loss and impacts incurred from hazard occurrences. An early warning system as defined by the UNDRR is “An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.”¹¹⁸ Within this context, four interrelated components underpin early warning systems if they are to be effective:

- Disaster risk knowledge;
- Hazard detection, monitoring and forecasting;
- Warning dissemination and communication and;
- Preparedness and response capabilities¹¹⁹.

Target G of the Sendai Framework for Disaster Risk Reduction calls for a substantial increase in the availability of and access to multi-hazard early warning systems (MHEWS) and disaster risk information and assessments to people by 2030. MHEWS encompass “several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, cascading or cumulatively over time, and taking into account the potential interrelated effects.”¹²⁰ Cognisant of the multi-hazard context of Suriname, Figure 14 maps the status of MHEWS under the four components of early warning systems, utilising the UNDRR's Hazard Taxonomy groupings¹²¹. It is evident that overall MHEWS capacity requires strengthening.

TS.2018/3) ECLAC.

115 Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

116 Government of Suriname. 2021.

117 Prof. Naipal. July, 2021.

118 [https://www.undrr.org/terminology/early-warning-system#:~:text=Annotations%3A%20Effective%20%E2%80%9Cend%2Dto,the%20hazards%20and%20possible%20consequences%3B%20\(](https://www.undrr.org/terminology/early-warning-system#:~:text=Annotations%3A%20Effective%20%E2%80%9Cend%2Dto,the%20hazards%20and%20possible%20consequences%3B%20()

119 [https://www.undrr.org/terminology/early-warning-system#:~:text=Annotations%3A%20Effective%20%E2%80%9Cend%2Dto,the%20hazards%20and%20possible%20consequences%3B%20\(](https://www.undrr.org/terminology/early-warning-system#:~:text=Annotations%3A%20Effective%20%E2%80%9Cend%2Dto,the%20hazards%20and%20possible%20consequences%3B%20()

120 [https://www.undrr.org/terminology/early-warning-system#:~:text=Annotations%3A%20Effective%20%E2%80%9Cend%2Dto,the%20hazards%20and%20possible%20consequences%3B%20\(](https://www.undrr.org/terminology/early-warning-system#:~:text=Annotations%3A%20Effective%20%E2%80%9Cend%2Dto,the%20hazards%20and%20possible%20consequences%3B%20()

121 United Nations Office for Disaster Risk Reduction. 2020. Hazard Definition & Classification Review Technical Report.

GEOLOGICAL HAZARDS	HYDRO METEOROLOGICAL HAZARDS	ENVIRONMENTAL HAZARDS	BIOLOGICAL HAZARDS	CHEMICAL HAZARDS	TECHNOLOGICAL HAZARDS
1. Earthquake	1. Tropical Cyclone/ Tornado	1. Deforestation	1. Human Epidemics & Pandemics	1. Oil Pollution	1. Boat/Road / Air crash / Accidents
2. Tsunami	2. Flood	2. Land & Soil Degradation	2. Animal Epidemics & Pandemics	2. Persistent Organic Pollutants	2. Infrastructural Failures
3. Volcanic Eruption	3. Storm Surge	3. Biodiversity	3. Pest Infestation		3. Fires
4. Landslide	4. Drought	4. Environmental Pollution	4. Invasive Species		4. Explosions
	5. Cloudburst	5. Wildfires			5. Spills & Leaks
	6. Landslide				
	7. Heat & Cold Wave				

Colour	EWS Components Represented	Colour	EWS Components Represented
	• C1- Disaster Risk Knowledge		• C3- Warning Dissemination and Communication
	• C2-Hazard Detection, Monitoring and Forecasting		• C2-Hazard Detection, Monitoring and Forecasting • C3- Warning Dissemination and Communication

Figure 14: Status of MHEWS for Suriname

6. Stakeholder Analysis

Partnerships are imperative to disaster risk reduction, climate change efforts and achievement of the SDGs. Partnerships are especially important to SIDS that are disproportionately affected by climate change, with limited resource capacities for mitigation and adaptation. Suriname has benefitted from partnerships at varying levels, including the community, private sector, regional bodies and international agencies.

Despite the absence of legislation that defines the institutional structure for disaster management, the NCCR works in close collaboration with the District Commissioners at the local level, Disaster Coordinators of the ministries, fire department, health services and other partners. Meetings are held periodically and hands-on support is received from representatives from various ministries, the NGO Interior Network (NGOs working in the Interior), the Suriname Red Cross, PAHO, and the Medical Mission. During emergency response, these stakeholders form the core institutional framework for management and recovery operations. The NCCR has also integrated the private sector into the national platform¹²².

Suriname's national stakeholder base is representative of partnership and shared ownership. The Meteorological Service together with the University of Suriname provides data to the NCCR regarding (extreme) hazardous events and develops hazards maps. The National Institute for Environment and Development in Suriname (NIMOS), is the organisation engaged in giving advice on permit applications, handling environmental complaints, and monitoring mining activities. The Ministry of Regional Development oversees regional governance and the development of the interior. In particular, it handles the improvement of water management systems in agricultural areas through a targeted water board policy and is responsible for secondary and tertiary drainage systems throughout Suriname, with the exception of the areas covered by the Ministry of Public Works. The Ministry of Public Works is the main institution with a mandate to play a role in reducing flood risk. It has the responsibility for the operation and maintenance of the drainage system, the hydrological service, and the meteorological service. This Ministry is also the authority that provides building permits in Suriname.

The challenge to the national framework however, is that all partner organisations of the NCCR have their own protocols, and inter-institutional protocols have not been formally established. The draft emergency and contingency plans from the Red Cross of Suriname and draft emergency plan from the agriculture sector, have not been formally approved due to the absence of legislation about the obligatory nature of emergency plans¹²³.

At the regional and international levels, Suriname has a vast network of partners that support its disaster risk reduction efforts. As a CDEMA Participating State, Suriname has benefitted from technical support through trainings over the years. This support has also been extended to the community level where CDEMA facilitates training in community resilience through the CERT training¹²⁴. In 2020, via a partnership with the Caribbean Development Bank and the Government of Canada, the Canada-CARICOM Climate Adaptation Fund was established to support select countries, including Suriname, in maintaining its disaster risk reduction efforts amidst the pandemic¹²⁵. Suriname has also accessed regional support from PAHO for health sector resilience, most recently during the COVID-19 pandemic. In 2017, via a partnership with ECHO and the UNDRR (previously UNISDR), Suriname produced and published its Disaster Risk Reduction Country Document which provides the national risk context. In May 2020, the Government of Suriname accessed funding amounting to USD 412,000 from the World Bank to support national response to COVID-19¹²⁶.

¹²² Lacambra et al. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC.

¹²³ IDB, Technical Note; 1454. 2018. Indicators for Disaster Risk and Risk Management Program for Latin America and the Caribbean – Suriname.

¹²⁴ CDEMA. 2013. Community Emergency Response Team (CERT) Training. https://www.cdema.org/index.php?option=com_content&view=article&id=1185:community-emergency-response-team-cert-training&catid=35:press-releases

¹²⁵ CDB. 2020. Government of Canada and CDB Establish New Fund to Support Disaster Risk Management. <https://www.caribank.org/newsroom/news-and-events/government-canada-and-cdb-establish-new-fund-support-disaster-risk-management>

¹²⁶ World Bank. 2020. World Bank Supports COVID-19 Medical Response in Suriname. <https://www.worldbank.org/en/news/press-release/2020/05/05/world-bank-supports-covid-19-medical-response-in-suriname>

7. Impacts and Institutional Response to COVID-19

In January 2020, the World Health Organization (WHO) categorised the then Novel Coronavirus as a Public Health Emergency of International Concern. Not long after, on March 11, 2020, the WHO declared it a pandemic. On March 13, 2020, Suriname recorded its first case of the virus. As at April 11, 2022, Suriname recorded a total number of positive cases of 79,241 and 1325 deaths¹²⁷. As COVID-19 infections began to be reported around the world, like many countries, Suriname responded by instituting lockdown measures, closing schools, non-essential workplaces and international borders in order to contain the spread of the virus.

Lockdown measures, while aiding in minimising transmission, have had a substantial impact on interactive industries such as entertainment, restaurants, bars, retail, transportation, hotels, and home care services. Combined with the decline in commodity prices, travel restrictions and social distancing, these necessary measures have had a significant impact on poor and vulnerable groups. A 2020 study by the IDB posited that while unemployment effects cascaded into varying areas, the impacts were most significantly felt across services and sales workers and elementary occupations, who account for approximately one third of the employed population. The study highlighted that that 17.6% and 26.3% of people working in services and sales workers and elementary occupations were classified as poor while a further 19% of workers in the services and sales workers and elementary occupations were vulnerable to poverty. COVID-19 has therefore widened poverty and inequality gaps. To address these issues, the Government of Suriname instituted social support measures which included: enhanced supervision to prevent price speculation; advising companies not to dismiss employees during the crisis period; and the provision of packages of food and basic goods to vulnerable groups¹²⁸. These vulnerable groups also benefitted from remittances, although reduced.

In order to combat the pandemic, the Government of Suriname established a National Response Plan, which included the creation of a National COVID-19 Outbreak Management Team¹²⁹. Protocols for

sectors key sectors were also developed to minimise transmission risk. The Government of Suriname also established an Emergency Fund to finance measures to be taken in management of the pandemic, as well as to manage national and international resources obtained managing the crisis¹³⁰. With the advent of vaccines, countries are now better armed to manage the public health crisis and limit minimise its cascading impacts. The 2019 Global Health Security Index, considering a country's ability to prevent, detect, respond to health emergencies, along with its health capacity, norms and risks, places Suriname at a score of 36.5 (more prepared), below the global average of 40.2¹³¹. This shows that while good, there is still a need for strengthening health system resilience to better prevent, respond to and recover from pandemics and health emergencies.

¹²⁷ <https://www.worldometers.info/coronavirus/country/suriname/>

¹²⁸ Khadan, Jeetendra. 2020. COVID-19: Socio-economic implications on Suriname May 2020. IDB.

¹²⁹ Khadan, Jeetendra. 2020. COVID-19: Socio-economic implications on Suriname May 2020. IDB.

¹³⁰ <http://www.dna.sr/nieuws/wet-uitzonderingstoestand-covid-19-goedgekeurd/>

¹³¹ <https://www.ghsindex.org/country/suriname/>

8. Summary of Issues and Gaps

Suriname's disaster risk management framework, while growing, requires strengthening, especially in the context of the growing risks associated with climate change, commencing with governance arrangements. These areas are discussed in detail in previous sections but are summarised below:

Institutional Arrangements	<ul style="list-style-type: none">• Absence of approved disaster legislation• Lack of a CDM Policy• Lack of a dedicated disaster fund• Lack of adequate risk transfer mechanisms• Absence of Disaster Risk Financing Strategy• Absence of incentives for risk mitigation• Failure to integrate risk assessments into development planning• Inadequate coherence across national policies• Inadequate investment in the NCCR• Unoperationalised and unenforced building code• Development in hazard-prone areas
Capacity for response, recovery and rehabilitation for resilience	<ul style="list-style-type: none">• Coordination mechanism not formalised by law or policy• Unavailability of a recovery and reconstruction policy• Limited planning for biological hazards and capacity for pandemic response and recovery• Inadequate arrangements for the protection of critical infrastructure
Knowledge Management	<ul style="list-style-type: none">• Absence of a consolidated national risk database• Challenges with risk perception and limited public awareness initiatives• Absence of a formalised training strategy; fragmented initiatives• Limited capacity for data collection, analysis and dissemination• Inadequate integration of traditional knowledge• Inadequate integration of CDM into education curricula
Sectoral Mainstreaming	<ul style="list-style-type: none">• Sectoral involvement and responsibilities not mandated through law• Insufficient mainstreaming across all sectors• Insufficient investment for sectoral mainstreaming• Lack of continuity and contingency planning arrangements across priority sectors
Community Planning	<ul style="list-style-type: none">• Absence of a formal mechanism to integrate the community into the national DRM framework• Inadequate community early warning systems• Limited considerations for vulnerable groups including persons with disabilities, the elderly and indigenous and tribal peoples• Response-centred disaster plans

Figure 15: Summary of issues and gaps within the national disaster management context

9. Priority Areas for Action

The problems, issues and needs as revealed by this study have informed the recommendation of potential priority areas for revisions of the Country Work Programme as well other national and sectoral policies and strategies, in support of a resilient nation and the sustainable development agenda. Table 4 establishes these priority areas into outcomes and outputs for the policy environment. The finalisation of the Country Work Programme can present an opportunity to addressing these areas. Considerations for gender, climate change, ICT and environmental sustainability should be treated as cross-cutting themes, in keeping with the CDM Strategy and Programming Framework 2014-2024

OUTCOMES	OUTPUTS
1. Strengthened governance arrangements for disaster risk reduction.	1.1 Disaster management legislation revised, approved and operationalised to support disaster risk reduction.
	1.2 National Comprehensive Disaster Management Policy developed and implemented.
	1.3 Spatial Planning Act and Policy finalised and operationalised.
	1.4 National disaster management fund established.
	1.5 Increased arrangements for risk transfer at the state and subnational levels.
	1.6 Risk incentives for mitigation measures instituted.
	1.7 Risk assessments integrated through development planning and a legislative mechanism instituted to restrict development in high-risk zones.
	1.8 Strengthened arrangements for policy coherence.
	1.9 Increased investment in the NCCR for disaster risk reduction activities.
	1.10 Building code enforced for risk mitigation.
	1.11 National Environmental Act revised and enhanced to integrate disaster risk analyses.
	1.12 Disaster Risk Financing Strategy developed and instituted with considerations for risk retention and risk transfer measures.
2. Enhanced capacity for response, recovery and rehabilitation.	2.1 Coordination mechanism for stakeholders formalised through disaster management law and/or policy.
	2.2 Recovery and reconstruction policy developed and implemented with considerations for building back better.
	2.3 Critical infrastructure policy and protection strategy developed and operationalised.
	2.4 Enhanced preparedness for biological hazards and pandemics.
	2.5 Enhanced Multi-Hazard Early Warning System.
	2.6 Improved business continuity planning for key sectors and government agencies.

OUTCOMES	OUTPUTS
3. Increased and sustained knowledge for disaster risk reduction.	3.1 Comprehensive national risk database developed and instituted through the DRIMS.
	3.2 Public awareness and outreach strategy formalised for risk awareness and planning.
	3.3 Formal training strategy developed and instituted.
	3.4 Strengthened capacity for data collection, analysis and dissemination for risk-informed action.
	3.5 Traditional knowledge mainstreamed into disaster risk reduction initiatives.
	3.6 Disaster risk reduction mainstreamed into education curricula.
	3.7 Enhanced capacities for risk mapping and modelling.
4. Disaster risk reduction mainstreamed into sectors.	4.1 Disaster risk reduction strategies integrated into priority sectors.
	4.2 Sectoral responsibilities for disaster risk reduction mandated through law.
	4.3 Increased investment for sectoral mainstreaming.
5. Strengthened community resilience.	5.1 Community involvement in disaster risk reduction formalised through policy and law.
	5.2 Community early warning systems enhanced and expanded for multiple hazards.
	5.3 Enhanced arrangements for and inclusion of vulnerable groups including persons with disabilities, the elderly and indigenous and tribal peoples, and considerations for gender.
	5.4 District disaster plans strengthened with considerations for mitigation, preparedness, response and recovery, and tested.

Table 4: Potential Areas for Action

These proposed interventions should be deliberated through stakeholder consultations to agree on the priority areas for national policies and strategies and further elaborate the activities, timeframes, budgets and indicators for implementation of activities in support of the outcomes.

Addressing Systemic Risk

COVID-19 has reinforced the need for systemic risk planning. Hazards and their impacts are not isolated. Climate change further states the case for systemic risk planning, with current and projected impacts cascading across sectors and systems. Countries are now challenged to strengthen risk governance for risk-informed sustainable development that is underpinned by the understanding of systemic risk and the integration of systems-based approaches across governance arrangements and tools¹³². In its path to recovery and realigning actions to strengthen resilience, Suriname is called to strengthen efforts to advance systemic risk planning including:

1. Improving mechanisms to access, analyse, visualise and share data

In keeping with the Global Risk Assessment Framework and the Sendai Framework, systemic risk planning must be supported by data across sectors and systems. Understanding systemic risk calls for multi-stakeholder dialogue and collaboration that enables the consolidation of risk data (including the complex nature of vulnerability, hazards and exposures) in support of improved analytical approaches to understanding the dynamic and interconnected nature of risk, and the cascading impacts across sectors and systems¹³³.

2. Improving inter-disciplinary, cross-sectoral, and multi-stakeholder involvement in disaster risk reduction

Beyond the need for multi-stakeholder involvement in risk data compilation, is the need for strengthened institutional mechanisms that create a platform for enhanced cooperation across stakeholders for actions geared towards addressing the underlying risk drivers. Institutional mechanisms must therefore support collaboration across state (inter-ministerial and sectoral collaboration at national and subnational levels) and non-state actors, including civil society, private sector, academia, and the media.

¹³² ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report.

¹³³ ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report

Systemic risk planning calls for a paradigm shift from recognising the national disaster offices as the main entity for risk reduction, to mainstreaming risk reduction and management across the spectrum of stakeholders.

3. Strengthening efforts to mainstream disaster risk reduction into development planning

Mainstreaming risk reduction into development planning supports risk-informed policies and actions across sectors for systemic risk planning¹³⁴. Development pillars and sectors must integrate risk planning into activities in support of resilience. Key sectors such as health, tourism, education, transportation, housing, urban development, agriculture, water, etc. must be equipped with the necessary capacities to promote mainstreaming so as to address the underlying drivers of risk that contribute to system failure when risk is realised.

4. "Building back better" and integrating risk into recovery plans¹³⁵

In its path to recovery from the direct and cascading impacts of COVID-19, Suriname is provided with a meaningful opportunity to advance recovery efforts underpinned by the principles of building back better, tackling the interconnected drivers that create systemic risks. It is critical that recovery tools and actions acknowledge the need systemic risk planning, propelling the paradigm shift from response to risk management, integrating mitigation, preparedness and monitoring into disaster risk management processes¹³⁶.

¹³⁴ ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report

¹³⁵ ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report

¹³⁶ ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report

5. Understanding existing capacities and gaps, and strengthening arrangements

Finally, adopting and promoting systemic risk planning must first commence with an indepth assessment of national capacities, policies and frameworks, and understanding where there may be shortfalls. In recovery from the fallout of the pandemic and in strengthening resilience for future risks, countries must commence with a review of existing institutional and governance mechanisms to understand the barriers to effective systemic risk planning. Suriname is presented with an opportunity to ensure systemic planning for risk. This report provides useful information that can support Suriname in understanding some of its existing capacities and areas for intervention to advance systemic risk planning efforts.

10. Conclusion

Suriname's focus on disaster risk management is increasing, but so too is the national risk profile. By adopting the Sendai Framework, Suriname has committed itself to address disaster risk reduction within the context of sustainable development and poverty eradication, and to integrate disaster risk reduction into policies, plans, programmes and budgets at all levels. Mainstreaming disaster risk reduction must be driven from within key development sectors to ensure that specific sectoral vulnerability can be assessed. Also critical, is the institutionalisation of risk management into development planning. However, challenges exist, mainly due to the absence of the required enabling legislative environment and limited resource capacities.

Climate change continues to be an underlying threat to the country and it is expected that natural hazards will intensify over the years. These, in addition to anthropogenic hazards and the growing global nature of hazard risk, create financial pressures for individuals, households, businesses and the state at large. These hazards when realised, erode years of development progress. The main underlying drivers of risk include poverty, ecosystem decline, and inadequate development planning. COVID-19 has further underlined the fragile socioeconomic condition and has deepened the vulnerabilities of already vulnerable groups- the poor and marginalised communities. Building resilience, therefore demands efforts to address areas such as poverty reduction, human security improvement, dependency and literacy, social disparities, unemployment, inflation, debt, and environmental deterioration reduction¹³⁷.

Despite Suriname's growing attention to disaster risk management, an urgent paradigm shift is needed with a focus on preparedness and risk reduction instead of post-disaster response. Furthermore, policy coherence must be strengthened through national development strategies and policies, and efforts can be made in linking country's institutional arrangements, budgetary resources and programmes needed to address risks. Suriname's National Development Plan 2017-2021, establishes the country's development priorities, recognising the need to tackle disaster risk. The Plan commits to the development of a disaster risk reduction strategy that will steer Suriname on a path to resilience. This is best achieved through policy coherence underpinned by systemic risk governance, and simultaneously investing in integrated initiatives for mainstreaming into development processes.

¹³⁷ IDB. 2018. Technical Note No IDB-TN-1454, Indicators for Disaster Risk and Risk Management. Program for Latin-America and the Caribbean: Suriname.

References

"About Us | General Bureau of Statistics". 2021. *General Bureau Of Statistics*. <https://statistics-suriname.org/en/about-us/>.

"Disasters & Conflicts: Suriname. Domestic War, 1986-1992 - Humanity House". 2021. *Humanity House*. <https://humanityhouse.org/en/rampen-conflicten-suriname-binnenlandse-oorlog-1986-1992/>.

"List And Interactive Map Of The 100 Biggest Earthquakes In Suriname Since 1900". 2021. *Volcanodiscovery.Com*. Accessed September 4. <https://www.volcanodiscovery.com/earthquakes/suriname/largest.html>.

"Over Ons – Planning Office Suriname – SPS". 2021. *Planningofficesuriname.Com*. <https://www.planningofficesuriname.com/over-ons/>.

"Starnieuws - Zevende Lichaam Uit Goudmijn Geborgen". 2021. *Starnieuws.Com*. <https://www.starnieuws.com/index.php/welcome/index/nieuwsitem/3490>.

"Suriname - GHS Index". 2021. *GHS Index*. <https://www.ghsindex.org/country/suriname/>.

"Suriname | GFDRR". 2021. *Gfdr.org*. <https://www.gfdr.org/en/suriname>.

"Suriname: Floods - Apr 2021". 2021. *Reliefweb*. <https://reliefweb.int/disaster/fl-2021-000068-sur>.

"Thousands Of Villagers Stranded In Suriname - IFRC". 2021. *Ifrc.Org*. <https://www.ifrc.org/ar/news-and-media/news-stories/americas/surinam/thousands-of-villagers-stranded-in-suriname/>.

"Unemployment, Total (% Of Total Labor Force) (National Estimate) - Suriname | Data". 2021. *Data.Worldbank.Org*. <https://data.worldbank.org/indicator/SL.UEM.TOTL.NE.ZS?locations=SR>.

"Wet Uitzonderingstoestand COVID-19 Goedgekeurd - De Nationale Assemblée". 2021. *Dna.Sr*. <http://www.dna.sr/nieuws/wet-uitzonderingstoestand-covid-19-goedgekeurd/>.

----. <https://covid-19.sr/>.

----. *Surinameredd.Org*. <https://www.surinameredd.org/media/3301/sesa-report-1.pdf>

Algemeen Bureau voor de Statistiek (ABS). 2013. *Suriname Census 2012*.

Algemeen Bureau voor de Statistiek (ABS). 2018. 8th Environmental Statistics Publication. Paramaribo, Suriname. https://www.statistics-suriname.org/wp-content/uploads/2019/03/revised-FINAL_Milieupub_6dec2018-tvs-Suriprint.pdf

Algemeen Bureau voor de Statistiek (ABS). 2020. 9th Environmental Statistics Publication. Paramaribo, Suriname. <https://statistics-suriname.org/wp-content/uploads/2021/03/Final-9th-environment-pub-2020.pdf>

As recorded by Stichting voor Bosbeheer en Bostoezicht (SBB). In English: Foundation for Forest Management and Production Control

Bijnaar, Aspha E. 2008. *NWIG: New West Indian Guide / Nieuwe West-Indische Gids* 82, no. 1/2: 177-79.

Buitelaar, R., Kambon, A., Hendrickson, M., Blommestein, E. 2007. *Suriname: the impact of the May 2006 floods on sustainable livelihoods*. LC/L/2690-P/LC/CAR/L.114, 2007. https://repositorio.cepal.org/bitstream/handle/11362/5039/1/S0700163_en.pdf

Cardona, Omar-Dario and Maarten K. van Aalst. 2012. Determinants of risk: exposure and vulnerability. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.

Caribbean Development Bank (CDB). 2020. Government of Canada and CDB Establish New Fund to Support Disaster Risk Management. <https://www.caribank.org/newsroom/news-and-events/government-canada-and-cdb-establish-new-fund-support-disaster-risk-management>

Caribbean Disaster Emergency Management Agency (CDEMA). 2013. Community Emergency Response Team (CERT) Training. https://www.cdema.org/index.php?option=com_content&view=article&id=1185:community-emergency-response-team-cert-training&catid=35:press-releases

Caribbean Disaster Emergency Management Agency (CDEMA). Country Work Programme for Comprehensive Disaster Management.

Charvériat, C. 2001. Natural Disasters in Latin America and the Caribbean: An Overview of Risk. Inter-American Development Bank Research department Working Paper #434. <http://www.iadb.org/res/publications/pubfiles/pubWP-434.pdf>

ECLAC, UNDRR. 2021. The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean. COVID-19 Report.

Erftemeijer, P. and Teunissen, P. 2009. ICZM Plan Suriname-Mangrove Report: Analysis of Problems and Solutions for the Management of Mangrove Forests along Suriname's 'Wild Coast'. http://www.academia.edu/2169366/ICZM_Plan_Suriname-Mangrove_Report

ERM. 2017. Hazard and Risk Study for Paramaribo.

Flanagan, Barry E., Edward W. Gregory, Elaine J Hallisey, Janet L. Heitgerd, and Brian Lewis. 2011. "A Social Vulnerability Index For Disaster Management". Journal Of Homeland Security And Emergency Management 8 (1). doi:10.2202/1547-7355.1792.

Government of Suriname, Suriname National Implementation Plan to the Stockholm Convention. <http://www.pops.int/Countries/CountryProfiles/tabid/4501/Default.aspx>

Government of Suriname. 2006, Suriname National Chemical Profile, 2006. https://cwm.unitar.org/national-profiles/publications/cw/np/np_pdf/Suriname_National_Profile.pdf

Government of Suriname. 2015. Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021. http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf

Government of Suriname. 2017. Policy Development Plan 2017-2021 <http://www.planningofficesuriname.com/wpcontent/uploads/2018/02/2017-2021-DEVELOPMENT-PLAN.pdf>

Government of Suriname. 2018. Forest Reference Emission Level for Suriname's REDD+ Programme. Paramaribo, Suriname.

Government of Suriname. 2018. Forest Reference Emission Level for Suriname's REDD+ Programme. Paramaribo, Suriname.

Government of Suriname. 2018. Suriname Progress report on the implementation of the Montevideo Consensus 2013-2018

Government of Suriname. 2019a. Suriname Nationally Determined Contribution 2020, submitted to the UNFCCC in 2019. <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Suriname%20Second/Suriname%20Second%20NDC.pdf>

Government of Suriname. 2020. National Adaptation Plan 2019-2029. https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf

Government of Suriname. 2021. Suriname State of the Environment Report.

Government of the Republic of Suriname, 2016. Second National Communication to the United Nations Framework Convention on Climate Change. Berrenstein, H.J. and M.C.A. Gompers-Small (eds.). Paramaribo, Suriname: Office of the President of the Republic of Suriname.

Government of the Republic of Suriname. 2019b. National REDD+ Strategy of Suriname. Paramaribo, Suriname.

Heemskerk, M. and Oliveira, M. 2003. Perceptions of small-scale gold mining impacts: Results from focus group discussions in mining camps and affected communities. Tapanahonie & Brokopondo Regions, Suriname. Report for WWF-Guianas.

IFRC. 2021. Suriname: Floods 6/2021. <https://go.ifrc.org/reports/14350>

ILO. 2020. Employability of people with disabilities in Suriname - A baseline study by the International Labour Organization and the Ministry of Labour, Suriname International Labour Organization, Office for the Caribbean - Port of Spain.

Inform Index for Risk Management. 2021. <https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk>

Inter-American Development Bank (IDB) Technical Note; 1454. 2018. Indicators for Disaster Risk and Risk Management Program for Latin America and the Caribbean – Suriname. <https://publications.iadb.org/publications/english/document/Indicators-for-Disaster-Risk-and-Risk-Management-Program-for-Latin-America-and-The-Caribbean-Suriname.pdf>

Inter-American Development Bank (IDB) with Electricity Company of Suriname, the Central Bank of Suriname, Survey of Living Conditions in 2016/2017.

Inter-American Development Bank (IDB), Central Bank of Suriname and EnergieBedrijven Suriname (EBS). 2017. Suriname Survey of Living Conditions 2016-2017. <https://publications.iadb.org/en/suriname-survey-living-conditions-2016-2017>

Inter-American Development Bank (IDB). 2011. Suriname will improve social protection system with IDB support. <https://www.iadb.org/en/news/news-releases/2011-12-07/surinam-will-improve-social-protection-system%2C9745.html>

Khadan, Jeetendra. 2020. COVID-19: Socio-economic implications on Suriname May 2020. Inter American Development Bank (IDB). <https://publications.iadb.org/publications/english/document/COVID-19-Socioeconomic-Implications-on-Suriname.pdf>

Khadan, Jeetendra. 2020. Suriname in Times of COVID-19: Navigating the Labyrinth. Inter-American Development Bank. <https://publications.iadb.org/publications/english/document/Suriname-in-Times-of-COVID-19-Navigating-the-Labyrinth.pdf>

Khadan, Jeetendra. 2021. Weblog Strengthening Economic Institutions to Support Suriname's Public Finance. Inter-American Development Bank. <https://blogs.iadb.org/caribbean-dev-trends/en/strengthening-economic-institutions-to-support-surinames-public-finances/>

Lacambra S., A. Moredjo, C. Osorio, A. M. Torres, and E. Visconti. 2021. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): National Report for Suriname. ECLAC. <https://publications.iadb.org/en/index-governance-and-public-policy-disaster-risk-management-igopp-national-report-suriname>

Ministry of Agriculture, Animal Husbandry and Fisheries. 2008. Suriname's Fifth Agriculture Census.

Ministry of Agriculture, Livestock and Fisheries 2016. National Master Plan for Agricultural Development 2016. <http://www.share4dev.info/kb/documents/5426.pdf>

Ministry of Agriculture, Livestock and Fisheries. 2019. Agriculture Disaster Risk Management Plan.

Ministry of Health, Suriname National Health Sector Plan 2011-2018. http://sisco.copolad.eu/web/uploads/documentos/National_Health_Plan_11-18_Suriname.pdf

Ministry of Home Affairs, Bureau Gender Affairs. 2019. Suriname Report National Review Implementation of the Beijing Declaration and Platform for Action + 25

Ministry of Labour, Technological Development and Environment .2013. The National Biodiversity Action Plan (NBAP) 2012-2016. <https://www.cbd.int/doc/world/sr/sr-nbsap-v2-en.pdf>

Ministry of Social Affairs and Public Housing. 2019. Suriname Multiple Indicator Cluster Survey 2018, Survey Findings Report <https://statistics-suriname.org/wp-content/uploads/2019/08/Suriname-MICS-6-Survey-Findings-Report.pdf#page=267>

Ministry of Spatial Planning and Environment. 2021. Suriname State of the Environment Report.

Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. <https://www.surinameredd.org/media/1183/ddfdbplus-study-inception-report.pdf>

National Institute for Environment and Development (NIMOS), SBB and UNIQUE. 2017. Background study for REDD+ in Suriname: Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. Paramaribo, Suriname.

National Institute for Environment and Development (NIMOS). 2019. Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname. <https://www.surinameredd.org/media/3301/sesa-report-1.pdf>

Noordam, D. 2007. Promotion of Sustainable Livelihood within the Coastal Zone of Suriname, with Emphasis on Greater Paramaribo and the Immediate Region. Sector: Geomorphology and Soils. Netherlands Country Assistance Program, Phase 2 (NCAP-2). Ministry of Labour, Technological Development and Environment. PAHO. 2021. Suriname receives its first COVID-19 vaccines through the COVAX Facility. <https://www.paho.org/en/news/26-3-2021-suriname-receives-its-first-covid-19-vaccines-through-covax-facility>

Rahm M., Jullian B., Lauger A., de Carvalho R., Vale L., Totaram J., Cort K.A., Djojodikromo M., Hardjoprajitno M., Neri S., Vieira R., Watanabe E., do Carmo Brito M., Miranda P., Paloeng C., Moe Soe Let V., Crabbe S., Calmel M.. 2015. Monitoring the Impact of Gold Mining on the Forest Cover and Freshwater in the Guiana Shield. Reference year 2014. REDD+ for the Guiana Shield Project and WWF Guianas.

Ritchie, Hannah, Edouard Mathieu, Lucas Rodés-Guirao, Cameron Appel, Charlie Giattino, Esteban Ortiz-Ospina, Joe Hasell, Bobbie Macdonald, Diana Beltekian, and Max Roser. 2021. "Coronavirus Pandemic (COVID-19)". *Our World In Data*. <https://ourworldindata.org/coronavirus/country/suriname>.

Schmeitz Maggie. 2017. Disaster Risk Reduction Country Document for Suriname, 2014. National Coordination Center For Disaster Relief (NCCR).

Schwartz M. and Beuermann D. 2021. Economic Institutions for a Resilient Caribbean. Inter-American Development Bank.

Stichting voor Bosbeheer en Bostoezicht (SBB). In English: Foundation for Forest Management and Production Control. Background study for REDD+ implementation in Suriname: United Nations Development Program (UNDP). (2016). Suriname Global Climate Change Alliance (GCCA+) project document

United Nations Development Programme (UNDP). 2009. Case Study on the Impact of Climate Change on Agriculture and Housing on Indigenous Communities in Suriname and Barbados.

United Nations Development Programme (UNDP). 2019. Global Climate Change Alliance (GCCA+) Suriname Adaptation Project Increasing Suriname's resilience against the negative impacts of Climate change. New York.

United Nations Development Programme (UNDP). 2020. Human Development Report 2020.

United Nations Development Programme (UNDP). 2019. Suriname National Mangrove Strategy. https://www.sr.undp.org/GCCA/Mangrove_SR

United Nations General Assembly. 2016. Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.

United Nations Office for Disaster Risk Reduction. 2015. Sendai Framework for Disaster Risk Reduction. United Nations.

United Nations Office for Disaster Risk Reduction. 2020. Hazard Definition & Classification Review Technical Report.

Weekes C. and Bello O. D. 2019. Mainstreaming disaster risk management strategies in development instruments (II): Policy briefs for Barbados, Guyana, Saint Lucia, Suriname, and Trinidad and Tobago", Studies and Perspectives Series—ECLAC Subregional Headquarters for the Caribbean, No. 75 (LC/TS.2019/7; LC/CAR/TS.2018/3) ECLAC.

World Bank. 2017. Paramaribo Strategic Flood Risk Assessment. <http://documents1.worldbank.org/curated/en/463821538552629012/pdf/Suriname-FRA-REPORT-FINAL.pdf>

World Bank. 2019. Project Appraisal Document for the Saramacca Canal System Rehabilitation Project

World Bank. 2020. World Bank Supports COVID-19 Medical Response in Suriname. <https://www.worldbank.org/en/news/press-release/2020/05/05/world-bank-supports-covid-19-medical-response-in-suriname>

World Health Organization. 2018. Country Cooperation Strategy: Suriname.

Appendix

Appendix I: Risk Components

RISK COMPONENT: Hazards

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
Hydro-meteorological	Flood	Coastal Riverine Flash	<p>Policy Development Plan 2017-2021 http://www.planningofficesuriname.com/wpcontent/uploads/2018/02/2017-2021-DEVELOPMENT-PLAN.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021_ http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR</p> <p>IDB, 2018, Indicators for Disaster Risk and Risk Management Program for Latin America and the Caribbean - Suriname https://publications.iadb.org/publications/english/document/Indicators-for-Disaster-Risk-and-Risk-Management-Program-for-Latin-America-and-The-Caribbean-Suriname.pdf</p> <p>9th Environmental Statistics Publication 2015-2019 https://statistics-suriname.org/wp-content/uploads/2021/03/Final-9th-environment-pub-2020.pdf</p> <p>https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf</p>

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
		Landslide	Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname https://www.surinameredd.org/media/3301/sesa-report-1.pdf
	Pressure-related	(Sub)tropical Storm	Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf
	Marine	Sea water intrusion	Policy Development Plan 2017-2021: http://www.planningofficesuriname.com/wpcontent/uploads/2018/02/2017-2021-DEVELOPMENT-PLAN.pdf Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR
		Storm surge	Policy Development Plan 2017-2021: http://www.planningofficesuriname.com/wpcontent/uploads/2018/02/2017-2021-DEVELOPMENT-PLAN.pdf Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
			<p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p>
	Wind-related	Wind	<p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p>
	Precipitation-related	Drought	<p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Results-and-data/moduleId/1782/id/433/controller/Admin/action/Results</p> <p>https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf</p>
Geological	Seismogenic	Earthquake	https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Results-and-data/moduleId/1782/id/433/controller/Admin/action/Results
Environmental	Environmental degradation	Air pollution	<p>Suriname National Implementation Plan to the Stockholm Convention http://www.pops.int/Countries/CountryProfiles/tabid/4501/Default.aspx</p>

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
			<p>Suriname National Chemical Profile, 2006 https://cwm.unitar.org/national-profiles/publications/cw/np/np_pdf/Suriname_National_Profile.pdf</p>
		Land and soil degradation	<p>ASGM National Action Plan https://www.thegef.org/project/artisanal-and-small-scalegold-mining-asgm-national-action-plan-nap-suriname</p> <p>Background study for REDD+ implementation in Suriname: Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. https://www.surinamredd.org/media/1183/ddfdbplus-study-inception-report.pdf</p> <p>Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname https://www.surinamredd.org/media/3301/sesa-report-1.pdf</p> <p>https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf</p>
		Salinity	<p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR</p>

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
		Biodiversity loss	<p>Policy Development Plan 2017-2021: http://www.planningofficesuriname.com/wpcontent/uploads/2018/02/2017-2021-DEVELOPMENT-PLAN.pdf</p> <p>The National Biodiversity Action Plan (NBAP) 2012-2016. https://www.cbd.int/doc/world/sr/sr-nbsap-v2-en.pdf</p>
		Deforestation	<p>Background study for REDD+ implementation in Suriname: Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. https://www.surinameredd.org/media/1183/ddfdbplus-study-inception-report.pdf</p> <p>Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname https://www.surinameredd.org/media/3301/sesa-report-1.pdf</p> <p>National Geoportal Gonini: http://gonini.org/</p> <p>https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf</p>
		Invasive species	<p>The National Biodiversity Action Plan (NBAP) 2012-2016. https://www.cbd.int/doc/world/sr/sr-nbsap-v2-en.pdf</p>
		Loss of mangroves	<p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p>

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
			<p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR</p> <p>National Geoportal Gonini: http://gonini.org/</p>
		Wetland loss/ degradation	<p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR</p> <p>National Geoportal Gonini: http://gonini.org/</p>
		Coastal erosion and shoreline change	<p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>National Geoportal Gonini: http://gonini.org/</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p>

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
			<p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR</p> <p>National Geoportal Gonini: http://gonini.org/ https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf</p>
		Sand mining	National Geoportal Gonini: http://gonini.org/
		Sea-level rise	<p>Policy Development Plan 2017-2021: http://www.planningofficesuriname.com/wpcontent/uploads/2018/02/2017-2021-DEVELOPMENT-PLAN.pdf</p> <p>Suriname Nationally Determined Contribution 2020, submitted to the UNFCCC in 2019 https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Suriname%20Second/Suriname%20Second%20NDC.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › MangroveSR https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf</p>

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
Chemical	Heavy metals	Mercury Lead Cadmium	National Profile https://cwm.unitar.org/national-profiles/publications/cw/np/np_pdf/Suriname_National_Profile.pdf
	Persistent Organic Pollutants		Suriname's National Implementation Plan to the Stockholm Convention http://www.pops.int/Implementation/NationalImplementationPlans/NIPTransmission/tabid/253/ctl/Download/mid/13657/Default.aspx?id=167&ObjID=14154 https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf
	Hydrocarbons	Oil pollution	https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf
	Other	Asbestos	National Profile https://cwm.unitar.org/national-profiles/publications/cw/np/np_pdf/Suriname_National_Profile.pdf
Biological	Invasive species	Invasive species	National Biodiversity Action Plan 2012-2016: https://www.cbd.int/doc/world/sr/sr-nbsap-v2-en.pdf National Master Plan for Agricultural Development 2016: http://www.share4dev.info/kb/documents/5426.pdf
	Mental health	Suicide cluster	https://crpd.cepal.org/3/sites/crpd3/files/national_report_suriname.pdf
	Infectious diseases		Suriname National Health Sector Plan 2011-2018 http://sisco.copolad.eu/web/uploads/documentos/National_Health_Plan_11-18_Suriname.pdf Socio-Economic Impact Assessment and Response Plan for COVID-19 in Suriname https://www.undp.org › undp › library › covid19 Suriname National Health Sector Plan 2011-2018 http://sisco.copolad.eu/web/uploads/documentos/National_Health_Plan_11-18_Suriname.pdf

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
			https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Results-and-data/moduleId/1782/id/433/controller/Admin/action/Results https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf
Technological	Infrastructure failure	Power outage/ or blackout	<p>Suriname Nationally Determined Contribution 2020, submitted to the UNFCCC in 2019 https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Suriname%20Second/Suriname%20Second%20NDC.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p>
		Water supply failure	<p>Suriname Nationally Determined Contribution 2020, submitted to the UNFCCC in 2019 https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Suriname%20Second/Suriname%20Second%20NDC.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p>
		Mining hazards	Suriname National Adaptation Plan 2019-2029

HAZARD CATEGORY	HAZARD CLUSTER	HAZARDS IDENTIFIED	SOURCE
	Industrial Failure / Non-compliance		https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf ASGM National Action Plan https://www.thegef.org/project/artisanal-and-small-scalegold-mining-asgm-national-action-plan-nap-suriname Background study for REDD+ implementation in Suriname: Multi-perspective analysis of drivers of deforestation, forest degradation and barriers to REDD+ activities. https://www.surinameredd.org/media/1183/ddfdbplus-study-inception-report.pdf
		Contamination Spills Explosion Fire	Suriname National Chemical Profile, 2006 https://cwm.unitar.org/national-profiles/publications/cw/np/np_pdf/Suriname_National_Profile.pdf http://www.racrempeitc.org/sites/default/files/Attachments/Signed%20NOSCP%20of%20Suriname.pdf
	Waste		https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf Suriname National Chemical Profile, 2006 https://cwm.unitar.org/national-profiles/publications/cw/np/np_pdf/Suriname_National_Profile.pdf
	Transportation	Air Transportation Road Traffic	https://www.preventionweb.net/files/53917_53917finalcountryreportsuriname.pdf
Societal	Conflict	Civil unrest	https://humanityhouse.org/en/rampen-conflicten-suriname-binnenlandse-oorlog-1986-1992/
	Economic	Financial shock	https://publications.iadb.org/publications/english/document/Suriname-in-Times-of-COVID-19-Navigating-the-Labyrinth.pdf

RISK COMPONENTS: Vulnerability and Exposure

RISK COMPONENT	SOURCE
Social Vulnerability	<p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname https://www.surinameredd.org/media/3301/sesa-report-1.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org/GCCA/Mangrove_SR</p>
Physical Vulnerability	<p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname https://www.surinameredd.org/media/3301/sesa-report-1.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org/GCCA/Mangrove_SR</p> <p>Weekes and Bello. Mainstreaming disaster risk management strategies in development instruments (II): Policy briefs for Barbados, Guyana, Saint Lucia, Suriname, and Trinidad and Tobago. ECLAC at https://www.cepal.org/en/publications/44472-mainstreaming-disaster-risk-management-strategies-development-instruments-ii</p>

RISK COMPONENT	SOURCE
	<p>Suriname National Adaptation Plan 2019-2029 https://www4.unfccc.int/sites/NAPC/Documents/Parties/Suriname%20Final%20NAP_apr%202020.pdf</p> <p>Final National Climate Change Policy, Strategy and Action Plan for Suriname 2014-2021 http://www.caribbeanelections.com/eDocs/strategy/sr_strategy/sr_Climate_Change_Policy_Strategy_Action_Plan_2014_2021.pdf</p> <p>Report of the Strategic Environmental and Social Assessment (SESA) accompanying the development of the National REDD+ Strategy of the Republic of Suriname https://www.surinameredd.org/media/3301/sesa-report-1.pdf</p> <p>The National Mangrove Strategy https://www.sr.undp.org › GCCA › Mangrove_SR</p> <p>https://crpd.cepal.org/3/sites/crpd3/files/national_report_suriname.pdf</p>

