Global Shield In-Country Process
Climate and Disaster Risk Finance and Insurance in Costa Rica

Stocktake and Gap Analysis Report

Prepared by: The General Insurance Superintendency of Costa Rica

Ministry of Finance Government of Costa Rica

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Contents

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A comprehensive review of a draft version of the Gap Analysis was undertaken by the Global Shield Technical Advisory Group (TAG), to ensure a thorough examination of its findings and methodologies, based on the available information provided at the time of review. This review process aimed to strengthen the analysis's relevance, further aligning it with Global Shield against Climate Risks principles according to the In Country Process Guidance Note and global best practices, whilst incorporating a diverse and inclusive perspective. The TAG's expert input has provided critical insights, identifying key areas for improvement and actionable recommendations to address gaps and opportunities within the Climate and Disaster Risk Finance and Insurance (CDRFI) framework. Their contributions have significantly strengthened the document, enhancing its credibility as a strategic resource for advancing CDRFI solutions. We extend our sincere gratitude to the TAG members for their invaluable expertise and dedication, including Joanne Meusz, Sophie Evans (members of the Centre for Disaster Protection as TAG coordinator) and Zoë Scott (Author) Gina Mosquera, Georgina Bedenham (both working on behalf of the UK Government Actuary's Department), Omaira Chaudhry and José Ángel Villalobos (TAG Permanent Group Members). It is important to note that the TAG Recommendations shared with the In-Country Coordinator are intended as guidance, and their application to revise the Gap Analysis remains at the discretion of Costa Rica. This approach respects national priorities and contexts while leveraging the TAG's expertise to inform potential improvements.

Abbreviations

A2ii: Access to Insurance Initiative
AAL: Average Annual Loss
ASADAS: Administrative Associations of the Communal Aqueducts and Sewerage Systems
ASSAL: Association of Insurance Supervisors of Latin America
AyA: Aqueducts and Sewers
BCCR: Central Bank of Costa Rica
CAPRA: Probabilistic Risk Assessment
CAT DDO: Catastrophe Deferred Drawdown Option
CATIE: Tropical Agricultural Research and Higher Education Centre
CCRIF: Caribbean Catastrophe Risk Insurance Facility
CCSS: Costa Rican Social Security Fund
CDRFI: Climate and Disaster Risk Finance and Insurance Instruments
CDRI: Coalition for Disaster Resilient Infrastructure
CEDAW: Committee on the Elimination of Discrimination Against Women
CENIGA: National Centre for Geo-Environmental Information
CFIA: Colegio Federado de Ingenieros y Arquitectos (National Association of Engineers and Architects)
CGR: Comptroller General of the Republic
CNE: National Commission for Risk Prevention and Emergency Response
CoE: Centre of Excellence on Gender-smart Solutions
CONAPAM: National Council of the Elderly
CONASSIF: National Council for the Supervision of the Financial System
COP: Conference of the Parties
CPSU: Centre for Urban Sustainability: CPSU
CRC: Colones
DCC: Climate Change Directorate
DERSA: Standardised Self-Issue Insurance Summary Document
DLP: Development Policy Loan
DRF: Disaster Risk Financing
DRFIP: Disaster Risk Financing and Insurance Programme
DRM: Disaster Risk Management
ENGFRD: National Disaster Risk Financing Strategy
ENSO: El Niño-Southern Oscillation
FEPI: Special Fund for Prevention and Infrastructure for Banana Production
FNE: National Emergency Fund (*Fondo Nacional de Emergencia*)
FONAFIFO: National Forestry Financing Fund
GAR: Global Assessment Report on Disaster Risk Reduction
GDP: Gross Domestic Product
GFDRR: Global Facility for Disaster Reduction and Recovery
GHGs: Greenhouse Gases
GIRI: Global Infrastructure Risk Model and Resilience Index
GIZ: German Development Cooperation
GRAF: Global Risk Assessment Framework
GRMA: Global Risk Modelling Alliance
HCI: Human Capital Index
IAIS: International Association of Insurance Supervisors
ICE: Costa Rican Institute of Electricity
ICLEI: Local Governments for Sustainability
ICT: Costa Rican Tourism Board
IDF: Insurance Development Forum
IDOM: Consulting, Engineering, Architecture
IFAM: Institute for Municipal Development and Consulting

IMAS: Joint Social Welfare Institute
IMN: National Meteorological Institute
INAMU: National Institute for Women
INEC: National Institute of Statistics and Census
INS: National Insurance Institute
ISF: InsuResilience Solutions Fund
JAPDEVA: Board of Port Administration and Economic Development of the Atlantic Coast
LAC: Latin America and the Caribbean
MAG: Ministry of Agriculture and Livestock
MIDEPLAN: Ministry of National Planning and Economic Policy
MINAE: Ministry of Environment and Energy
MISAL: Ministry of Health
MIVAH: Ministry of Housing and Human Settlements
MOPT: Ministry of Public Works and Transport
MSMEs: Micro, Small and Medium Enterprises
MTSS: Ministry of Labour and Social Security
NAP: National Adaptation Plan to Climate Change
NDC: Nationally Determined Contribution
OECD: Organisation for Economic Co-operation and Development
OPM: Oxford Policy Management
OVSICORI: Volcanological and Seismological Observatory of Costa Rica
PA: Paris Agreement
PANI: National Child Welfare Agency
PNACC: National Policy for Adaptation to Climate Change
PNDIP: National Development and Public Investment Plan
PNGR: National Risk Management Policy
PSA Payments for Environmental Services
PSI: Principles for Sustainable Insurance
RECOPE: Costa Rican State Oil Refinery
REDD: Reducing Emissions from Deforestation and Forest Degradation
SBD: Development Banking System
SDGs: Sustainable Development Goals
SEPLASA: Secretariat of Sectoral Planning for the Environment
SGSA: Consulting Service for Business Support
SIF: Sustainable Insurance Forum
SINIRUBE: National System of Information and Single Registry of State Beneficiaries
SMEs: Small and Medium Enterprises
SUGESE: General Insurance Superintendency
UCR: University of Costa Rica
UIIF: Urban Infrastructure Insurance Fund
UNA: National University of Costa Rica
UNDP: United Nations Development Programme
UNDRR: United Nations Office for Disaster Risk Reduction
UNFCCC: United Nations Framework Convention on Climate Change
VAT: Value Added Tax
WEF: World Economic Forum
WRI: World Resources Institute

Executive Summary

Due to its geographic location and geotectonic features, Costa Rica is highly exposed to geophysical and hydrometeorological phenomena. Disasters connected to these kinds of natural events have a social, economic and financial impact, with **77.9% of the population and 80.1% of the country's economic activity concentrated in areas of high disaster risk.** According to the risk profiles available for Costa Rica, **floods, tropical cyclones and earthquakes have been identified as the most frequent and severe hazards.** By 2030, annual losses associated with the aforementioned hazards, amongst others, could exceed USD 7 billion, and could reach almost USD 30 billion by 2050 (both figures adjusted to 2006 constant dollars)[1]. Such losses would have important repercussions on Costa Rica's economic and social development.

Based on consultations conducted as part of the Global Shield against Climate Risks In-Country Process in Costa Rica, **the following sectors were prioritised** as the most vulnerable to the impacts of climate change: **(1) critical infrastructure, (2) agriculture and fishing, (3) natural capital and (4) tourism**. In Costa Rica's infrastructure sector, for example, the annual cost of repairing and rebuilding infrastructure affected by floods, storms and droughts went from approximately USD 17.2 million in 1988 to USD 392.5 million in 2010, representing 1.01% of the country's GDP in the latter. At the same time, the **information available on the impact on the most vulnerable groups remains incomplete,** adding another layer of complexity to selecting appropriate tools and highlighting the importance of investing in an adaptive social protection system.

In response to the projected impact of climate change and the recurring effects of other kinds of hazards outlined in this analysis, the country implements a **risk-layered disaster risk financing strategy.** Each layer foresees a **combination of pre-established financial instruments** and budgetary tools to address impacts of disasters, such as **contingency funds** (the National Emergency Fund in Costa Rica's case) or **contingent credit products**, such as **catastrophic loans** (Loans with Catastrophe Deferred Drawdown Option, or Cat DDO), amongst others. At the top layer, which covers less frequent but very severe events, instruments such as **insurance and catastrophe bonds** are generally used, which tend to be more cost effective. In this regard, the country currently lacks adequate coverage for this layer. According to the disaster deficit indices, Costa Rica lacks sufficient resources of its own (the National Emergency Fund is inadequate), as well as viable risk transfer or financing options, to be able to address disaster-related losses and recover capital. Therefore, the country retains a significant portion of the losses, and, given investment needs and budgetary constraints, ex-post financing options carry a high opportunity cost.[1]

Whilst the Ministry of Finance is already working on planning the implementation of the National Disaster Risk Financing Strategy (ENGFRD), efforts have been made **to investigate the current financial protection gap at the national level.** Through a participatory and inclusive process, the following **four (4) protection gaps and barriers have been identified and prioritised:**

1. The insufficiency of the National Emergency Fund (FNE) and the absence of a strategy for its sustainability.
2. The lack of implementation of a complementary risk transfer instrument in critical infrastructure sectors and ecosystem services along with the lack of a methodology for informed selection of such an instrument. Furthermore, the absence of micro-level risk transfer products in the agricultural sector, intended for vulnerable households.
3. The need to strengthen the culture and technical capacities for modelling and managing risks within public and private institutes.
4. The need for a centralised, up-to-date and open-access national risk database platform that allows national actors to access data and use them to develop strategies and products.

To date, the information available has not allowed the current financial protection gap to be quantified. The Stocktake and Gap Analysis Report presents a stocktake of the information available on risk, the enabling environment in Costa Rica and existing protection in each of the three layers of financial risk management. Based on the stocktake, an extensive analysis of the existing gaps and barriers was conducted, as well as the opportunities and necessary interventions to close the financial protection gap.

1. Introduction

1.1 Aim of the report

The aim of the gap analysis report is to present the results obtained from a process of identifying existing financial protection needs, barriers and gaps, as well as possible intervention options/specific climate and disaster risk finance and insurance instruments to close the gaps identified in Costa Rica. The gap analysis is the result of a dialogue within the country, which facilitates understanding and decision-making by the Government, involving key stakeholders who participated in the two workshops and responded to the consultations.

Recognising the relevant strategies that already exist (the National Disaster Risk Financing Strategy, the Nationally Determined Contribution, the National Adaptation Plan to Climate Change), this report presents a roadmap that will help the country strengthen coordination of its climate and disaster risk financing management strategy.

1.2 Methodology

To conduct the gap analysis, the following steps were carried out[i]:

1. Analysis of information obtained and systematised in the First Workshop held as part of the Global Shield against Climate Risks Initiative Launch, where key actors for the In-Country Process were identified. Further, a review of the stocktake of the existing initiatives, consultations, studies, analyses and projects in Costa Rica related to CDRFI and preliminary identification of the state of financial protection were conducted.
2. Consultations and semi-structured interviews with key actors were complemented with desk-research and analysis of recent studies, reports and publications, amongst others.
3. Based on the information available, the following reviews and analyses were carried out:
    - Identification of strategic gaps and those within the political and institutional environment conducive to CDRFI instruments.
    - Comparative analysis of existing climate vulnerabilities with regard to current financial protection.
    - Identification of possible gaps or deficiencies in financial instruments that may be indicated at the sectoral level or for key risks.
    - Identification of possible deficiencies in the availability of high-quality climate and disaster risk analyses.

[i] No proprietary risk data were collected in the preparation of this report, nor were any new risk models developed.

4. Prioritisation of risks to be covered and recommendations to be developed

    - Based on the information available on the frequency/severity of exposure to the risk and feedback from stakeholders in bilateral interviews.
    - Based on the results of the analysis and the recommendations included in the existing analyses, taking into account the opportunities already identified.
    - Based on the analysis of the information obtained and systematised in the Country's Second Workshop, the preliminary gap analysis results were validated, and feedback was obtained from key stakeholders to identify priority sectors and to prepare the request for support.
    - Based on the feedback of the Executive Committee, which was made up of executive representatives from the Ministry of Finance, the National Commission for Risk Prevention and Emergency Response and the General Insurance Superintendency.

Methodology Limitations

This analysis is based on the information and data available. The quality of the results obtained has been affected by the lack of comparable and disaggregated quantitative data, particularly regarding average annual loss and probable maximum loss caused by different hazards.

Thanks to the methodology of the In-Country Process, multiple stakeholders were involved, and a participatory process was carried out. However, the report does not aim to encompass all available information, nor cover the results of all available recent research. The gap analysis is considered *work in progress* and welcomes additional contributions and relevant information.

1.3 Finance and insurance instruments to address climate and disaster risk in Costa Rica

Due to its geographic location and geotectonic features, Costa Rica is highly exposed to geophysical and hydrometeorological phenomena. Disasters caused by these natural events have a social, economic and financial impact. 77.9% of the population and 80.1% of the Gross Domestic Product (GDP) are concentrated in areas at high risk of natural disasters, highlighting the importance of improving the country's resilience through appropriate management of climate and disaster risks using financial protection mechanisms. This should encompass all phases of risk management - from prevention and reduction, preparedness, response and resilient recovery to risk transfer.

According to data from the *Contraloría General de la República* (CGR), **the annual cost of repairing and rebuilding infrastructure affected by floods, storms and droughts alone increased from approximately USD 17.2 million in 1988 to USD 392.5 million in 2010, representing 1.01% of the country's GDP in that year.** Additionally, the CGR predicts an exponential growth in the cost of repairing and rebuilding roads, bridges, aqueducts and other

critical infrastructure due to the more frequent and intense impacts of extreme hydrometeorological events[2].

For its part, the National Commission for Risk Prevention and Emergency Response (CNE) estimates that losses recorded between 2005 and 2017 amounted to USD 2.21 billion. Road infrastructure is the most affected sector, accounting for 55.28% of losses, followed by water resources at 15.23%, infrastructure for electrical systems, energy, telecommunications, railways and housing at 14.42% and the agricultural sector at 9.85%[3]. According to estimations by the World Bank, annual losses could amount to more than USD 7 billion by the year 2030, and almost USD 30 billion by 2050 (both figures adjusted to 2006 constant dollars)[4].

If the estimated losses were to materialise, there would be significant repercussions for the economic and social development of the country, given the recurring erosion of development assets, compounded by the differentiated impacts on sectors, territories, communities and vulnerable groups[5]. Hence, the importance of furthering risk analysis and hazard quantification, identifying financial protection gaps and determining which of these gaps should be closed as a matter of priority, as well as evaluating options for climate and disaster risk finance and insurance instruments (CDRFI, see Info Box 1), which will enable the country to close the priority gaps.

Info Box 1 Climate and Disaster Risk Finance and Insurance (CDRFI) Instruments

Climate and disaster risk finance and insurance refers to a set of financial instruments, concepts and pre-established mechanisms that seek to increase resilience and offer protection against climate and disaster risks. CDRFI is an integral component of a risk management approach that aims to reduce vulnerability to adverse events. Currently, financing intended for disaster response is predominantly reactive. To address these challenges, CDRFI is proposed as a proactive solution. These types of mechanisms provide financial instruments that ensure liquidity before or immediately after a disaster, mitigating its global impact by offering quick and reliable financing[6].

CDRFI options promote and improve the availability and certainty of financing, enabling rapid response to impacts of disasters and recovery efforts for countries; furthermore, they comprehensively help increase the capacity for more reliable planning by integrating these types of instruments into climate change adaptation and resilience policies, as well as disaster reduction policies[7].

Source: InsuResilience Secretariat (2021) Realizing Sustainable and Affordable Climate and Disaster Risk Finance and Insurance: SMART Premium and Capital Support

1.4 Background of the Global Shield against Climate Risks in Costa Rica

In February 2024, the Ministry of Finance formally requested the support of *Global Shield against Climate Risks*[8], simultaneously appointing the General Insurance Superintendency (SUGESE) as a technical focal point to lead, coordinate and oversee the process in the country. The Global Shield Secretariat provides support through an 'In-Country Process', the aim

of which is to identify specific protection gaps, needs and barriers as well as intervention options or pre-established insurance and financial instruments to address climate and disaster risk.

This is an inclusive process whose success depends on the involvement of all key stakeholders (see Annex 1 for the list of key stakeholders), taking into account their needs and perspectives on the risks that the country faces and possible financing alternatives.

The launch workshop for the '*Global Shield against Climate Risks*' initiative was held in Costa Rica in July 2024. The aim of this initial workshop was to involve key stakeholders through a participatory process in which they were informed about the initiative and its implementation in the country, its objectives and the support available for Costa Rica.

From the results of this workshop and with additional information gathered, the stocktake (see Annex 2: Stocktake) was completed. This stocktake served as the foundation for this financial protection gap analysis report.

2. General Country Profile

2.1 Geographical, meteorological and geophysical characteristics

Costa Rica is a small country with a land area of 51,079 Km^2. Its topography is diverse, including coastal plains separated by rugged mountains and more than 100 volcanic cones. Although it only represents 0.034% of the earth's surface, **it houses approximately 5% of the world's biodiversity which has made it a key ecotourism destination, with more than 26% of its land protected. The country is a key player in the conservation of biodiversity, promoting an environmental development model.**

The country is situated between the Tropic of Cancer and the Tropic of Capricorn, in the area known as the Tropics. This means that its forests, hydrographic network, soils and climate are tropical. The climate is influenced by factors such as the terrain (the arrangement of the mountains, plains and plateaus), its position relative to the continent (it is an isthmus), oceanic influences (winds or sea breezes, the temperature of ocean currents) and the general circulation of the atmosphere.

The north-westerly-southeasterly orientation of the mountain system divides Costa Rica into two coasts: the Pacific and the Caribbean. Each has its own rainfall and temperature patterns[9]. The Pacific coast is characterised by a marked dry season from November to April and a rainy season from May to October, whereas the Caribbean coast has a warmer and more humid climate, with rainfall all year round and less pronounced seasonal variations.

In addition to this variability throughout the year, the El Niño phenomenon (*El Niño-Southern Oscillation*, or ENSO) adds variability between different years. Extreme meteorological phenomena, such as storms, floods and droughts, can also be associated with ENSO. The years in which El Niño occurs usually tend to be associated with droughts on the Pacific coast, whereas La Niña years often result in more intense rainfall which affects the Caribbean coast in particular.

1,264 hydrometeorological events[ii] were recorded between 1980 and 2017, with 3 million people affected and 546 related deaths. 72.1% of the events corresponded to heavy rainfall, storms, convective storms and hail, representing the most frequent events with multiple impacts. These events resulted in, based on their intensity, internally displaced persons, loss of human lives, loss of crops and damage to road infrastructure[10].

In 2021, **65% of hydrometeorological events caused by atmospheric phenomena were due to heavy rainfall**, which is distributed across the country depending on each area's wet season[11]. These events are increasingly more frequent and have a greater impact. For example[12]:

- the duration of the 2014-2016 drought was 2.4 times longer than the 2009 drought, and 1.8 times longer than the 1997 drought, which was considered to have significant impact on the country in terms of productivity.
- Hurricane Otto caused approximately USD 205.7 million in damage and losses in 2016, and directly impacted 10,831 people in 461 communities.
- Tropical Storm Nate, which affected the country for only three days in 2017, caused losses and damage amounting to approximately USD 633.5 million (equivalent to 1% of the GDP for this year). In addition, it had significant social impacts, such as 14 fatalities and displacement of 11,517 people who had to seek refuge.

Additionally, geophysical hazards, particularly earthquakes, also represent a significant danger to the country, as the subduction of the Cocos plate beneath the Caribbean plate generates frequent seismic activity.

Volcanic risk in Costa Rica is also considerable. The National Emergency Commission (CNE) identified 16 known peaks of volcanic origin and 9 active volcanoes. The country's location within the Pacific 'Ring of Fire' further amplifies its exposure to volcanic eruptions. Landslides could represent an additional risk and might be caused by heavy rainfall, earthquakes or volcanic activity.

A comprehensive analysis of potential climate impacts on the Costa Rican economy does not exist. This report presents the available information provided by Global Shield stakeholders and strategic partners.

2.2 Socio-economic characteristics

Costa Rica is an upper-middle-income country with a GDP per capita of USD 13,120.6 and constant economic growth over the last 25 years. Nevertheless, given global uncertainty and economic slowdown experienced by major trading partners, a deceleration in growth is

[ii] Not all of these events were registered as disasters or are directly related to a national declaration of emergency.

projected, standing at 4.3% in 2024[13]. **The services sector, agriculture and industry have been identified as the key sectors of economic activity** (see Table 1).

Table 1 Percentage of GDP by economic activity in 2021.

Economic Activities	Share of value (%)
Agriculture, forestry and fishing	4.8
Industry and construction	22.4
Services	72.8

Source: OECD, 2023[14]

In 2023, Costa Rica had a total population of 5,512,173 inhabitants, with a Human Capital Index (HCI)[iii] of 0.63 (scale 0-1)[15]. Life expectancy at birth is 77 years and the Gini Index is 46.7. 50.3% are men, whilst 49.7% are women[16], 83% of the total population live in urban areas.

The current demographic trend continues to age, with 10.1% of the population being over 65 years old. This represents an increase of approximately 5% compared to the data from 2000, mainly due to the low birth rate, high life expectancy and stable mortality rate. On the other hand, the population under 15 years of age represented 20.8% of the population in 2022, compared to 31.9% in 2000[17].

The unemployment rate stands at 8.5% in May 2024. However, according to the State of the Nation 2022 report, since the end of the COVID-19 pandemic, the economy has been producing more, but with fewer jobs. During the second quarter of 2023, the country produced 11% more compared to 2022, but with 3% fewer people employed[18]. **This trend is not widespread across all sectors of activity, with agriculture, construction, hotels and restaurants being the sectors that are lagging the furthest behind in generating added value and employment opportunities compared to pre-pandemic conditions.**

From 2019, prior to the COVID-19 Pandemic, to the second quarter of 2023, fewer people are employed (-3.4%), informal jobs have been destroyed (-12.5%) and there is a growth in the population not seeking paid work (21%). This is due, amongst other reasons, to the difficulties in finding a qualified position and gender gaps, which prevent many women from working outside their homes as they take on domestic responsibilities[19].

Costa Rica is the country with the highest proportion of migrants in Latin America and the Caribbean (10%), mainly coming from the neighbouring country of Nicaragua. In general, migrant works are concentrated in sectors and occupations that nationals consider less

[iii] The HCI calculates the contributions of health and education to worker productivity. The final index score ranges from 0 and 1 and measures the productivity as a future worker of a child born today relative to the benchmark of full health and complete education.

attractive, which is a reflection of their low salaries and poorer working conditions, or because nationals are increasingly overqualified for such roles[20].

With regard to poverty indicators, the results of the 2023 National Household Survey **show that 21.8% of households in the country were living under conditions of poverty** (insufficient income in 390,506 households), **with 6.3% of households under extreme poverty**. By area of residence, 26.4% of households in rural areas are living in poverty, whilst urban areas registered 20.1%[21].

According to the World Bank, although poverty rates are higher in rural areas, anti-poverty efforts require a clear focus on cities and urban areas as well. **72.5% of Costa Rica's population lives in urban areas, therefore poverty is predominantly an urban issue in absolute terms**. Out of a total of 1.35 million poor people, 930,000 (almost 70%) live in urban areas[22].

In Costa Rica, several subgroups of the population are more likely to live in monetary poverty. These are women of childbearing and care-giving age, children, Nicaraguan migrants, people with an education below secondary level and individuals living in a household with an unemployed head. The situation of these groups has not improved significantly in the decade before the COVID-19 pandemic, and poverty rates in each of these groups increased during the pandemic. Poverty rates used to be higher in rural areas, but these have been converging with those in urban areas[23].

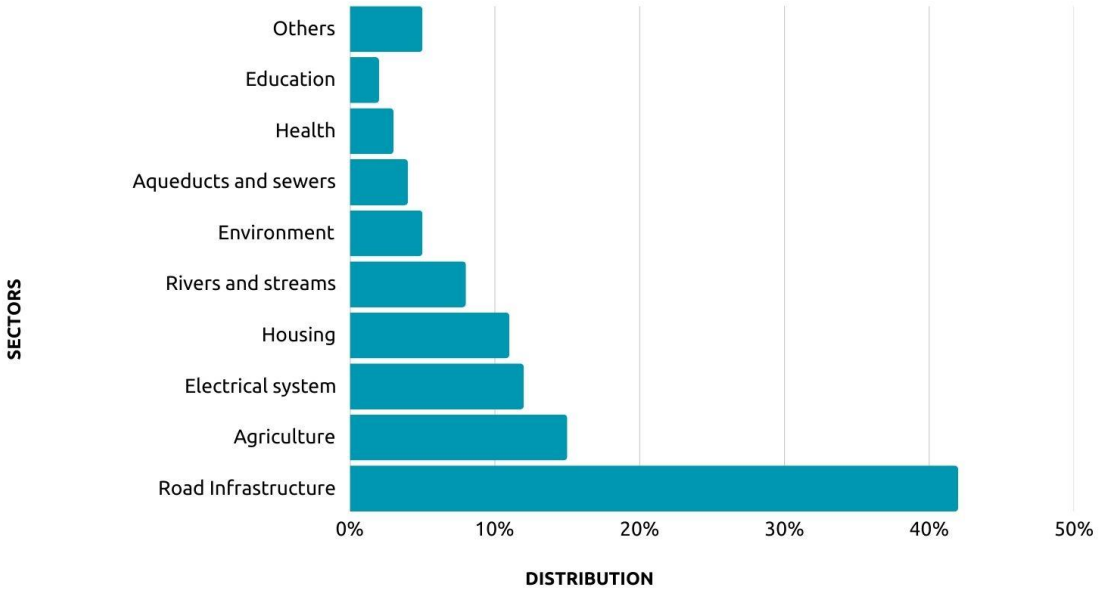
3. Risk Assessment

According to the 2024 Global Risks Report by the World Economic Forum (WEF), the main risks identified for Costa Rica are economic downturn, public debt, erosion of social cohesion, unemployment and extreme weather events[24].

This section focuses on the analysis of risks related to climate change and disasters. According to the Compendium *Costa Rica Impacto de los Fenómenos Naturales para el periodo 1988-2018*[25] [Costa Rica: Impact of Natural Phenomena for the Period 1988-2018], the economic value of the damages during this period was USD 3.35 billion for hydrometeorological events and USD 1.241 billion for earthquakes. However, it is important to note that these figures might be much higher, as they only consider direct damages in the context of a declared emergency. **Indirect impacts or cases in which a national state of emergency was not declared would not be taken into consideration.**

Figure 1 shows the distribution of losses related to hydrometeorological phenomena and earthquakes, by affected sector, for the period between 1988-2008.

Figure 1 Distribution of losses by sector for hydrometeorological phenomena and earthquakes 1988-2018 in Costa Rica



Source: Compendio Costa Rica. Impacto de los Fenómenos Naturales para el periodo 1988-2008.

Regarding the value of damages by affected sector according to the type of event, this compendium shows that **82.9% of losses due to hydrometeorological phenomena are concentrated in the following sectors: road infrastructure (54.3%), agricultural (17.6%) and the banks, beds and protective infrastructure of rivers and streams**[26]. With regard to **losses due to earthquakes, 87.6% are concentrated in infrastructure (river systems, streams and housing), in the agricultural sector, the power grid and road infrastructure.** The study highlights that both sector concerning rivers and streams and the agricultural sector are sensitive to the occurrence of losses caused by both natural events: hydrometeorological phenomena and earthquakes.

The country is still working on tracking and monitoring damages as well as economic and non-economic losses related to climate and disaster risks.

3.1 Overview of the main hazards and impacts in Costa Rica

The World Risk Report[27] classifies Costa Rica's risk generally as 'high', with 'very high' exposure and 'low' vulnerability.

A review of historical data on disasters, available from 1910-2024 in the EM-DAT catalogue, shows **77 recorded disasters**. In order to be able to make a comparison, only events from 1968 onwards were considered, excluding epidemics.

43% of these events were floods, 19% earthquakes, 16% storms, 9% volcanic activity and 7% droughts. Floods caused 36% of total economic damages and 31% of deaths; storms contributed to 37% of economic damages and caused 24% of deaths, whilst earthquakes represented 24% of economic damages and 19% of deaths. It is mentioned in the National

Adaptation Policy (*Política Nacional de Adaptación al Cambio Climático*, PNACC) that in the country it is estimated that, between 2005 and 2017, recorded losses amounted to USD 2.21 billion[28]. Table 2 shows data by disaster type.

Table 2 EM-DAT 1968-2024: natural events, excluding epidemics

Disaster type	Subtype	Event count	Total deaths	Total affected persons	Total damage in millions (USD)[iv]
Drought	Drought	5			45
Earthquake	Earthquake	13	127	164,493	633
Flood	Riverine	21	97	571,659	704
Flood	Undefined	9	54	396,264	270
Landslide	Landslide	1	7	200	
Storm	Tropical Cyclone	10	114	1,094,836	987
Storm	Undefined	1	3	216,000	
Volcanic	Ashfall	6	89	104,571	44
Wildfire	Forest fire	2		1,200	

Source: GRMA Report (see Annex 3)

The information above is a useful guide, but it should be noted that the historical disaster catalogues tend to be incomplete due to short registration periods and incomplete or inconsistent recording of the impacts of these climate-related events. This can influence the number of events and their total impact. Global risk indices are limited in their use to understand risk at a granular level, and there is no subnational risk index available for Costa Rica in INFORM.

With regard to climate change, Costa Rica will face significant challenges in the coming decades, with projections that indicate substantial changes in temperature in all regions, decrease in precipitation and an increase in the frequency of extreme weather events in different areas[29]. For 2050, a 25cm increase in sea level is expected which threatens coastal regions.

The areas in the country that are most vulnerable to climate change are identified using a subnational climate vulnerability index. The study reveals that both rural and urban areas are affected[30]. **Rural, agricultural cantons such as Los Chiles, Matina, Talamanca and Buenos Aires are highly exposed** due to the hazard component, whilst certain urban cantons

[iv] Economically adjusted

such as Tibás and San José still show high levels of risk driven by population density, economic inequality and/or the pressure on public services.

For 2050, the average temperatures in Costa Rica are projected to increase between 1.25°C and 1.75°C compared to the period from 1950 to 2014, with possible increases of 1.5°C to 4°C by the end of the century (WB, 2021). The National Institute of Meteorology predicts that, by 2070, temperatures will increase between 3°C and 6°C compared to the averages from 1961 to 1990.

With regard to changes in precipitation, variability of rainfall patterns is expected to increase. **The majority of regions**, particularly in the Pacific Northwest, the Central Valley and the Caribbean region, **may experience up to 25% less precipitation in the coming decades[31]. On the other hand, some parts of the Central Pacific may experience an increase in annual precipitation.** These changes will probably bring about more frequent and intense droughts, interspersed with periods of intense precipitation.

The following have been identified in the most affected regions:

- Guanacaste: This north-eastern province is expected to experience the greatest changes in terms of precipitation (reduction) and temperature (increase). The region will become more susceptible to droughts. Agriculture in this area faces additional challenges due to the change in rainfall seasonality.
- Caribbean Coast: This area may experience decreases in precipitation and an increase in temperature, also affecting drought conditions. Furthermore, it is prone to tropical cyclone and flood risks.
- Central Areas: The country's most populated region may see some increases in precipitation along the coast, whereas the Central Valley may experience a reduction in precipitation.
- Montane Forests: Higher altitudes are expected to face changes in temperature and cloud base height which will impact ecosystems that depend on specific climate conditions. The cloud forests in Monteverde, for example, may experience cloud loss, affecting their biodiversity and attractiveness as a tourism destination.

For the risk assessment, the change in precipitation variability will be a crucial variable. **Changes at both extremes, i.e., in dry and humid conditions, will increase the risk of both droughts and floods.** Some regions will be more affected than others, which implies the need for risk assessments that differ from region to region, especially as a source of information for developing adequate climate and disaster risk finance instruments.

3.2 Impact of climate change on key sectors

Climate change is having significant impacts on multiple key, economic sectors in Costa Rica. **Based on the participation of stakeholders in the GRMA programme[v] and the information available in the PNACC (see Info Box 2), the most affected sectors are outlined below.**

Info Box 2: Main sectoral impacts identified in the PNACC

According to the National Policy for Adaptation to Climate Change (PNACC) 2018-2030 and the National Adaptation Plan to Climate Change 2022-2026 (NAP), vulnerability assessments carried out in 2014 in the sectors of water resources, agriculture, biodiversity, infrastructure, food security, resources and coastal areas, have identified **drinking water supply and the condition of the agricultural sector** as areas of particular concern[32]. Based on studies on climate scenarios, exposure and vulnerability conducted at a national and local level, the PNACC analysis identified the following as the main sectoral impacts of the adverse effects of climate change[33]:

1. Biodiversity:
    a. Greater presence of invasive species, pests and diseases
    b. Limitation of genetic resources
    c. Greater number of threatened species
    d. Ecosystem deterioration
2. Health
    a. Higher mortality from cardiovascular diseases
    b. Higher incidence of diarrhoeal diseases
    c. Increase of morbidity and mortality from respiratory diseases
    d. Increase in vector-borne diseases
3. Water resources
    a. Deterioration in water quality
    b. Reduction in water availability
    c. Increase in water demand
    d. Water-related legal-administrative conflicts
4. Infrastructure
    a. Deterioration of infrastructure
    b. Landslides on road surfaces or undermining
    c. Flooding of road infrastructure
    d. Reduced potential of some renewable energy sources
5. Agriculture and fishing
    a. Impacts on food production
    b. Threat to the availability of basic food products
    c. Impact on the country's food security

[v] The Global Risk Modelling Alliance is an initiative by the Vulnerable Twenty (V20) Group and the Insurance Development Forum (IDF). It is sponsored by the InsuResilience Solutions Fund (ISF). The GRMA is a public-private association that facilitates access to information on climate risks and catastrophes for vulnerable countries. In Costa Rica, GRMA implements the support programme: 'Quantitative risk assessment of critical infrastructure with focus on the canton of Heredia for major hazards'.

6. Tourism
    a. Land tenure conflicts
    b. Coastline retreat
    c. Impacts on tourism activity

In the context of this report and due to the potential connection with CDRFI solutions, it's important to delve into the vulnerability of the agricultural/fishing, tourism and critical infrastructure sectors. Additionally, special emphasis is placed on the country's natural capital due to the impacts of natural events and climate change.

Source: National Adaptation Plan to Climate Change, 2022- 2026

Agriculture

Although Costa Rica's economy has diversified in recent decades, agriculture continues to play a key role. A total of 36% of Costa Rica's land use is attributed to agriculture, which represents 14% of the country's employment[34]. **In the National Adaptation Plan (NAP) 2022-2026, the agricultural and fishing sector is identified as one of the most vulnerable to climate change**, given its dependence on natural resources.

Changes in temperature and precipitation will probably alter drought conditions and rainfall patterns. This will impact crop yields and suitable cultivation areas, affecting the production of, for example, bananas, coffee, beans, potatoes, rice and more[35]. Direct agricultural loss estimates, i.e., yield losses, are not included in the quantitative loss estimates in this report. **A gap in publicly accessible information for designing CDRFI solutions has been identified.**

The main meteorological hazards that affect the agricultural and fishing sector include, but are not limited to, hurricanes, tropical storms, cold fronts, the ENSO phenomenon, the La Niña phenomenon, tropical waves, low pressure, drought, landslides, earthquakes[36].

Different factors are identified as determinants of the vulnerability of the agricultural and fishing sector to climate change[37]. These include the following: low levels of schooling; high levels of informal employment in rural and coastal areas, especially amongst women; limited access to financing; lack of a preventative and risk management approach in the sector; traditional agricultural sector of small producers with low productivity; and difficulties in reducing rural poverty.

Critical Public Infrastructure

Decree No. 42465-MOPT-MINAE-MIVAH defines critical public infrastructure as the set of essential buildings, networks and transportation systems for preserving and maintaining the country's national sovereignty, socio-economic functioning and health: roads, railways and their respective bridges, airports, ports, border checkpoints, main national security facilities (Law Enforcement, National Coast Guard and Air Vigilance Service), main strategic production, storage and distribution facilities in order to provide essential services such as electricity, telecommunications, water and hydrocarbons, health facilities and food assistance[38].

The country's infrastructure has suffered losses and damages, with **public infrastructure** being particularly affected as it has the highest annual losses due to extreme

hydrometeorological events, accounting for **46% of recorded losses between 2005 and 2016**[39]. According to CNE data, losses increased by 266% from 2016 to 2022, which is mainly attributed to the effects of Hurricane Otto and Tropical Storm Nate. In both cases, losses were concentrated on bridges and roads[40].

Generally, public infrastructure can be damaged by extreme rainfall, landslides and increase in temperatures. This, in turn, will affect other sectors, such as transport or tourism, thus impacting the economy in general. Water, sewage, and bridge systems already require significant repairs due to climate-related events. Furthermore, coastal flooding can damage port infrastructure, which is vital for local and international trade. Tropical cyclones can affect the country's power grid, damaging transmission lines and distribution networks, especially in rural areas[41].

With regard to energy, Costa Rica significantly depends on hydroelectric power, which makes up more than 70% of its production. Rainfall variability, especially during dry periods, affects river flows, which will probably lead to lower water levels, thus affecting energy production. The temperature increase and evaporation may further reduce reservoir levels, which could put additional strain on the system as it results in a decrease in hydroelectric energy production[42].

Another relevant aspect to consider in critical public infrastructure is that the country has six seaports located on both coasts: the Port of Limón and the Port of Moín on the Caribbean coast and Caldera Port, the Ports of Puntarenas, Golfito and Punta Morales on the Pacific coast. The import and export sectors rely on the quality and condition of this port infrastructure[43].

Among the factors that help determine the vulnerability of the country's infrastructure to climate change, the lack of a preventative approach to risk management in infrastructure development is noted.

Tourism

In 2019, tourism accounted for approximately 8.5% of GDP. However, the effects of the pandemic (COVID-19) caused a 70% decline in the sector in 2020[44]. Furthermore, the sector has been impacted by floods and droughts (particularly in the Chorotega Region) and by hurricanes (Otto) and tropical storms (Nate). The region where most of touristic activity takes place, along the north and central Pacific, is projected to experience the most significant changes in temperature and rainfall due to climate change.

Increase in the frequency and intensity of weather events causes direct (e.g., loss of infrastructure and property) **and indirect** (e.g., short-term disruptions to business, impacts on income attributable to environmental losses) **losses to tourism infrastructure, and affects safety as well as potential reduction of destination attractiveness.** Increase in temperature could raise operational costs, and an increase in sea temperature could affect marine biodiversity, thus reducing the range of recreational activities[45].

Some of the impacts that the country experiences in the tourism sector due to disasters and climate risks include coastal erosion and rising sea levels, which pose a threat to tourism infrastructure in coastal areas, such as hotels and restaurants as well as loss of beaches.

Changes in weather patterns impact activities such as ecotourism and adventure tourism, which depend on being able to observe the flora and fauna.

On the other hand, more intense rain and hurricanes cause landslides, destruction of roads and water and sanitation infrastructure, damage to tourist areas, which impacts the accessibility and safety of visitors, and ultimately lead to biodiversity loss. Forest fires, prolonged droughts and deforestation cause degradation of national parks and nature reserves, which are essential for ecotourism[46].

Biodiversity and Ecosystem Services

Natural capital forms the foundation for the country's most important economic activities, such as agriculture, livestock, fishing, water resources and tourism. It ensures the existence, well-being and quality of life of the population, as well as the services that natural capital provides to each of these activities[47].

At a national level, natural capital is vulnerable to the effects of climate change; for example, 66% of the country's coral reefs are at high or very high risk from the effects of climate change, combined with the overexploitation of natural resources and marine pollution. The deterioration of the coral reefs affects the adaptation services that they provide, such as natural barriers that protect coastal communities from flooding[48].

Ecosystem indicators already show possible changes in biodiversity, mainly due to increase in temperature and water shortage. These changes will probably occur at higher altitudes, affecting species distribution and ecosystem services (for example, in cloud forests). Coastal ecosystems are affected by tropical storms and flooding, and impacts are expected to become even more extensive. Marine biodiversity will be strongly affected by the increase in sea temperatures[49].

Initial research shows that the impacts on ecosystems over future time periods have not been modelled and lack of this information means a significant gap in future economic planning. The economic value of ecosystem services should be estimated. Accounting for ecosystem services allows to get a better idea of the scale of the implications that climate change could have on macroeconomic stability in the medium- and long-term.

The Central Bank of Costa Rica is working on developing accounts for three ecosystem services: carbon storage, nature tourism and provision of crops (currently coffee and pineapples). The first accounts were developed with the support of the World Bank through the WAVES (Wealth Accounting and Valuation of Ecosystem Services) initiative[50]. There are other initiatives for assessing the value of the country's ecosystem services. A study conducted by UNDP´s Biodiversity Finance Initiative (BIOFIN) estimates that the total annual value of Costa Rica's capital is USD 14.5 billion (taking into consideration mangroves, forests, coral reefs and the ocean), which accounts for approximately 23% of the country's GDP for 2023[51]. **The same study estimates that the net present value of Costa Rica's natural capital, in its entirety, is USD 845 billion.**

In summary, of the different sectors impacted by climate change and weather-related hazards, infrastructure has been the central topic of many programmes and risk

estimates due to the vital role it plays in the economy. Other sectors, such as agriculture, have received less attention, possibly because recorded losses for droughts are of less magnitude. However, systematic analysis of water shortages, reduction of river flows and subsequent impact on hydroelectrical energy production is lacking. Potential losses from climate-related impacts on biodiversity and ecosystems, either directly or through their effect on the economy in general, have not been quantified.

3.3 Quantitative estimations of the impact of the main hazards

This section offers a brief summary of the different hazards relevant to Costa Rica, and the likelihood of them affecting different areas and provinces of the country. Estimates of losses on physical assets are compared across a total of seven risk profiles, specifying losses due to floods, tropical cyclones and/or earthquakes (see Table 3)[vi].

Table 3 Quantitative Risk Analysis Projects since 2012

Acronym (incl. year)	Name	Floods	Tropical Cyclone	Earthquake
CAPRA 2012	Comprehensive Approach to Probabilistic Risk Assessment			X
GAR 2015	UNDRR Global Assessment of risk	X	X	X
WB 2017	World Bank Climate Disaster Risk Profile		X	X
GEM 2018	Global Earthquake Model Foundation			X
CCRIF 2023	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company	X		X
CDRI 2024	Coalition for Disaster Resilient Infrastructure - Global Infrastructure Risk Index	X	X	X
GRAF 2024	UNDRR and CNE Global Risk Assessment Framework	X		X

Source: GRMA Report (see Annex 3)

Floods

[vi] The summary of the loss estimates has been provided through an upcoming World Bank report on disaster risks in Costa Rica's infrastructure.

According to the ThinkHazard Platform from the Global Facility for Disaster Risk Reduction (GFDRR), risk of flooding in Costa Rica is high[vii]. This applies to river, urban and coastal flooding, including tsunamis. Risk of urban flooding is high throughout the country. Risk of river flooding is high in the north and along the Caribbean coast, medium in the province of San José, low in Puntarenas and very low in Cartago. This generally concurs with the risk assessment by *Aqueduct Water Risk Atlas* from the World Resources Institute.

In agreement with the Water Risk Atlas, the risk of river flooding is very high in the province of Heredia and the north-east of the country, and very high in the south of the province of Puntarenas. According to ThinkHazard, the risk of coastal flooding is high along the Pacific coast and medium on the Caribbean coast. The Water Risk Atlas considers Costa Rica's risk of coastal flooding to be low.

Quantitative Flood Risk Estimates

Some research produced at a global level provides useful context for understanding the risk of flooding in Costa Rica. These include the Global Assessment Report[52], the Caribbean Catastrophe Risk Insurance Facility flood estimate[53], the Global Infrastructure Risk Model and Resilience Index (GIRI) by the Coalition for Disaster Resilient Infrastructure[54] and the Costa Rica GRAF project[55]. Figure 2 shows a summary of the **available direct Average Annual Loss (AAL)[viii] range, which spans from US$16 million to US$193 million.** The four loss estimates from different models include two lower values (GRAF 2024, US$16 million[ix] and GAR 2015, US$40 million) and two higher values (CDRI 2024, US$170 million and CCRIF 2023, US$193 million). The AAL (i.e., capital-adjusted) loss ratio varies between 0.02% and 0.14%, with the order of the estimates remaining the same. The CCRIF estimate is based on an excess rainfall model, instead of a flood model. In the GAR 2015 model, only the biggest rivers were modelled, and flooding outside the plains was not considered, meaning that many places at risk of flooding may not be captured. The flood hazard model used in the GRAF 2024 project is the same as that used in GAR 2015, therefore the same deficiency explained above must be taken into consideration.

Tropical Cyclones

The risk of wind-driven tropical cyclones is medium in the north and the east, and low in other parts of the country, according to *ThinkHazard*.

Quantitative Tropical Cyclone Risk Estimates

[vii] Risk classification, according to ThinkHazard, is based on the likelihood of the risk exceeding predefined thresholds. The thresholds are based on hazard frequency and intensity and are set using expert judgement. A higher classification in ThinkHazard indicates that there is greater potential for damage or disruption to activities or a project in that region, according to the underlying hazard data. www.thinkhazard.org

[viii] Average Annual Loss (AAL) is expected loss per year over a long period, averaged over many years, allowing losses to be modelled (for example, in preparation for a parametric insurance product). AAL is an indication of the amount of savings that a State needs to set aside each year to cover the costs of long-term losses resulting from that hazard.

[ix] These are the expected direct annual losses. If indirect losses (systemic risk) were also estimated, the AAL would be considerably higher.

There are three quantitative estimates of losses on physical assets, coming from GAR 2015, the World Bank Climate Risk Profile 2017 and CDRI GIRI 2024. Loss estimates for tropical cyclones (wind and swells) varied from US$0.04 million to US%0.25 million for buildings alone, and **US$82 million for buildings and infrastructure**. The AAL ratios are based on absolute loss estimates.

Earthquakes

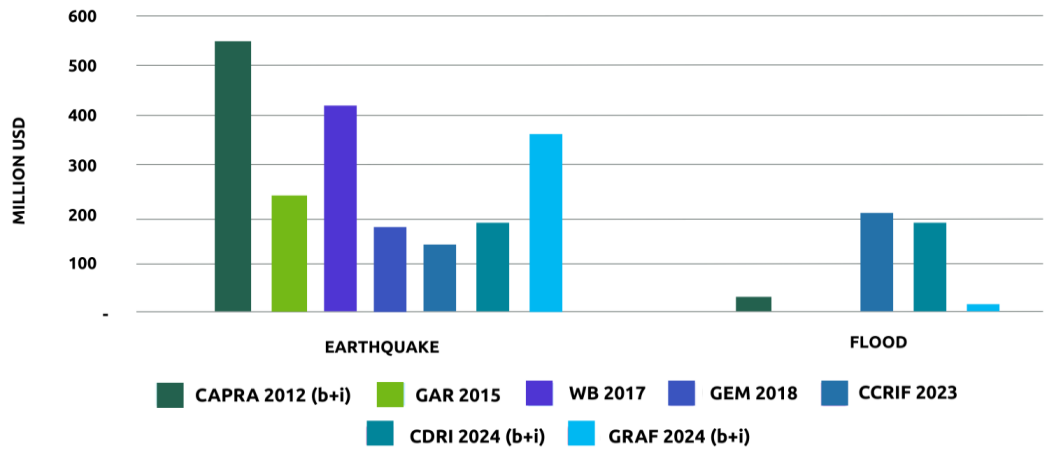
Risk of earthquakes is high throughout the country, according to ThinkHazard. During 2023, a total of 13,494 tremors with magnitudes ranging from 0.0 and 6.8 were recorded by the OVSICORI-UNA seismographic network, both within the national territory and in the border regions with neighbouring countries Nicaragua and Panama[56].

The most recent version of the Probabilistic Seismic Hazard Assessment from 2022[57] contains one of the most up-to-date databases on seismic parameters. The results show an extremely high risk for the peninsulas of Nicoya, Osa and Burica, a very high risk for a large part of the province of Guanacaste, and a high risk for approximately 41% of the country, including the Central Coast and the capital, San José.

Quantitative Earthquake Risk Estimates

There are seven quantitative estimates of earthquake risk available from the last 12 years (Figure 2). As well as the previous risk profiles, there is an estimate from CAPRA 2012 and GEM 2018. **The AAL estimates for earthquakes range from US$90 million to US$407 million for buildings alone, or from US$166 million to US$526 million when infrastructure is included,** or an AAL ratio of 0.09% to 0.62% of total capital.

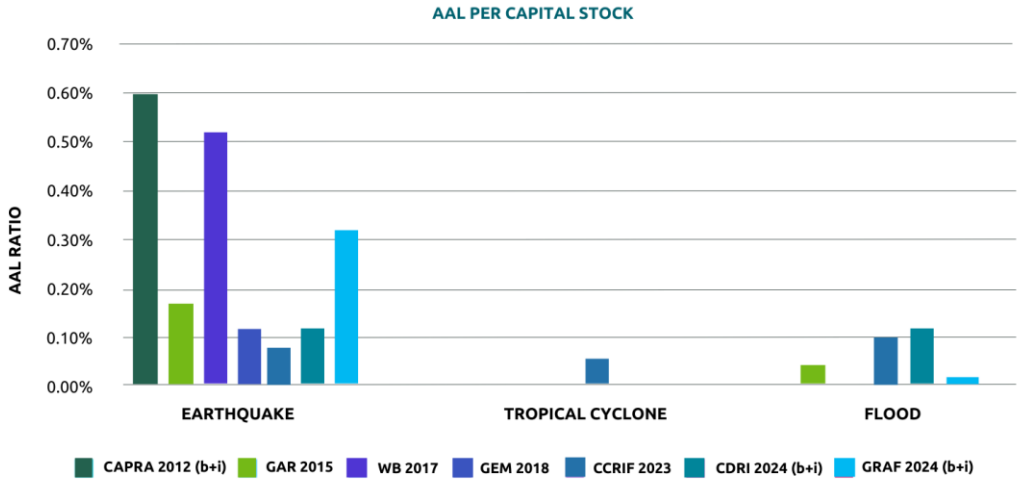
Figure 2: Average Annual Loss (AAL) in millions (USD) for earthquakes and floods across different risk profiles.



Source: National Multi-Systemic Risk Analysis Report (UNDRR, March 2024).

Furthermore, a systematic review of the existing earthquake models and their usefulness for risk assessments or the development of CDRFI solutions under GRMA is planned, with results expected in the second quarter of 2025.

Figure 3 AAL ratio by available capital (AAL normalised by exposure) for earthquakes, tropical cyclones and floods across different risk profiles.



Source: National Multi-Systemic Risk Analysis Report (UNDRR, March 2024).

Drought

There are no Quantitative Drought Risk Estimates

Landslides, Volcanoes and Forest Fires

ThinkHazard provides the following estimates:

- Risk of landslides is high throughout the country.
- Risk of forest fires is high in the west and south of the country, and medium in all other areas of the country.
- Risk of volcanic ashfall is particularly high in the south of Costa Rica, and medium in all other parts of the country.

The Global Infrastructure Risk Model and Resilience Index (GIRI) indicates that 2.76% of the country's total AAL (approximately USD 12 million) would correspond to landslides, affecting roads in particular[58]. GRMA will conduct a systematic review of the existing landslide and volcanic ashfall models, as well as their usefulness for risk assessments or the development of CDRFI solutions, with results expected in the second quarter of 2025.

3.4 Quantification of exposure

Each of the risk model exercises has created exposure databases that provide an estimation of the total value (replacement value) of the physical assets in the country, as well as their distribution at a specific administrative level. These databases are generally based on a top-

down model, using socio-economic data, types of buildings and available capital at a national or subnational level, which are then transposed or disaggregated in greater detail, using data such as geographic distribution of the population or GDP as an approximation.

Other efforts intend to combine top-down global approaches with bottom-up regional or local approaches (where available), for example, GEM. Differences should be considered when comparing loss estimates or using loss metrics for the development of CDRFI solutions. Using loss ratios, i.e., normalising by the exposure value and calculating losses as a percentage of the total exposed value, can be useful for better comparison.

Table 4 provides a summary of the estimated capital for the different risk profiles and the elements included in the exposure databases. The wide range of estimates can partly be explained by the elements selected as databases in the studies; however substantial differences can be attributed to the specific approach and/or methodology used and, therefore, remain unexplained.

The two most recent estimates (CDRI and GRAF) are quite similar for the building stocktake, at USD 97 billion and USD 101 billion, respectively. The differences stem from the inclusion of fewer infrastructure elements in the GAR, resulting a much lower total for infrastructure exposure (USD 54 billion vs USD 8 billion).

The GRAF methodology provides a better understanding of the consequences that compounded hazards can have on an entire country, estimating not only physical damage to the assets but also to human beings and the cascade effects on the economy and society that damages to physical assets cause.

Table 4 Estimates of total capital stock (not adjusted for inflation) for Costa Rica.

Risk Profile	Year	Exposure value in billions (USD)	Involves	Specific infrastructure elements included
CAPRA	2012	85	Buildings and infrastructure	
GAR	2015	140	Buildings	
WBCDRP	2017	80	Buildings	
GEM	2018	136	Buildings with content	
CCRIF	2023	175	Buildings and infrastructure (repeated)	Airports, power plants, water, energy, roads
CDRI	2024	151 (97+54)	Buildings (97- excluding commercial and industrial) and key infrastructure (54)	Land transport (roads, railways, bridges, tunnels), telecommunication lines, energy, water utilities, ports and airports, oil and gas facilities
GRAF	2024	109 (101+8)	Buildings (101) and infrastructure (8).	Water utility pipelines, treatment plants, energy transmission lines, power generation plants, roads

Source: GRMA Report (see Annex 3)

Table 4 provides an isolated view of the exposure estimates used in the risk profiles above to understand the origin of the differences in the loss estimates. Exposure estimates vary substantially across existing risk profiles. Wide variation persists between different estimates when normalising by exposure.

Therefore, the variations between the loss estimates are not a result of the differences in exposure value estimates, but rather of a different perspective on risk. Analyses with higher loss estimates also generate the highest loss ratios.

From the three most recent profiles (CCRIF, CDRI and GRAF), it can be observed that the relative differences are reduced probably due to the inclusion of different infrastructure elements in the estimates, rather than differences in other risk components such as hazard.

3.5 Impact on vulnerable groups

This section was written taking into account the results of the study 'Gender Analysis of Climate and Disaster Risk Finance and Insurance in Costa Rica', produced by Oxford Policy Management and commissioned by the Centre of Excellence on Gender-smart Solutions.

The country's recognition of the differentiated vulnerabilities to climate and disaster risk within its policy framework is fundamental. Vulnerability to climate and disaster risk varies according to socio-economic, geographical, demographic, cultural, political and environmental factors. Different groups face varying levels of vulnerability to climate change due to factors such as gender, age, social status, health, wealth, disability and other sociocultural characteristics. International agreements such as the 2030 Agenda[59], the United Nations Framework Convention on Climate Change (UNFCCC)[60] and the Paris Agreement recognise that climate risks often affect women, men and other vulnerable groups in different ways[61]. The State of the Nation 2023 Report notes that, in Costa Rica, inequality in the right to live in a safe and sustainable environment stems from the population's varying levels of exposure to environmental risks based on where they live. Using a cantonal index on conditions for sustainable real estate development (integrating aspects such as disaster exposure, public service provision capacity, land use regulation, etc.), it is estimated that the five cantons most vulnerable to inequality are Turrialba, Turrubares, Jiménez, La Cruz and Talamanca[62].

In terms of the characteristics of vulnerable populations in Costa Rica, different groups 'historically excluded and most vulnerable to climate risks' have been identified, including indigenous peoples, the Afro-descendant community, organised women's groups, youths, the LGBTQ community, people with disabilities and the elderly. These groups face significant challenges in accessing financial services, highlighting the importance of ensuring that their needs are actually covered by CDRFI products. Although by 2030 Costa Rica aims to work with differentiated data on the reality of these groups, there is currently little disaggregated data on these groups' access to CDRFI instruments[63]. The NDC (2020) refers to '[...] persons with a disability, transgender people, the elderly, women, youths and children, Indigenous Peoples and Afro-descendant communities' as the most vulnerable groups[64].

The Indigenous Population

Costa Rica is home to 24 indigenous territories, divided amongst 8 peoples, representing 2.4% of the population[65]. Official data indicate that the indigenous communities of Costa Rica lag significantly behind the rest of the population in several areas. For example, 70% of indigenous families have unmet basic needs such as health, education and housing, whereas the national percentage amounts to 24%. The percentage of indigenous teenage mothers is more than double the national total (10.2% compared to 4.3%), as is the percentage of indigenous girls living in free union (12.7% compared to 4.3%). According to the United Nations (UN), only 40% of the indigenous population has access to drinking water, compared to 90% of the population at the national level. Similarly, only 67% of indigenous inhabitants have access to electricity, whereas 99% of the general population have electricity[66]. **Whilst 20% of the country's population lives below the poverty line, this percentage reaches extreme highs amongst the indigenous communities:** Cabécar 94.3%, Ngäbe 87.9%, Bröran 85.0.9%, Bribri 70.89%, Brunka 60.79%, Maleku 44.3%, Chorotega 35.6% and Huetar 34.2%[67].

The OECD (2024) study on gender equality in Costa Rica found that: 'indigenous women experience multiple, interconnected forms of disadvantage due to their gender, indigenous origin and social and economic conditions. In the eight territories where most of the Costa Rican indigenous population lives, the average employment rate of women (17%) is considerably lower than that of men (56%), and is also lower than the employment rate of rural women in general. Only 13% of young indigenous women have a secondary education diploma' (p.9)[68].

One of the main causes behind these statistics is the effect climate change has on these communities: floods are becoming increasingly frequent, hindering the success of crops and leaving community members without food, forcing them to move to towns in urban areas in search of employment[69].

As highlighted by the Intergovernmental Panel on Climate Change (IPCC) in a recent publication (2022), indigenous peoples are more vulnerable to climate change compared to non-indigenous populations. Although indigenous groups play a leading role in the fight against climate change, they are also one of the most vulnerable groups due to their low adaptive capacity and the consequences of climate change, as they usually live in areas where the impact is significantly greater and depend on the natural environment for their livelihood. The economy of indigenous people is based on agriculture, and subsistence farming predominates. Changes in temperature and rainfall directly affect their lives and activities, including: 'production systems, health, the condition of roads and highways' [70]. Furthermore, indigenous populations experience more difficulties due to the lack of land titles and face barriers in accessing legal instruments[71].

People with disabilities

Official statistics show that more than 670,000 Costa Ricans, that is, a total of 17.2% of the adult population (persons aged 18 and over), are living with a disability. According to the information available, 14.5% of adult men are affected by this, whilst 19.9% of women have

a disability[72]. There is no detailed information available on the exposure or vulnerability of people with disabilities in Costa Rica.

Afro-descendants

A census conducted in 2011 found that at least 8% of the population of Costa Rica is of African descent[73]. The concentration of Afro-descendant population is significantly higher in coastal areas. These coastal communities are at high risk of hurricanes, rising sea levels, storm surges and floods. Many of these communities, such as those on the Atlantic coast of Costa Rica, are very vulnerable to the effects of climate change. The majority of afro-descendants live in cities situated less than five metres above sea level, which increases their exposure to climate change. It is likely that meteorological phenomena will worsen their socio-economic conditions and undermine their rights, especially the right to life, food and livelihood, as many depend on local natural resources[74].

Migrants

Costa Rica is located in a region with a high migration dynamic. The Central American region acts as a stepping stone for migrants, most of whom are headed for the United States, although there is evidence of movement or displacement due to environmental reasons. With regard to the migration situation in Costa Rica, and specifically according to data from the Refugee Unit of Costa Rica, at the end of 2022 there were 231,847 asylum seekers/refugee applicants and 14,109 refugees, mainly hailing from Nicaragua, Cuba, Colombia and Venezuela. Furthermore, 350,000 people were in transit in Costa Rica in 2023, which is a 47% increase compared to 2022[75].

Although the main motive for migration and people in transit continues to be economic, climate change (in particular global warming) is expected to negatively contribute towards the need to migrate as a consequence of climate-related events, including both internal migration within Costa Rica and external migration. The landslide in Calle Lajas, Escazú, in 2010, after which the community was relocated, serves as an example of such displacement after climate disasters. This displacement mainly tends to follow the trend of going from rural areas to urban centres, the main displacements being caused by storms, floods or earthquakes[76].

Women producers

An analysis of the data on extreme rural poverty shows that 11.6% of households headed by women live in extreme poverty, compared to the 8.3% of households headed by men who live in this condition. The agricultural and forestry sector in Costa Rica has around 12,598 women producers, of whom 72.8% usually do not receive any kind of payment or remuneration. According to the Agricultural Census 2014, only 15.6% of farm owners in Costa Rica are women[x], whilst the majority of private agricultural holdings (84.4%, or 68,389 holdings) are

[x] The land tenure gap between men and women in indigenous territories is much smaller than in non-indigenous lands: 32.7% of farms owned by indigenous producers and located in the 24 indigenous territories were run by women. These groups operate under a matrilineal system, compensating for gaps in policies and regulations with social institutions.

owned by men.[77] Furthermore, many areas at greater risk of forest fires correspond to areas with more women-owned farms[78].

Available data show how, at both a local and a national level, Costa Rican women face gender inequalities related to land ownership, participation in decision-making, capacity building, access to information and financing, control of economic resources, and childcare responsibilities[79]. Women and children are amongst the most at-risk groups, and there are significant obstacles to accessing the formal finance sector. Agriculture accounts for 36% of land use in Costa Rica, and recent studies have shown the gender disparities in the country's agricultural and forestry sectors.

4. Policy framework and strategies of the country

Costa Rica is at the forefront of climate change response, with a long history of protecting the environment, sustainable development and efforts to mitigate climate change. The country has national and international regulations of varying kinds, ranging from signing international multilateral agreements to internal legislation at different hierarchical levels and public policy instruments (policies, plans and strategies), which are not only aimed at minimising the economic and environmental impact of climate change, but also the social impact.

In recent years, the country has made various commitments to the Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction (2015-2030), the Paris Agreement (PA) and the Nationally Determined Contributions - 2020 (NDCs) under the United Nations Framework Convention on Climate Change. In fulfilment of these undertakings, important national policies, plans of action and strategies have been established. Table 5 illustrates the alignment between international and national instruments over the past decade.

Table 5 Alignment Between International and National Instruments

International legal framework	National legal framework
2030 Agenda for Sustainable Development (Strategic Mandate)	SDGs National Pact National Development Plans
Sendai Action Framework for Disaster Risk Management 2015-2030 (Strategic Mandate)	National Risk Management Policy 2016-2030 National Risk Management Plan 2021-2025 National Disaster Risk Financing Strategy
Framework Convention on Climate Change – COP21 Paris Agreement – 2015 (Legal Mandate)	National Climate Change Strategy 2009-2021 Nationally Determined Contribution 2015-2030 National Policy for Adaptation to Climate Change 2018-2030 National Adaptation Plan to Climate Change 2022-2026 National Plan of Action for Gender Equality in Climate Action 2023-2025 (as part of the NDC 2020 update)
Convention on Biological Diversity – Aichi targets 2020 (Legal Mandate)	National Biodiversity Strategy – 2016-2030 Strategy and Action Plan for the Adaptation of the Costa Rican Biodiversity Sector to Climate Change 2015-2025

Source: National Adaptation Plan to Climate Change, 2022- 2026, updated with recent information.

The country has a regulatory framework in place for managing the effects of climate change. Progress has been made in terms of planning, which has been made possible thanks to the alignment of the National Development and Public Investment Plan (PNDIP), the National Decarbonisation Plan, the Nationally Determined Contributions, the National Policy for Adaptation to Climate Change and the National Adaptation Plan to Climate Change.

Within the context of the In-Country Process, the following policies and strategies stand out. Each policy/strategy and any links they might have with CDRFI are given in more detail in Annex 4.

1. **Nationally Determined Contribution – NDC (2020)**. Under the supervision of the Ministry of Environment´s (MINAE)-Climate Change Directorate (DCC). Costa Rica is committed to strengthen the country's social, economic and environmental resilience to the effects of climate change, through capacity building and development of information for decision-making, inclusion of adaptation criteria in finance and planning instruments, adaptation of public services, production systems and infrastructure, and the implementation of nature-based solutions[80].

   With regard to vulnerable groups, the NDC expresses the commitment to provide, by the year 2030, 'disaggregated data on the realities of groups historically excluded and most vulnerable to the effects of climate change, including, at a minimum, the afro-descendant community, organised women's groups, youths, the transgender community, indigenous peoples, persons with a disability and the elderly'.

   Costa Rica's contributions (updated in 2020 and currently being updated again) span 13 areas identified as priorities for society and the economy. In the context of this study, the focus is on the indirect contribution in the area of infrastructure and construction and the direct contribution in the area of finance.

2. **Costa Rica's National Policy for Adaptation to Climate Change 2018-2030 (PNACC) and the National Adaptation Plan to Climate Change 2020-2026 (NAP).** Under the supervision of the MINAE-DCC. In line with the sectors identified in the Policy's analysis as the most vulnerable to the adverse effects of climate change (presented in Section 3: Risk Assessment), the PNACC is structured around six pillars. Substantive guidelines (knowledge and capacity building, adaptation planning, and investment and financial security) and instrumental guidelines (ecosystem services for adaptation, adapted public services, resilient infrastructure, and resilient and eco-competitive production systems) have been outlined for these pillars[81].

   The PNACC establishes participation and inclusion as its guiding principles, through affirmative action, to ensure gender equality and inclusion of groups particularly vulnerable to climate change. It also focuses on social equity, for fair distribution of prospects and opportunities to access resources, goods and services, to promote, improve and maintain individual and collective health, prioritising the populations most vulnerable to climate change[82].

3. **National Risk Management Policy 2016-2030 (PNGR) and National Risk Management Plan (2021-2025).** Under the supervision of the CNE. The strategic

objective of the PNGR is to develop and implement a long-term economic and financial risk reduction strategy which aims to enable analysis and prospective management of risk within investment into public works and State services.

The PNGR emphasis financial protection as one of the country's main challenges, as it is the most relevant and prioritised issues that the plan takes into consideration. Therefore, it establishes the need to implement a financial management strategy (see the following point) that facilitates appropriate risk identification, estimation of potential losses that might occur and creation of different protection instruments and resource availability[83].

It also highlights the protection of infrastructure and services as well as the need to foster an insurance culture within the public sector.

4. **National Disaster Risk Financing Strategy (ENGFRD):** Under the supervision of the Ministry of Finance and the CNE. It is the strategic framework that reflects the Ministry of Finance's commitment to strengthening management of fiscal risks arising from natural disasters and mitigating the fiscal impact caused by these events.

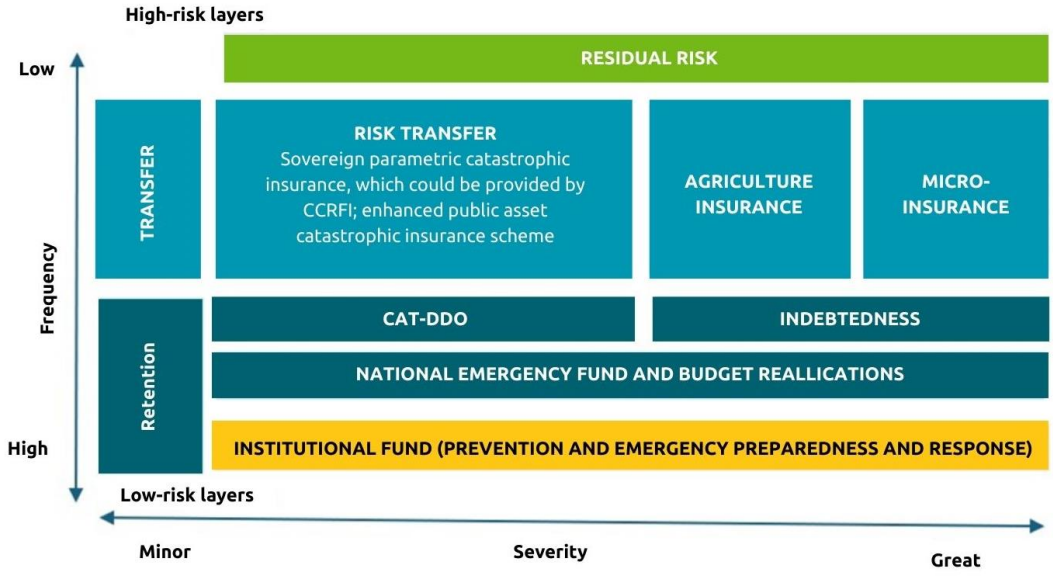
   The strategy is linked to other planning instruments currently in effect in the country:

   - National Development and Public Investment Plan 2019- 2022.
   - National Emergency and Risk Prevention Law and its Regulation (Law No. 8488).
   - National Risk Management Plan (2016-2030).
   - National Climate Change Strategy: National Adaptation Policy to Climate Change (2018- 2030) and the National Decarbonisation Plan.
   - National Bioeconomy Strategy (2020-2030).

   The strategy defines four fundamental guidelines which form the foundation for the current development of an implementation plan that serves as an operational instrument. Guideline 1 (provide quantitative profiles of fiscal risk associated with disasters) and Guideline 2 (have appropriate instruments for addressing fiscal risks associated with disasters) are connected to CDRFI.

   In the ENGFRD, the Ministry of Finance proposes the development of a layered ex-ante strategy for managing disaster risk financing (see Figure 4). The Government has instruments that provide ex-ante availability of resources in the event of major disasters. Nevertheless, these resources should be complimented by financial resources that can be leveraged after an event occurs (ex post). The ex ante CDRFI instruments currently available are outlined in Section 6.1 of this report.

Figure 4 Layered disaster risk financing strategy promoted by the Ministry of Finance, taking into consideration existing instruments and instruments to be evaluated



Source: ENGFRD, Ministry of Finance.

5. **National Plan of Action on Gender Equality in Climate Action** Under the supervision of the INAMU and the MINAE-DCC. The plan's general aim is to contribute towards the coordination of multisectoral actions that promote the reduction of the differentiated impacts of the climate crisis on women in their diversity, especially those in more vulnerable situations, in strategic sectors. It aims to do so through employability and strengthening of economic autonomy, capacity building and innovation, risk management, incorporation of an intersectional perspective on gender in climate action, and production of disaggregated data.

   The plan began as part of the NDC update in 2020 and is the result of joint effort amongst the MINAE-DCC, INAMU and UNDP. Currently, the Plan of Action is in the process of being updated and local-level planning within the INAMU regions, thus the incorporation of the topic of financial protection in the implementation of local plans could be considered.

6. **Other policies, laws and decrees that could relate to CDRFI and the focus on vulnerable groups:**

   a. **Executive Decree 42465-MOPT-MINAE-MIVAH: General Guidelines for the Incorporation of Resilience Measures in Public Infrastructure.** Its goal is that all public works projects consider risk assessment, consistently applying protective measures throughout the life cycle of the country's public works projects.

   b. **Response Protocol to Support Migrants and Refugees in Emergency Situations.** In response to growing demands for addressing migrants, refugees

and persons in transit during emergencies, the Government implemented an emergency response protocol that outlines the objectives, target population, roles, responsibilities and plan for each stage of the emergency. This includes more coordination between the CNE, IMAS and other institutions within the National Risk Management System.

c. **Strategy for Mainstreaming Gender Equality in the National Disaster Risk Management System (2023-2027).** Under the supervision of the CNE. Its goal is to mainstream the gender equality approach across the three sub-systematic areas of the PNGRD: risk reduction, preparedness, response and recovery[84]. The strategy clarifies the approach to ensuring the full and effective participation of women, the protection of their rights and the elimination of gender gaps that give rise to inequality and discrimination in risk reduction, disaster response and recovery. In the livelihood recovery component, specifically in the recovery area, products are identified that could relate to CDRFI (see Annex 4).

5. Enabling environment for financial instruments to address climate and disaster risk focused on insurance

Although Costa Rica already has a relatively advanced disaster risk management and financing policy, insurance still does not play a significant role at a government, corporate or household level. On the demand side, the general level of insurance knowledge, both in public and private sectors, as well as the general population, is low - even more so amongst vulnerable groups. On the supply side, the insurance sector currently has a limited risk appetite for offering innovative and needs-based products, as they are currently focusing on consolidation and growth (see the following section for more detail). In the last three years, the National Insurance Institute (INS) has attempted to implement parametric insurance for the agricultural industry, but it has not been marketed.

For the vulnerable population, access to financial protection instruments continues to be hindered due to the absence of a wide and suitable range of products and due to lack of knowledge on the products and their use, which poses significant limitations (see Section 5.4 for further detail).

5.1 Relevant institutes for the development and implementation of insurance products to address climate and disaster risk

In Costa Rica there are several important bodies for the development and implementation of insurance instruments to address climate and disaster risk. Many of these relate to the policies, plans and strategies mentioned in the previous section and consulted in the gap analysis process. The key stakeholders that foster a conducive environment for CDRFIs, with emphasis on insurance, are listed below:

- SUGESE: an organisation affiliated with the Central Bank of Costa Rica, responsible for authorising, regulating and monitoring natural or legal

persons, involved in acts or contracts related to insurance activities, reinsurance, the range offered to the public, and carrying out insurance business.

- Ministry of Environment and Energy (MINAE): in charge of climate issues and designing public policy instruments, articulating them through its agencies: the Climate Change Directorate (DCC), the National Institute of Meteorology (IMN), the Secretariat of Planning for the Environmental Sector (SEPLASA-MINAE) and the National Centre of Geo-Environmental Information (CENIGA-MINAE).
- National Commission for Risk Prevention and Emergency Response (CNE): the governing body of the National Risk Assessment System, which is made up of Cantonal Committees and Local Committees for Risk Management and the Committee of Technical Advisers of the CNE.
- Ministry of Finance: in charge of governing the tax policy that guarantees the procurement and implementation of public resources, according to the principles of economy, efficiency and effectiveness.
- Insurers: companies that are dedicated to offering financial products that protect people, companies or organisations against specific risks in exchange for a premium.
- The Private Insurers Association of Costa Rica (AAP): a non-profit civil organisation that seeks to develop a more competitive, transparent and inclusive insurance industry comprised of private insurance companies authorised to operate within the country. It represents the provision of private insurance to national and international bodies to promote a market that is both profitable for investors and that offers security and protection to consumers.
- The National Financial System (SFN): the group of institutions and participants that are responsible for generating, collecting, managing and directing savings in the country. The financial system in Costa Rica is regulated by the legislation governing transactions in financial assets, and by the mechanisms that allow the transfer of these between savers and investors.
- The National Insurance Institute (INS): an autonomous insurance institute belonging to the State of Costa Rica, with its own legal personality and assets, authorised to carry out insurance and reinsurance activities. Created under Law No. 12, it is entitled to perform all technical, commercial and financial actions required, in accordance with best business practices, including the possibility of refusing insurance when technically or commercially justified, as well as to set insurance conditions and risk retention margins, according to its technical criteria and administrative policies.
- Development Banking System: established by means of law, it groups entities of different natures, in order to finance and promote productive projects geared towards fostering financial inclusion and the emergence,

growth and scale up of micro, small and medium scale enterprises, thus contributing to social mobility and socio-economic development.

- Joint Social Welfare Institute (IMAS): a government institution tasked with promoting and ensuring that the country's most vulnerable groups have access to social rights. Its mission is to provide and coordinate social protection and promotion services, in an inclusive and supportive manner, for the development of the population living in poverty and extreme poverty, through the implementation and coordination of social and economic programmes and projects.
- National System of Information and Single Registry of State Beneficiaries (SINIRUBE): a public body whose function is to interconnect different State institutions to generate information and management tools that allow public social investment to be used more effectively at the national level, ensuring that resources reach those who need them most and in the way they need them. This system could be a useful tool for delivering potential resources from CDRFI instruments to vulnerable people.

5.2 Evaluation of the legal and regulatory framework for the development of climate and disaster risk finance and insurance (CDRFI) instruments, with emphasis on insurance

Mandate and oversight function[xi]

The General Superintendency of Insurance of Costa Rica (SUGESE) was established in 2008 and is overseen by the National Council for the Supervision of the Financial Sector (CONASSIF). The Insurance Market Regulatory Law, No. 8653, establishes the general principles, goals and standards under which the insurance market should function, as well as the SUGESE mandate, which includes fostering inclusion, reducing protection gaps, sustainable development and technological innovation. Another key aspect of SUGESE´s mandate is to promote a fair, efficient and competitive insurance market that provides consumers with quality products.

Costa Rica is a member country of the OECD and the insurance sector and regulatory framework have been evaluated as part of this Organisation's accession process. SUGESE is also a member of the International Association of Insurance Supervisors (IAIS)[xii] and the Association of Insurance Supervisors of Latin America (ASSAL).

The regulatory context of Costa Rica provides a framework conducive to the supply and innovation of Climate and Disaster Risk Insurance products. The market: i) has a transparent and open licensing scheme, ii) has a flexible approach to the introduction of new products with clear deadlines, iii) supports access to reinsurance and, subject to some conditions, to

[xi] For more detail on the legal and regulatory framework for the development of CDRI, please see Annex 5: A2ii-Sugese CDRI Regulatory Evaluation Report.
[xii] In March 2025, SUGESE and IAIS began a Member Assessment Process to evaluate whether SUGESE complies with the Insurance Core Principles.

insurance abroad, and iv) supports digital processes. Parametric insurance is not regulated in a particular manner, but current legislation does not prevent the provision of such insurance.

In the country there is a specific inclusive insurance framework that enables the use of alternative channels (self-issue insurance intermediaries) for simple products. These channels could be used to facilitate access for vulnerable populations, especially in rural areas, to insurance against climate and disaster risk.

Finally, general restrictions on product prices, design or cost management practices have not been identified.

5.3 Supply review (national insurance sector) with regard to CDRFI[xiii]

Insurance Market in Costa Rica

The most important factor preventing growth of CDRFI, with an emphasis on insurance, in Costa Rica is the lack of supply and demand. Whilst traditional fire insurance, which includes cover against natural phenomena or risks, is a common option (cover is offered by 8 out 12 registered insurers), overall insurance penetration is low (2.6% of GDP).

The insurance sector in Costa Rica has experienced significant transformation since the market opened in 2008, which brought an end to over 80 years of State monopoly. This change enabled private insurers to enter the market, increasing competition and the diversity of products available. Before the opening of the monopoly, the only insurer that operated on the market was the INS. However, despite the opening, the Costa Rican insurance market is still not a mature market, with newly entered insurers focusing on their growth and achieving their financial break-even points.

The Annual Report by SUGESE for the year 2023, reported that the Costa Rican insurance market has 12 active insurers. Total market premiums grew 5.5% in the year 2023 compared to 2022, reaching USD 1.974 billion, with a per capita premium of USD 387. However, the rate of insurance penetration remained stable at around 2.6% of GDP, a figure lower than the 3.1% average penetration in Latin America. Although these figures show an underdeveloped market, they also show potential space for insurance activities to grow[85].

According to studies conducted by The Private Insurers Association of Costa Rica, it is estimated that life and health products represent 68% of expansion opportunities in the Costa Rican insurance market. However, the lack of knowledge and understanding regarding insurance in general continues to be a key obstacle for mass adoption of these products. Insurers agree that many people don't see insurance as a priority, especially compared to other urgent needs, which limits its penetration into the most vulnerable sectors of the population.

[xiii] For more detail on the insurance offerings related to CDRFI, please see Annex 6: Microinsurance Network Report: Summary of Inclusive Insurance and Participation of Insurers in the In-Country Process for Global Shield Against Climate Risks, COSTA RICA

153 insurance policies are registered on the market, which offer catastrophe cover in the areas of fire and allied lines and other property damage. Only two agricultural (crop) insurance policies are registered. **There are no specific data on annual payment of claims after disaster events.** However, SUGESE carried out specific studies on two events that strongly affected the country, Hurricane Otto and Tropical Storm Nate.

Generally speaking, claims reported since the Hurricane Otto disaster, whose eye struck the country between the 23rd and 24th of November 2016, are classified under the general insurance segment, primarily under the branch of fire and allied lines (82.8% of claims), with cover mainly related to flooding, landslides and winds (71.3% of reported claims). **The total amount of claims paid out by insurers was approximately USD 6.13 million, which represent around 3% of total of infrastructure losses** reported by the CNE[xiv].

Claims reported since disaster caused by Tropical Storm Nate, the greatest effects of which were felt in the country between the 4th and 6th of October 2017, are classified under the general insurance segment, primarily under the branch of fire and allied lines (90%), with three main coverages, including flooding, landslides and winds, various damages and additional risks, which total more than 80% of claims reported by different insurers. **The total amount of claims paid out by insurers was approximately USD 34.9 million, which represent around 5.4% of total of infrastructure losses** reported by the CNE[xv].

With regard to collective insurance policies of banking institutions, specifically in the branches of fire and allied lines and other property damage, for the year 2022, a premium income of approximately USD 92.9 million was reported[xvi].

Regulatory challenges from a market perspective

In 2020, the Regulation on Inclusion and Access to Insurance was promulgated, which aims to provide a specific regulatory framework for inclusive and self-issue insurance. The regulation's objective is to allow insurers to develop more accessible and simplified products that can be marked without the direct intervention of intermediaries, thus facilitating their distribution through digital channels or local intermediaries. **Although the country has no specific legislation on microinsurance, self-issue insurance has been used as a way to design insurance that promotes inclusion.**

On the other hand, **although the regulation doesn't talk specifically about parametric insurance, there is a legal criterion regarding the possibility of implementing them in the country**[86].

Nevertheless, although the Regulation on Inclusion and Access to Insurance has been a positive development, insurers have stated that it has failed to provide sufficient incentives for

[xiv] Costa Rica: Report on Claims Related to Hurricane Otto, SUGESE. Information provided directly by SUGESE via email. General information available in: Soley, T. (2019) *Cambio Climático y Sector Seguros*, *SUGESE*. Available at: https://www.sugese.fi.cr/seccion-publicaciones/presentaciones
[xv] Costa Rica: Report on Claims Related to Storm Nate, SUGESE. April 2018. Information provided directly by SUGESE via email. General information available in: Soley, T. (2019) *Cambio Climático y Sector Seguros*, *SUGESE*. Available at: https://www.sugese.fi.cr/seccion-publicaciones/presentaciones
[xvi] Data provided directly by SUGESE is based on information supplied by insurers.

transitioning traditional products to the new regulatory environment of inclusive insurance. In many cases, when the products were adjusted to comply with the new regulation, the transition process took up to a year due to the many compliance requirements that needed to be met. This delay not only impacted market agility, but also increased operational costs for insurers, which reduces the scope for offering inclusive and accessible products to vulnerable populations.

Another key aspect is recognising that inclusive insurance requires special attention to be paid to consumer protection, given that it is aimed at a population lacking experience in financial services and, in particular, in insurance. However, this need for protection must be balanced with the simplicity that is essential for the sustainability of microinsurance products. A specific challenge associated with the Standardised Self-Issue Insurance Summary Document (DERSA) is the administrative burden that is imposed on insurers. Whilst this document aims to standardise key information and make it more understandable to consumers, insurers have reported that this requirement has increased their operational costs, affecting final delivery to the consumer.

Despite the regulatory advances, there are still many areas that could improve flexibility in order to facilitate adoption of simpler and more accessible products. Reductions in documentation requirements for low-risk products, such as self-issue insurance, could significantly increase the market penetration of these products. It would also be useful to implement a more specific system of statistical collection on self-issue insurance to better monitor its impact and subsequently amend regulatory policies.

In this regard, it has been found that many products registered as self-issue insurance still do not fully meet the simplicity and mass accessibility criteria. In focus groups, it was highlighted that many of these products have policies between 30 and 54 pages long that have complex wording which hinders the average consumer's comprehension, especially in areas that are rural and have low literacy levels. This complexity has been flagged as a key obstacle preventing the inclusive products achieving their true purpose of reaching the most vulnerable populations.

Furthermore, there are technological challenges (availability of data and models, actuarial capacities) for the development of parametric insurance, which are particularly relevant for mitigating climate and disaster risks in Costa Rica. Although the INS recorded the country's first parametric insurance in 2022, this product, focused on the coffee-growing sector, is still yet to be implemented due to customers' lack of appetite or interest in purchasing the insurance. In conversations with the sector, it was reported that one of the main challenges is not so much the regulation in itself, but access to suitable technological and actuarial data for developing precise models. Lack of experience in implementing these products has made Costa Rican insurers rely on external assistance to advance in this field.

On the other hand, the operational requirements that complicate taking out self-issue insurance policies and hinder product understanding due to excessive documentation can be particularly counter-productive in the case of parametric insurance, where the inherent complexity adds to the need to understand how the reference index works. Insurers can make innovations in both the sale process and consumer communication, and at the same time

clearly demonstrate to the insurance supervisor how they ensure customer protection. This could enhance the market for products with climate protection.

The need for intersectoral collaboration and the support of countries or entities with more experience in implementing parametric insurance has been identified. Insurers have expressed interest in receiving technical support in order to improve their data collecting abilities, the use of satellite technology and actuarial modelling, which are essential for the success of these products. In this regard, Global Shield could play a crucial role by facilitating these alliances, offering financial and technical support with which Costa Rican insurers can develop and deploy more efficient parametric policies.

A report drawn up by the World Bank[87] reported that building awareness and skills with private insurance companies is a key challenge. Many of these companies have been recently established, and parts of the population still prefer the state insurer. Private insurers are cautious regarding their costs, interests of shareholders and profitability. Furthermore, there is a feeling that this limits innovation in the insurance market.

Tax barriers

Tax barriers represent a key structural challenge for the growth of inclusive insurance in Costa Rica, affecting both the range of products and accessibility for low-income consumers. Currently, life and health insurance products are subject to a reduced Value Added Tax (VAT) rate of 2%, which gives them a slight competitive advantage over other types of insurance. However, other critical inclusive insurance components, such as sales commissions and reinsurance, are taxed with a VAT of 13%. This tax considerably reduces profitability for insurers, in particular for microinsurance products which work with much tighter margins.

Another important tax obstacle is the 4% contribution to the insurance premiums intended to finance the Costa Rican fire department. Whilst this contribution has helped improve the institution's infrastructure, it has also increased insurance costs, affecting products aimed at low-income sectors in particular. Furthermore, 0.5% of premiums must be contributed to finance the National Institute of Statistics and Census (INEC). Insurers have expressed concern at how this tax impacts the economic viability of basic products, such as self-issue life or health insurance, which are essential for protecting the country's most neglected sectors.

Both private insurers and other market players have stressed the need to introduce specific tax exemptions for microinsurance and inclusive products. Without these exemptions, it will be difficult to close the protection gap, given that current costs restrict both the product range and demand from the most vulnerable communities. Furthermore, taxes on premiums and the administrative complexity that comes with their management continue to act as barriers, impeding growth of insurance in rural areas and amongst people with less access to the financial system.

Financial education and insurance initiatives

The lack of financial education is a significant barrier that continues to hinder adoption of insurance in Costa Rica, especially amongst rural and low-income populations. Although both the insurance regulator and companies are making efforts to improve public awareness on the importance of financial protection, many citizens still do not fully

understand the benefits that insurance can offer them. This results in a lack of interest in taking out an insurance policy compared to other more urgent economic needs, such as food and health.

Despite there being some individual projects with limited reach, aimed at specific populations, large-scale significant efforts that include private-public partnership focused on insurance education are still yet to be implemented. This lack of large, structured initiatives impedes the creation of an insurance culture that fosters financial protection amongst the most vulnerable sectors.

In 2019, through Executive Decree N41546-MP-MEIC, **the Government declared training in financial literacy for the population a matter of public and priority interest**, tasking the Ministry of Economy, Industry and Commerce (MEIC) with the institutional coordination of financial education. The MEIC monitors the actions, initiatives and financial literacy programmes of various institutions. However, a coordinated national strategy does not exist.

The insurers consulted individually and the Private Insurers' Association highlight that people often don't consider insurance a relevant tool for their economic well-being. This phenomenon is exacerbated amongst the most vulnerable populations, who often don't see insurance as a necessary investment. Despite this, attempts are being made to collaborate with universities and schools in order to implement educational programmes that raise awareness amongst young people regarding the importance of financial protection - initiatives which could be expanded. However, these efforts have met obstacles, such as disengagement by the educational institutions and limited ability to reach large sections of the populations.

5.4 Barriers faced by vulnerable groups in accessing CDRFI instruments[xvii]

As has been expressed in this section, the development of CDRFI instruments in Costa Rica, especially insurance, faces many barriers, which are further accentuated in the context of vulnerable groups. These groups already face different challenges in accessing the financial system in general. Access to CDRFI instruments is affected by various factors, including access to the financial ecosystem (accounts, savings, insurance, pensions and the stock market), financial barriers (cost of insurance premiums, deductibles and daily expenses), socioeconomic situation (for households in poverty, or near the poverty line, access to private insurance is not viable), and employment status. On that matter, **structural gaps in Costa Rica negatively impact the population, particularly vulnerable groups.**

In the case of women specifically, structural gaps include the ability to have their own income, economic resources and assets, particularly in the agricultural and livestock sectors. According to the Ministry of Agriculture and Livestock (MAG)[88], productive

[xvii] For more detail regarding access to CDRFI instruments amongst vulnerable groups please consult the report: Silva, P. & Maggioni, A. (2024). *Gender Analysis of Climate and Disaster Risk Finance and Insurance in Costa Rica.* Oxford Policy. Access at Costa Rica | The Global Shield against Climate Risks

activities carried out by women in rural areas tend to progress more slowly, as they face much greater difficulties in terms of limited access to credit and production means. They also have less available time due to their domestic and caregiving responsibilities The additional burden of domestic and caregiving work restricts the economic autonomy of these women, who find themselves at a disadvantage in terms of access, management and enjoyment of resources such as time, labour and income[89].

Women producers receive less financial support for their holdings. In general, very few holdings receive financial support[xviii], and women receive much less financing than men. Data from the Development Banking System (SBD)[xix] show that, in 2022, only 32% of all loans were awarded to women, compared to 68% awarded to men. **With regard to the number of loans granted in 2022, men received a total of 9,113 more loans than women: the gap corresponds to 35% of the total.** Gender inequality within the Development Banking System is even more pronounced when considering the amount handed out in loans. Men received 173.068 billion colones more than women, a difference that represents 43% of the total amount. In the agricultural sector, these data indicate an even small percentage as only 20% of loans were granted to women[90].

With regard to indigenous communities, they not only face higher levels of poverty, but also greater levels of financial exclusion. The 2016 Financial Inclusion Survey, conducted by the Central Bank of Costa Rica, indicated that less than 5% of indigenous peoples have insurance plans and credit loans[91]. At the community level, the majority of existing climate finance instruments in Costa Rica focusses on the generation of income and access to loans[xx]. **Access to finance for indigenous communities is lower compared to the average Costa Rican citizen.** Total financial exclusion is particularly widespread amongst indigenous populations of different ethnic origins, and individuals who are barely connected to the financial system mainly hold savings accounts, which have low administrative costs. On the other hand, they have a low level of functionality, which makes the volatility of personal finances extremely challenging for indigenous communities, creating poverty traps.

In Costa Rica, there are no CDRFI instruments developed with a focus on vulnerable groups as such. At the national level, the country has integrated the gender-sensitive approach as a central and cross-sectional theme in action against climate change, particularly in its national climate action plan and in its national REDD+ strategy; however, the plan has not considered creating conditions for the development of CDRFI instruments.

Evidence from other countries shows how specifically gender-sensitive CDRFI instruments often exhibit gender bias and lack social inclusivity. Men and women have

[xviii] It is estimated that only between 4% and 12% of the target population is covered by a microinsurance product. See, for example: Insurance Network (2021) *The Landscape of Microinsurance*. Available at: https://www.ada-microfinance.org/sites/default/files/inline-files/Landscape%20of%20Microinsurance%202021_Report.pdf

[xix] The Development Banking System is a public policy that brings together the efforts of different entities involved in the financing and promotion of productive projects and has important implications for the financial inclusion of women.

[xx] For more detail regarding access to CDRFI instruments amongst vulnerable groups please consult the Silva, P. & Maggioni, A. (2024) *Gender Analysis of Climate and Disaster Risk Finance and Insurance in Costa Rica*. Oxford Policy. Will be available at: Costa Rica | The Global Shield against Climate Risks

different capacities to adapt to climate change due to gender inequality in access to and control over assets, services and decision-making[92]. This creates even more obstacles for women and other marginalised communities to enrol in such programmes and schemes

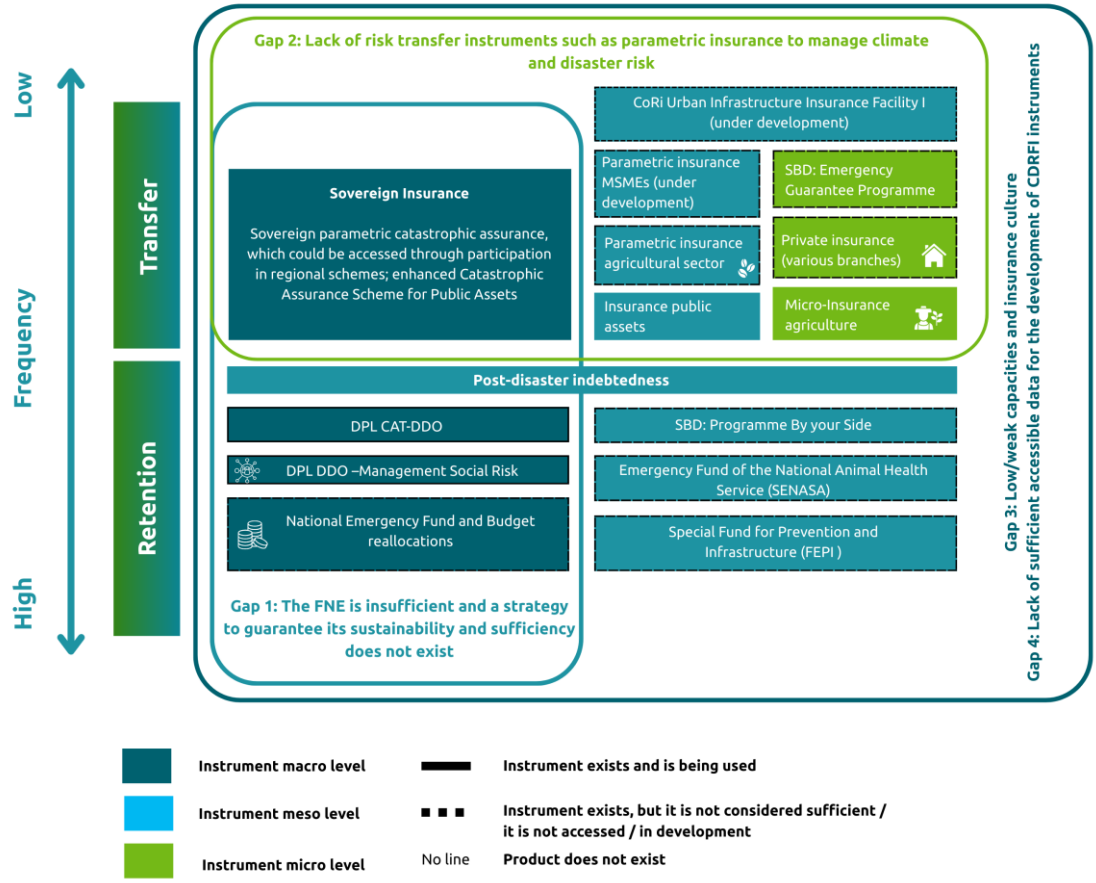
Integrating the gender perspective into CDRFI is important because insurance plans that are not gender sensitive can reinforce power differences between women and men and, consequently, increase vulnerability (as well as potential losses) of those most exposed to and affected by disasters and the adverse effects of climate change. The impact of climate change can negatively affect women's capacity to generate income, reduce the amount of time they have available for productive and domestic activities, and further restrict their mobility. This impact is exacerbated by women's lower levels of decision-making power and asset ownership, which are necessary for developing mechanisms for adequate financial and insurance solutions. This series of factors creates new challenges and opportunities for the empowerment of women[93].

Additionally, the non-customised design of products and the complex eligibility criteria requiring women to own a business and a hold a bank account widen the gender and social inclusion gap. The extent to which insurance helps close the gaps in protecting vulnerable groups against climate risks depends on how the insurance is structured. **Interviews conducted as part of the In-Country Process highlighted the lack of knowledge and capacity within the insurance sector as a critical barrier to designing gender-sensitive insurance instruments.**

6. Existing financial protection solutions

The following is a summary of the products, instruments or projects related to the financial protection and insurances against climate and disaster risk accessible in Costa Rica, as identified in the stocktake (Annex 2). Of the instruments listed, those aimed at Micro, Small and Medium Enterprises (MSMEs), such as the Emergency Guarantee Programme 'SBD by your side' and the Parametric Insurance Project – MSMEs (Public Bank), are currently the only ones addressing those groups vulnerable to climate and disaster risk. Figure 5 (see further down) shows a summary of the protection available at each of the layers proposed in the ENGFRD. It also shows the key gaps and barriers identified and options to complement the available instruments in each of the layers based on the results of this analysis.

Figure 5 Summary of the financial protection available in Costa Rica and the gaps identified in this report



The following sections present the instruments available and under implementation for each of the three layers in more detail.

6.1 Instruments undergoing approval and/or available at the macro level

Budgetary provisions: in accordance with the National Emergency and Risk Prevention Law (Law No. 8488), 'all institutions and public companies of the State and local governments shall include in their budgets a budgetary item intended for developing prevention and pre-paredness actions for emergency situations within areas under their jurisdiction'. This item is used by each institution in accordance with the National Risk Management Plan and with the advice of the CNE.

In line with the foregoing, various institutions, including public enterprises such as the ICE, RECOPE, the CCSS, universities and some cantons, have developed different financial sup-port mechanisms, linked to their budgets, to ensure availability of their own resources in emergency situations.

Post-disaster credits: The government can turn to capital markets, both domestic and international, to finance rehabilitation and reconstruction expenses after a disaster. However, the structuring of these operations takes time, and the financial conditions offered to the country may not be optimal due to the impact of the disaster on macroeconomic indicators and public finances.

The National Emergency Fund: The National Emergency Fund (FNE) is a financial instrument managed by the CNE to support the fulfilment of the country's risk management objectives. The FNE originates from Law No. 4374 of 1969, initially created to manage State resources intended to address, via derogation mechanisms, situations in which a state of emergency has been declared and, in particular, reconstruction works. Currently, following various reforms that culminated in Law 8488, it is assigned the broader purpose of 'addressing and confronting emergency situations and prevention and mitigation'; however, the primary allocation of resources continues to go to rebuilding public and social infrastructure affected by disasters, always through application of the derogation regime.

This fund is financed by the following sources of funding:

- Payments, contributions, donations and transfers from natural or legal persons, whether national or international, governmental or non-governmental.
- Transfer of institutional resources: 3% of profits and accumulated budget surplus of all institutions of the Central Administration, Decentralised Public Administration and public companies (this is one of the Fund's main financial sources).
- Items allocated in the ordinary and extraordinary budgets of the Republic.
- Contributions obtained from financial instruments and interest generated by short-term investment of resources94 (this source of income was recently eliminated through the Law for Efficient Management of State Liquidity, which transferred FNE resources to a Treasury Single Account and removed the CNE's power to make short-term investments, allowing only the Ministry of Finance to obtain returns for own purposes).

Of the sources mentioned, national transfers are the most relevant, that is, resources that form part of the National Budget and the returns from state institutions which, through the Ministry of Finance, via ordinary and extraordinary budgets, are transferred to the Fund. Recently, as the State has lost the ability to allocate resources for disaster response, public debt resources obtained by the Ministry of Finance, whether from national debt or negotiations with international financial organisations, have been added to these sources.

It is important to note that FNE resources finance two areas of action of the CNE:

1. **Within the framework of CNE's regular work, focused on disaster prevention and preparation,** part of the resources cover a significant percentage (approximately 90%) of the institutional budget. Generally, resources used for this come from 3% of the profits and the accumulated budget surplus of all institutions (the Law authorises the CNE to use 3% of the amount that constitutes the FNE for its administration, management, control and auditing). It is worth stating that this expenditure is

complemented by a regular allocation from the National Budget by the Ministry of the Presidency, but it is an amount that does not exceed 10% of the amount required by the CNE to fully carry out its duties.

2. **Within the framework of extraordinary work, that is, in emergency situations, whether under declaration of a state of emergency or without it**, it covers the expenses of all phases of emergency response: first response, rehabilitation and reconstruction. This is the area to which the largest amount of resources is allocated, which, as stated, correspond to Government transfers with the explicit purpose of covering expenses in declared emergencies. Likewise, it pertains to donations and remaining resources that, for some reason, are left unspent.

The Fund is not a typical reserve mechanism, because most of the resources, once they are received, are allocated to general emergency plans to cover investments in reconstruction projects that are being planned.

In the recent past, whilst resources were idle, i.e., awaiting spending, the CNE maintained the practice of making short-term investments. These investments generated returns, which, together with surpluses and donations, allowed the creation of a significant reserve of resources. This reserve was sufficient to provide solvency to both the CNE and the State as a whole, enabling them to address the initial response phase and even advance rehabilitation and reconstruction actions whilst awaiting transfers. However, at the end of 2024, the Law for Efficient Management of State Liquidity came into effect, resources were moved from the Fund to the Treasury Single Account of the State and the CNE lost its power to make investments. This situation caused the reserve content of the Fund to cease to exist.

As stated, FNE resources are mainly concentrated in emergency and disaster action, specifically for the immediate response, rehabilitation and reconstruction phases. This leaves a very small margin for disaster prevention and risk reduction. The Fund, and risk management as a whole, rely almost entirely on transfers made after a state of emergency has been declared, which restricts or annuls any concept of financial sustainability that might be conceived through the FNE. Therefore, disaster response depends on the decisions of the leaders of the institutions involved and the principles of fiscal rules, which currently do not take into account the contingent liabilities represented by disasters. This has historically contributed towards insufficient resources for the full recovery of areas affected by disasters.

According to a direct communication with the CNE, in November 2024 the National Emergency Fund had an approximate amount of USD 179.7 million and a total of disbursements or executed amount of approximately USD 940.2 million[xxi].

Contingent Credit Line (*Development Policy Loan with Catastrophe Deferred Drawdown Option - DPL-CAT DDO*): the second CAT- DDO for the country was approved by the World Bank in March 2023, for an amount of USD 160 million, to strengthen the government's capacity to manage risk arising from natural hazards and those related to pandemics, including the adverse effects of climate change and disease outbreaks. The aim is to ensure that the

[xxi] Direct communication with the CNE of Costa Rica. FNE amount as at 6 November 2024.

country has financial resources freely available in the event of major disasters. This line of credit was approved in a second debate by the Legislative Assembly on 28 November 2024. The disbursement of resources would be conditional upon the CNE declaring a state of emergency.

Public Asset Insurance: The General Law on Internal Control (Law No. 8292) establishes the obligation to identify risks to which public assets are exposed and take measures to mitigate their financial impact, including acquisition of insurance.

However, the lack of an up-to-date and valued stocktake of state infrastructure makes appropriately insuring these works difficult. Furthermore, frequent undervaluation of the insured amount prevents compensation from being sufficient to rebuild or replace the damaged assets.

The Ministry of Finance has engaged with national insurers (such as the INS) and international insurers (such as past conversations with the Caribbean Catastrophe Risk Insurance Facility - CCRIF), to assess the option of purchasing sovereign parametric insurance for earthquakes and rainfall. However, as of the date of preparation of this report, the purchase of sovereign parametric insurance has not been finalised.

Other Specific Funds:

- The Special Fund for Prevention and Infrastructure (FEPI) was created through Executive Decree No.37313-MAG, with the aim of protecting banana plantations, their production and exploitation, as well as the safety of the workers and nearby communities. The fund amounts to USD 3.37 million95.
- Emergency Fund of the National Animal Health Service (SENASA): In 2014, SENASA created a fund intended to protect animals in the case of disasters. This fund aims to guarantee the necessary resources to carry out activities for disaster prevention, response and recovery.
- Linked to adaptive social protection: Contingent Credit Line - DPL DDO Costa Rica, Social Risk Management, for an amount of USD 200 million. This is a project that combines a contingent DPL instrument with support for government policies designed to improve adaptive social protection response. It also supports policies connected to improvements in the social registry to make it more efficient and inclusive, as well as actions linked to improving the impact of social assistance programmes and increasing their efficiency through greater use of digital payments. Although this line of credit was already approved by the World Bank, it still has to be reviewed at a national level by MIDEPLAN and the Central Bank of Costa Rica, before being submitted for approval to the Legislative Assembly (in accordance with an interview conducted with the Ministry of Finance, it is expected to be sent for review and approval by the Legislative Assembly in the first quarter of 2025).

6.2 Instruments available at the micro and meso levels (in place)

Meso Level

Emergency Guarantee Programme for Micro, Small and Medium Enterprises (MSMEs) A 1-to-1 guarantee scheme for beneficiaries of the Development Banking System (SBD) should a natural disaster strike, provided that there is a government declaration of emergency, or a special provision by the Governing Council. It is granted only once, with a maximum guaranteed amount of up to 90%.

SBD By Your Side Programme Targeted at Micro, Small and Medium Enterprises (MSMEs) It consists of a financing line and business support to assist MSMEs that require support for prevention, rescue, recovery and economic reactivation due to risks from market situations, climate-related events, natural disasters in general, or anthropogenic factors.

Micro Level

Insurance Policies in Various Branches such as fire and allied lines, and other property damage. These policies are offered by eight insurers and are intended for property owners, businesses and companies. These are property insurance policies with various coverages for fire, all risk construction and business interruption, including cover for natural phenomena (earthquakes, flooding and wind, amongst others). The probable maximum loss amount of these policies for catastrophic coverage is approximately USD 4.263 billion.

Agricultural insurance policy and parametric coffee insurance. The beneficiaries are agricultural producers. The policies are offered by the National Insurance Institute (INS). Parametric coffee insurance has not yet been commercialized. Agricultural insurance has minimal placement and has practically disappeared.

6.3 Instruments/products under development at the meso level[xxii]

CoRi Urban Infrastructure Insurance Facility (UIIF) I. Municipal governments. A regional project which proposes that selected cities in Latin America undergo a risk assessment of their assets and key areas in order to tailor risk coverage and disaster risk reduction measures. The aim is to transfer disaster risks to a risk pool that leverages economies of scale and shared risks among insurers and reinsurers, thereby reducing the premium costs for cities.

After disaster caused through natural events, cities benefit from quick access to financial resources to rebuild critical infrastructure and help the most vulnerable residents cope with the impacts[96].

Parametric Insurance – MSMEs (Private Bank). MSMEs. Parametric insurance for MSMEs across all industries to cover business interruption. The project is already in its final stage and is in contact with a private insurer in order to place the product. It is expected to be ready this year.

[xxii] At time of writing this report, no options under development at the micro level were identified.

Parametric Insurance – MSMEs (Public Bank). MSMEs – Coffee-growing sector. Parametric insurance for business interruption for the MSME portfolio.

Parametric Insurance – MSMEs (Public Bank). Developing parametric insurance for the agricultural sector, specifically coffee growing, with a smart agricultural component to improve environmental practices.

7. Gap Analysis

This section presents the main findings, in terms of gaps and needs identified for climate and disaster risk finance and insurance. Where applicable, the opportunities mentioned in the participatory process or in the available strategic documents are also presented, which are considered in order to close the identified gaps.

7.1 Gaps and needs in terms of national strategies and policies relevant to CDRFI

Despite the country having recently adopted policies and strategies for managing climate and disaster risk, there are still needs and barriers to overcome for the development and implementation of CDRFI.

Barriers

1) **Lack of linkage and integration** (where applicable) amongst different policies, strategies and frameworks for climate and disaster risk management and its financing.

2) **Poorly articulated implementation plans regarding gender and social inclusion.** In the specific case of gender and social inclusion, national plans acknowledge the importance of financing to address climate and disaster risks. However, policy objectives remain at a high level, and there are opportunities for improvement in providing more detailed regulatory frameworks and implementation plans[97].

3) **Lack of resources and coordination of programmes related to social protection and disaster risk management, with a scope beyond emergency response.** Within the Emergency Operations Centre, the Joint Social Welfare Institute (IMAS) and other institutes belonging to the social sector are represented, and they form an operational committee for social welfare. Additionally, the IMAS, INAMU, CONAPAM and PANI have their own protocols and procedures for emergency response. However, although there are institutional links, these programmes are not properly coordinated through a Protocol.

   Recently, the Ministry of Social Development called for the integration of the Sectoral Committee on Risk Management, whose immediate aim is to draw up a sectoral emergency response protocol to coordinate the different programmes.

4) **Lack of coordinated social programmes to integrate climate and disaster risk management and implementation system:** although the country has relatively broad coverage of social protection programmes, almost all of these programmes are welfare based and are highly fragmented, leaving the vulnerable population uncovered. Additionally, the size of the benefits is relatively low compared to the income of poorest households.

Opportunity

The Costa Rican government is committed to strengthening its capacity to manage and reduce disaster risks and their impacts through pre-established financing, achieving substantial progress in the development of its institutional and legal framework, as well as incorporating climate and disaster risk management into its national development programme.

The approval of the first financial strategy for disaster risk management, and the development of plans across different sectors (for example, transport and agriculture) are examples of the progress achieved to date. The country has also made strides in construction, environmental and climate change adaptation regulations as well as land use planning. Strengthening the links between the strategies and policies would promote medium- and long-term sustainability and provide the potential for aligned implementations of national strategies. For example, in conversations with GIZ Costa Rica and the UNDP Costa Rica, the country is currently updating its NDC 3.0, which presents an opportunity to increase ambition in pre-established financing at a national level.

7.2 Barriers and needs with regard to an enabling environment for CDRFI, focused on insurance products

This section presents the barriers that might be faced or needs that should be covered to develop and implement insurance solutions against climate and disaster risk, regarding the legal and regulatory environment, technical capacities and the insurance market.

Legal and regulatory framework for the development of climate and disaster risk insurance instruments

In general, the legal, regulatory and institutional framework for the insurance sector in Costa Rica is well-developed. However, for the specific development of insurance instruments against climate and disaster risk, some barriers and needs have been identified that must be evaluated in order to determine whether amendments to laws or national and/or institutional regulations are required.

Barriers

- **Regulatory challenges from a market perspective:** Despite the regulatory advances, there are still many areas for improvement of flexibility i.e. to facilitate adoption of simpler and more accessible products. There are many documentation requirements for low-risk products, such as self-issue insurance, which could be affecting market penetration of these products.

- **Tax Barriers:** Tax barriers represent a key structural challenge for the growth of inclusive insurance in Costa Rica, affecting both the range of products and accessibility for low-income consumers. Critical components of inclusive insurance, such as sales commissions and reinsurance, are subject to a 13% VAT, which is added to the 4% contribution on insurance premiums to finance the Fire Department and the 0.5% on premiums to finance the National Institute of Statistics and Census (INEC).

Needs

- The need for a comprehensive review of the regulatory framework within the scope of CDRFI instruments with emphasis on insurance. SUGESE must deepen its understanding of potential regulatory barriers and the readiness of insurers to develop and commercialize CDRFI. Specifically, the following aspects should be evaluated:
    - Assess the regulatory impact (ex-post RIA), especially the regulation of inclusive insurance.
    - Implement a more specific system for collecting statistics, disaggregated by gender and vulnerable groups, on self-issue insurance to better monitor its impact and subsequently amend regulatory policies.
    - Assess whether additional regulations are necessary to facilitate the development and implementation of parametric insurance.

Technical capacities for the development of CDRFI instruments, focused on insurance

Barriers

- Lack of capacity in the public sector, as well as among critical aggregators identified as associations, agricultural producers or sectoral disaster funds to understand pre-established financing and risk transfer instruments. These stakeholders could potentially drive demand with group and meso-level insurance approaches (building on the creation of parity insurance)[xxiii].
- Lack of industry capacity to design and underwrite insurance products to manage climate and disaster risk, addressing the needs and barriers of the most vulnerable groups. The country has a low insurance culture, this is shown in the low insurance penetration rate (2.6% GDP) and in the wide protection gap (see subsection 5.3 for more detail). The general population, especially the most vulnerable groups, do not fully understand the benefits that insurance can offer, compared to other more urgent economic needs, such as food and health.

[xxiii] Parity insurance, or free discussion insurance, are agreements obtained by free discussion between economic agents who negotiate equal conditions – therefore it is a highly personalised document not negotiated on a mass scale.

- Challenges at the supply level. Lack of risk appetite amongst local insurers to offer CDRI products, especially inclusive products targeted at vulnerable groups. This is connected to the market's maturity level (private insurers still in the growth stage) and to other barriers identified in this section (tax barriers, lack of technical capacities, lack of information for CDRFI modelling).
- Technological and actuarial barriers that require greater technical knowledge and precise data, as well as access to suitable models and information so that the market can design parametric products (see subsection 7.3 for more detail).

Needs

- On the demand side. The need to explore how to change demand patterns at the household level.
    - Despite the popularity of **financial literacy campaigns,** experience has shown that they do not always work, especially when the current range of insurance products is inadequate. Even in disaster-prone regions, building an insurance culture is a challenge.
    - It is important to conduct a study on CDRFI needs at a household level and **the challenges of accessing CDRFI** (assuming it is not solely due to awareness and knowledge). Then, compare the information with existing CDRFI products.
- On the supply side: The need to assess capacity of insurers at the national level to design and underwrite insurance products to address climate and disaster risk. Their risk appetite to offer CDRFI products, particularly those designed for vulnerable groups, should also be evaluated.

7.3 Needs with respect to risk analysis and modelling for CDRFI

According to the research conducted by GRMA and information provided by the World Bank on adaptive social protection, various needs in terms of current coverage and/or the quality of risk estimates have been identified for Costa Rica. These can be broken down into four categories:

1. Need to improve the understanding and interpretation of existing risk estimates

- Look into the differences between the results of existing probabilistic models based on risk profiles. This should include an analysis of uncertainties in existing risk estimates. There are very recent estimates by GRAF, CDRI and CCRIF that particularly differ regarding floods.
- Investigate which of the models and modelling approaches used in existing risk estimates are robust enough to be used in CDRFI solutions for Costa Rica.

2. Need to improve existing risk information

- Creation of a national risk data platform. A centralised, open and up-to-date catalogue of metadata to describe the characteristics and origin of available models and data.
- Integration of the number of affected people into risk estimates with disaggregated population data. None of the current quantitative risk estimates include a population exposure layer.
- Preparation of disaggregated estimates of physical asset losses. Population-sensitive risk estimates that have not been the focus of previous analyses. Integration of disaggregated demographic data into the frameworks of existing models would allow previous loss estimates based on gender, rural or urban income, etc., to be refined.
- Loss estimates at the cantonal level. The quantitative risk profiles presented in this report provide estimates at a provincial level. However, these loss estimates may be insufficient for adequate local decision-making in a country as geographically diverse as Costa Rica, not accounting for corresponding spatial variations in risk.
- Expansion and refinement of risk estimates through inclusion of more exposure categories. For example, the GRAF project exposure estimate still does not include telecommunication lines, bridges, ports or airports. Therefore, the important role that ports play in Costa Rica's economy are not sufficiently reflected in the GRAF report. Nor are losses caused by tropical cyclones to telecommunication lines covered. A more comprehensive exposure estimate would lead to more realistic economic loss estimates.
- Addition of more hazard models to existing risk estimates. The GRAF report, for example, only covers earthquakes and river flooding. Aggregating various existing hazard models, particularly for tropical cyclones, would allow indirect losses of these hazards to be estimated within the same framework. Other hazards that should be covered could include heavy rainfall or droughts.
- Improvements in risk analysis to incorporate cascading indirect risks (systemic analysis, in line with the recent contribution of the GRAF).

3. In terms of Adaptive Social Protection, the need to strengthen the National System of Information and Single Registry of State Beneficiaries (SINIRUBE) [xxiv]

- Strengthening SINIRUBE to provide updated information. This system presents issues in updating data, the quality of information and recording of disaster vulnerability (connected to the need mentioned in the previous point). These data would be an important factor to consider for a potential subsidised financing solution that enables vulnerable populations to manage climate and disaster risk (*money-out*[xxv]).

[xxiv] The National System of Information and Single Registry of State Beneficiaries (SINIRUBE) is a platform that integrates and focuses data from selective social programmes in Costa Rica, ensuring broad coverage.
[xxv] *Money-out* is the process to ensure that money is spent on providing what affected communities and individuals need, when they need it most.

Given the identified limitations that these populations face in accessing private insurance, if a solution involving public financing was proposed, there would be no clear and complete information on the number of poor or vulnerable households exposed to these disasters. Therefore, it is difficult to estimate the amount of financing needed to respond to a potential shock.

4. Need to develop new risk estimates for specific hazards and sectors

- Development of a drought model for loss estimation, particularly in the agricultural sector. Although the agricultural sector is included in the GRAF project, greater impacts on the sector can be expected when drought conditions are taken into consideration. Water shortages and rising temperatures could occur in various regions of Costa Rica, increasing the intensity and frequency of droughts in the future. A drought index or model is necessary for developing CDRFI solutions.
- Development of a multi-threat risk assessment for the water, sanitation and health sectors that supports ongoing efforts by Aqueducts and Sewers (AyA) and its GIRA tool (Comprehensive Risk Management Guide for ASADAS). Key infrastructure elements of public water networks, vulnerable to climate-related hazards, could be identified or taken from the GRAF project. Another related element could involve risk mapping regions with anticipated future water shortages.
- Development of risk estimates for the energy sector (predominately hydropower) due to water scarcity. Around 75% of energy production in Costa Rica is based on hydropower. Changes in rainfall quantities and/or precipitation seasonality could affect the water levels of the rivers and, in turn, affect energy production.
- Quantification of ecosystem services through their economic value and/or a biodiversity index for risk estimation. Understanding risk related to ecosystem service options for financial risk reduction was highlighted as an area of interest for a wide range of stakeholders within the GRMA project, but it doesn't appear in the list of selected priorities for projects to be implemented in Costa Rica.
- Research on natural capital risk would align with other active projects such as the Payments for Environmental Services and Conservation Programme or the MINAE Trust Funds, as well as the Forever Costa Rica Association or the FONAFIFO. The value of ecosystems and biodiversity also features prominently in the NAP.
- Having a methodology and the necessary information to quantify the financial protection gap, so that the financial instruments necessary to reduce it can be constructed and provided.

7.4 Financial protection gap

In this chapter, the financial protection gaps identified are presented, using a comparison between the information available on quantitative risk estimates (hazards/sectors) and the protection available (amounts) at the macro, meso and micro levels. Table 6 presents a summary of probable impact caused by the main hazards in Costa Rica as well as the most affected groups and assets. Sections 3.2 and 3.5 of this report provided details on how the hazards affect the different assets and population groups. Table 6 also shows the financial

protection side (risk retention and transfer) available at the sovereign level. Given the data shortage mentioned in this Report, the information provided may not be complete or accurate in relation to reality. Additionally, exact quantification of the financial protection gap is not possible.

Table 6 Financial protection gaps identified in Costa Rica

Climate and disaster risk				**Protection available**		
Hazard and Average Annual Loss	**Actors Affected and Assets Exposed**			**Macro Level**		
Floods: USD 170-193 million Tropical Cyclones: USD 82 million Earthquakes: USD 166-526 million Landslides: USD 12 million	Government and Cantons: Critical public infrastructure: roads, ports, energy and health; and ecosystem services	MSMEs: agricultural, fishing and tourism sector (natural capital)	Rural women producers, specifically in the agricultural and forestry sectors and in informal employment (natural capital)	USD 160 million Costa Rica IBRD CAT DDO 2023 Contingent credit line	USD 179.66 million[xxvi] National Emergency Fund	USD 3.4 million Special Fund for Prevention and Infrastructure for Banana Production
AAL RANGE USD 430 – 813 million *[annual]*				**MACRO-LEVEL PROTECTION AVAILABLE USD 343 million[xxvii]**		

Note: The table provides a summary of the information presented in this report. It focuses on the protection available at the macro level as the quantitative information on available meso- and micro-level financial protection is insufficient.

[xxvi] Direct communication with the CNE of Costa Rica. FNE amount as at 6 November 2024.
[xxvii] The amounts are estimates as at November 2024. The USD 160 million from the CAT DDO has not been disbursed as of the date of this Report.

An analysis of the effectiveness of the financial instruments available, published in June 2024 by GIZ and the Good Financial Governance Programme for green and inclusive economic recovery (BGF), concludes that Costa Rica lacks sufficient financial instrument coverage to address the economic impact that these events would have relative to the GDP of the year of occurrence (see Table 7). The methodology used for this study is based on the biggest economic impact recorded for hydrometeorological events and earthquakes in the country, adjusting the values relative to the GDP of the year in which the event occurred. Additionally, the estimated coverage provided by the financial instruments identified, expressed as a percentage of the 2022 GDP, has been evaluated. This result is considered an indicator or the country's preparedness and response capacity for a future disaster.

Table 7 Greatest economic impact of hydrometeorological events and earthquakes as well as the estimated coverage of financial instruments to address disaster risk in Costa Rica.

Greatest economic impact of hydrometeorological event (% GDP year of occurrence)	**Greatest economic impact of earthquake** (% GDP year of occurrence)	**Estimated coverage according to financial instruments (% of 2022 GDP)**	**Assessment based on maximum recorded losses**
3.5	4.1	0.3	Insufficient

Source: Table adjusted based on diagnostic Stocktake of Financial Instruments for risk management and transfer in COSEFIN countries, with data sourced from the World Bank Group.

7.4.1 Macro-level protection gaps[xxviii]

1. **The FNE is insufficient and lacks a strategy to ensure its sustainability and sufficiency:** As stated previously, the amount of the FNE is approximately USD 179.7 million, with disbursements made as of November 2024 for an amount of USD 940.2 million. The FNE is insufficient and is not sustainable in the medium term, as funds are predominantly concentrated in emergency, recovery and reconstruction actions, leaving a very limited margin for disaster prevention and risk reduction. This generates reliance on transfers that are only made after state of emergency has been declared, which restricts the financial sustainability of the FNE.

   In 2021, the World Bank conducted a study to develop a stochastic methodology for calculating contingent liabilities and assessing the actuarial and financial viability of the FNE[98]. According to the results of the study, the **annual contingent liability for the Government due to natural disasters ranges from 0.42% to 0.48% of the GDP (between USD 363 million and USD 415 million), but could increase to between 2.46% and 3.85% of the GDP (between USD 2.127 billion and USD 3.330 billion)**

[xxviii] Protection gaps are defined as those risks that cannot be mitigated through other risk management measures and for which there is no financial protection.

[xxix], with 1% annual exceedance probability. The Dynamic Financial Analysis, for its part, estimated that the maximum annual probability of ruin for the FNE, over a 30-year horizon, is around 4.5% for Contingent Liabilities simulated using CCRIF SPC models, which rises to 7.4% for the Gamma distribution, and increases to more than 12% under the conservative assumption of the Pareto distribution[99].

More risk estimates are needed for hazards and specific sectors, incorporating expenses related to undeclared emergencies and hiring personnel for emergency response, so as to have a more robust quantification of the fund's insufficiency. With a better quantitative assessment of the fund's sufficiency, a strategy or plan can be developed to redesign it, aiming to ensure its sustainability in the medium and long term.

2. **Lack of risk transfer instruments such as sovereign parametric catastrophic insurance** for public assets, agricultural insurance and microinsurance. Currently, despite past negotiations with the **INS and CCRIF**, as stated in section 6, no insurance purchase has been finalised.

3. **Regarding Adaptive Social Protection** (see Info Box 4), **there is no clear government coordination between disaster risk financing and social protection systems.** Additionally, financing of social protection systems is procyclical, thus decreasing in economic crises. As previously stated, the ENGFRD does not include Adaptive Social Protection objectives, which are a key component in comprehensive disaster risk financing.

Info Box 4: Definition of Adaptive Social Protection

Adaptive social protection (ASP), is a focus area within the larger social protection sector, which has emerged in response to the need to build resilience of the poor and vulnerable to covariant shocks, such as natural disasters, economic crises, pandemics, conflicts and forced displacement[100]. ASP can help to generate resilience amongst the poor and vulnerable by investing in their capacity to prepare for, cope with, and adapt to shocks.

Source: Stress Testing Social Protection, World Bank 2021.

It was reported in Section 6 that the World Bank approved the Contingent Credit Line - DPL DDO Costa Rica, Social Risk Management, for an amount of USD 200 million. This line of credit focuses on two pillars: the first is to promote the targeting of social programmes by strengthening the SINIRUBE, increasing its coverage, robustness and inclusivity. The second pillar is to increase the effectiveness of social spending in order to reduce its fragmentation and promote better mechanisms for delivering social transfers[101]. The complementarity of these resources must be analysed once they

[xxix] Approximate amount relative to Costa Rica's GDP in 2023.

have been approved by the Legislative Assembly, along with potential aid that may be identified within the context of the Global Shield initiative.

Barriers and needs at the macro level

Taking the ENGFRD as a starting point, the following barriers and needs have been identified at the macro level:

Barriers

1. **Challenges for the implementation of the ENGFRD.** In general, the strategy's proposal for a layered financial approach faces challenges in the country for its implementation. The lack of data and models that allow the government to adequately estimate the probable maximum loss due to climate and disaster risk, and the lack of estimates on the likelihood of occurrence for different severity levels, prevents each instrument being accurately placed within the appropriate later and hinders determining the gap to be covered in each layer.

2. **Additionally, the ENGFRD's layered financing approach only considers layers at the macro level and not at the meso and micro level, which could result in lower estimates of sovereign contingent liabilities.** At these two levels, as has been stated in this report, there are significant gaps in demand, which may require coordinated efforts to develop public policies on access to CDRFI solutions.

Needs

1. **Lack of an assessment instrument or methodology within the Ministry of Finance to carry out consistent comparative analyses of the options offered by the insurance market** and select those that best suit the country's needs and the layered financing approach.

   The Ministry of Finance argues that it lacks the tools and internal technical capacities to carry out a cost/benefit assessment of the premium and coverage options or validate the proposed parameters for the policy payout (for example, parameters set using Costa Rican system data in the case of earthquakes). Given the country's fiscal situation and limited availability of resources, they consider the insurance options on offer to date to be 'expensive' and have not adopted them. An internal assessment instrument or methodology is required to carry out comparative analyses of the options on the market and select those that best suit the country's needs and the layered approach.

2. **Need to improve the operation and governance of the FNE.** The current design and operation of the fund faces sustainability challenges, not only related to the sufficiency of financial resources, but also to its governance amidst changes in the country's strategic and legal framework. Currently, the FNE is dealing with challenges arising from changes in legislation that impact its income, operation and sustainability:

- Less income due to the entry into force of Law 9635 'Law for the Strengthening of Public Finances', Law 9524 'Law for the Strengthening of the Budgetary Control of the Decentralised Bodies of the Central Government', the reform of Article 46 Bis of Law 8488 and, more recently, Law 10495 'Law for the Efficient Management of the Public Sector Liquidity'. These changes affect income derived from the 3% surplus/profits contributions that all public institutions are required to pay.
- Law 10495, 'Law for the Efficient Management of Public Sector Liquidity', recently published in June 2024, would affect the functioning and operation of the CNE, specifically the FNE, by mandating that the Fund operate through the Treasury Single Account of the State. This would have implications for interest income and operations due to time constraints imposed by the Ministry of Finance's Treasury Single Account operating scheme.

7.4.2 Meso-level protection gaps

CDRFI instruments are lacking at the meso level for SMEs in the agricultural, fishing and tourism sectors. The Development Banking System has an Emergency Guarantee Programme and a specific line of financing available for prevention, rescue, recovery and economic reactivation in response to climate risks and natural disasters. In terms of insurance, there are policies available in the branches of fire and allied lines, as well as other property damage, with an estimated probable maximum loss amount for catastrophic coverage of USD 4.623 billion. However, this information cannot be disaggregated in order to understand how much of this amount corresponds to SMEs, public institutions, businesses and households.

Furthermore, there is no information available on the impact of disasters at the SME level, making it impossible to quantify the sufficiency of the instruments available.

7.4.3 Micro-level protection gaps

At the micro level, there are currently no accessible risk transfer instruments for vulnerable individuals (women, the elderly, farmers, fishers and micro-enterprises, amongst others). Although there are insurance policies available in various branches (fire and allied lines, other property damage, as stated in Section 6), these policies are targeted at property owners, businesses and companies and are not designed to address the needs of vulnerable individuals.

Despite efforts made to date, women have almost no access to CDRFI solutions to improve their financial resilience. Insurance can be a tool to help individuals manage risk more effectively; however, it is still unavailable to those at risk of poverty and vulnerability in Costa Rica. As Costa Rica continues to deal with the effects of climate change, the adoption of CDRFI instruments offers a promising pathway for strengthening financial resilience and preparedness of climate-vulnerable individuals and households against extreme weather events.

7.5 Prioritisation of sectors and protection gaps

In accordance with the information analysed in this report, the priority focus sectors and protection gaps to be included in the request for support have been established (see table below).

The following criteria were used in the prioritisation process:

- Available information regarding recorded losses caused by hydrometeorological and seismic phenomena (Section 3 Risk assessment).
- Relation and alignment with national policies and strategies on managing the effects of climate change, specifically the ENGFRD, the PNACC and the NAP, which identify these four sectors (public infrastructure, natural capital, agriculture and fishing, and tourism) as vulnerable and present specific actions to address them (Section 4 Policy Framework and Strategies and Annex 4).
- Existence (or lack) of CDRFI instruments, in accordance with information presented in Section 6 financial protection solutions.
- Expert judgement of key stakeholders:
    - Participation of stakeholders in the GRMA programme.
    - Participation of stakeholders in two workshops in Costa Rica as part of the '*Global Shield against Climate Risks'* initiative. The outcomes of the prioritisation of sectors and gaps were validated as part of the Second National ICP Workshop.
    - Interviews and consultations with key actors.
    - Executive Committee Conclusion[xxx].

[xxx] The Executive Committee is made up of executive representatives of the Ministry of Finance, SUGESE and the National Emergency Commission (CNE).

Priority sectors

Priority[xxxi]	Sector	Justification
1	**Critical public infrastructure**[xxxii]	Infrastructure accounts for 46% of recorded losses due to hydrometeorological events between 2016 and 2022. According to data from the *Contraloría General de la República* (CGR), the annual cost of repairing and rebuilding infrastructure affected by floods, storms and droughts alone increased from approximately USD 17.2 million in 1988 to USD 392.5 million in 2010, representing 1.01% of the country's GDP that year. With regard to insurance coverage, whilst there are no data on the annual payout of disaster-related claims, SUGESE conducted a study on the two hydrometeorological events that had the greatest impact on the country (2016 and 2017). Claims paid represented around 3% of infrastructure losses reported by the CNE for the first event, and accounted for 5.4% for the second event.
2	**Natural capital and ecosystem services**	Natural capital forms the foundation of the country's most important economic activities, such as agriculture, livestock farming, fishing, water resources and tourism. It ensures the existence, well-being and quality of life of the population, as well as the services that natural capital provides to each of these activities. Whilst there are no official estimates of the impact of ecosystem services, they have important implications for macroeconomic stability in the medium and long term, particularly through their effects on agriculture and nature-based tourism. There is currently no insurance coverage available for ecosystem services.
3	**Tourism**	In 2019, tourism accounted for approximately 8.5% of GDP. Although there are no disaggregated quantitative data for this sector, it is known to be highly vulnerable to floods and droughts, hurricanes and tropical storms and to changes in temperature and rainfall caused by climate change. Tourism in Costa Rica is closely tied to the impact of climate and disaster risk on infrastructure and natural capital, both of which have also been defined as priority sectors in this study. The increase in frequency and intensity of climate events causes direct losses to public and tourism infrastructure and affects the country's potential appeal as a destination, given that the impact of these events on natural capital affects nature tourism.
4	**Agriculture and fishing**	In the National Adaptation Plan (NAP) 2022-2026, the agricultural and fishing sector is identified as one of the most vulnerable to climate change, given its dependence on natural resources. Agriculture occupies 36% of land use in Costa Rica and represents a very vulnerable population due to low levels of education, highly informal employment in rural and coastal areas (especially amongst women), limited access to financing, lack of a preventative and risk management approach within the sector, as well as difficulties in reducing rural poverty. In terms of coverage, the INS offers an agricultural insurance policy and parametric insurance for coffee, but these have practically no placement.

[xxxi] Regional priorities within the country are not established. Priorities are defined at the national level.
[xxxii] So far, priorities have not been established according to the type of critical public infrastructure.

Priority gaps

Priority	Gap identified	Proposed solution
1	• Insufficiency and lack of a strategy for the sustainability of the National Emergency Fund (FNE).	• Research and development of a plan or strategy to redesign the FNE, with the aim of ensuring its sustainability in the medium and long term.
2	• Lack of an assessment instrument or methodology within the Ministry of Finance to carry out a comparative analyses of the options offered by the insurance market, with the aim of selecting those that best suit the country's needs and the layered financing approach. • Lack of complementary products at the sovereign level for risk transfers in the critical infrastructure and ecosystem service sectors. • Lack of micro-level risk transfer products in the agricultural and fishing sector.	• Comprehensive creation of a development and implementation process for parametric insurance that complements the FNE in order to provide coverage at the macro level for critical infrastructure, natural capital and ecosystem services, and at the micro level for agriculture. • Support with financing insurance premiums for critical public infrastructure and natural capital, as well as agriculture and fishing.
3	• The need to strengthen the risk management culture within public and private institutions, as well as amongst the general population, with a focus on vulnerable groups. • The need to strengthen technical capacities for risk modelling and management within public and private institutions.	• Strengthening of knowledge and building technical capacities in disaster risk management for key actors, both on the supply and demand sides.
4	• The need for an open-access national risk platform that allows national actors to access data and use them to develop strategies and CDRFI products.	• Establishing a centralised, up-to-date and open-access platform for disaggregated disaster risk data by vulnerable group, as well as risk analysis and management modelling.

Based on these priorities, work will begin on the request for support to Global Shield, seeking to align with the targets and deliverables outlined in national action and implementation plans related to climate and disaster risk.

8. Conclusions: Identified Gaps and Needs

This section presents the conclusions of the gap analysis, grouped into the four areas of interest for advancing financial protection against climate and disaster risk (CDRFI).

8.1 National strategies and policies relevant to CDRFI

Costa Rica has a strategic framework for disaster risk financing management, with policy instruments and action plans in place. The NAP 2020-2026, the National Risk Management Plan 2021-2025 and the Disaster Risk Financing Management Strategy establish clear recovery targets, aimed at generating resilience and social inclusion in the face of disaster risk.

However, opportunities for improvement have been identified in the coordination and governance of existing strategies and plans, as well as the need to obtain concrete results, particularly in the most vulnerable sectors. Furthermore, the culture and technical capacities for risk modelling and management must be strengthened within both public and private entities, and availability of robust and accessible information and databases ensured.

8.2 Enabling environment for CDRFI, focusing on insurance

In general, the legal, regulatory and institutional framework for the insurance sector in Costa Rica is well-developed. However, for the development of CDRFI with a focus on insurance, several barriers have been identified that must be taken into consideration. The barriers requiring immediate attention are:

- The capacity of the industry to design and underwrite suitable CDRFI products based on demand.
- The capacity in the public sector, as well as among critical demand aggregators identified as associations, agricultural producers or sectoral disaster funds to understand disaster risk financing and risk transfer instruments.
- The need to assess the impact of legislation related to inclusive insurance and analyse the need for specific regulations for parametric insurance.

From the market perspective, regulatory challenges have been identified. Despite the regulatory advances, there are still areas in which flexibility could be improved in order to facilitate adoption of simpler and more accessible products. In the specific case of parametric insurance, whilst there are no regulatory obstacles for its development and commercialisation, these products have still not been marketed successfully in the country.

On the other hand, **tax barriers** present a key structural challenge for the growth of inclusive insurance in Costa Rica, affecting both the range of products and accessibility for low-income consumers. This extends to the development and implementation of parametric insurance.

On the demand side, within Costa Rica's insurance market there are many challenges to developing and implementing CDRFI instruments, especially regarding financial

education on insurance and risk management. Although multiple efforts have been made to improve financial education and increase public awareness on insurance in Costa Rica, there still remains much to do to close the protection and understanding gap, especially in rural areas and amongst the most vulnerable sectors of the population.

8.3 Risk analysis and modelling for CDRFI

With regard to risk analysis and modelling, understanding and interpretation of existing risk estimates must be improved, as well as existing data and models. For CDRFI, **it is crucial to create a national open-access risk data platform**.

Furthermore, in order to be able to create CDRFI solutions, it is important to develop new risk estimates for specific hazards and sectors, such as droughts and quantification of ecosystem services. Currently, there is neither a methodology nor the information required to quantify the financial protection gap, so that the financial instruments necessary to reduce it can be constructed and provided.

8.4 Key gaps in terms of climate and disaster risk

Costa Rica has high exposure and vulnerability to climate risk and natural disasters. According to the quantitative data available, **the sectors most exposed to climate change and disasters are biodiversity, health, water resources, critical infrastructure, agriculture and fishing, and tourism.** Through Global Shield and SUGESE workshops, **these sectors were highlighted as those with the greatest need to create pre-established financing sources to manage the effects of climate and disaster events.**

In terms of the groups most vulnerable to climate change, individuals who depend on the agricultural industry for their livelihood were identified, specifically women working in agriculture, forestry and livestock farming. Most of these women are employed informally. Although there is no data to quantify the financial protection gap for the most vulnerable groups, available information shows how, at both a local and a national level, women face gender inequalities related to land ownership, participation in decision-making, capacity building, access to information and financing, control of economic resources, and childcare responsibilities.

In summary, the CDRFI instruments to manage climate and disaster risk in Costa Rica are insufficient.

1. **At the macro level, there is a lack of protection for critical public infrastructure (roads, ports, energy and health, amongst others) and ecosystem services.** The ENGFRD outlines a layered financing approach, in which the layers are defined by classifying disasters by their probability of occurrence and severity. However, due to the lack of data and models that allow the government to adequately estimate the probable maximum loss due to climate and disaster risk, and given the lack of estimates on the likelihood of occurrence for different severity levels, each instrument cannot be accurately placed within the appropriate later, nor can the gap to be covered in each layer be determined.

2. **At the meso level, there is a lack of sufficient CDRFI instruments for SMEs in the agricultural, fishing and tourism sectors.** The exact financial protection gap cannot be estimated as there is no information available on the impact of disasters at the SME level. Furthermore, the data available on insurance with catastrophic coverage cannot be disaggregated to determine the amount that corresponds to insurance policies taken out by SMEs.
3. **At the micro level, there are no accessible risk transfer instruments for vulnerable individuals** (women, the elderly, farmers, fishers and micro-enterprises, amongst others). The insurance policies with catastrophic coverage currently available are not designed to meet the needs of vulnerable individuals. **There is no clear coordination between climate and disaster risk financing and social protection systems in the country.** The National Disaster Risk Financing Strategy does not include Adaptive Social Protection objectives, which are a key component in comprehensive disaster risk financing.

Annex

Annex 1: List of stakeholders

Note: An inclusive and participatory process was promoted. However, not all of the stakeholders identified (first column) accepted the invitation to participate in the workshops and bilateral meetings.

Stakeholders identified and invited to participate in the ICP	Type of Entity	Stakeholders who participated in the ICP	
		Participation in Workshops	Bilateral Meetings
Ministry of Finance	Government	X	Lead Ministry and Executive Committee
National Commission for Risk Prevention and Emergency Response (CNE)	Public Sector	X	Executive Committee
General Insurance Superintendency (SUGESE)	Public Sector	X	Focal Point and Executive Committee
Ministry of Environment and Energy (MINAE) / Climate Change Directorate	Government	X	Pending
Ministry of National Planning and Economic Policy (MIDEPLAN)	Government	X	
Ministry of Agriculture and Livestock (MAG)	Government	X	
Ministry of Health (MISAL)	Government	X	
Ministry of Public Education (MEP)	Government		
Ministry of Public Works and Transport (MOPT)	Government		
Ministry of Housing and Human Settlements (MIVAH)	Government	X	
Ministry of Science, Innovation, Technology and Telecommunications (MICITT)	Government		

Ministry of Labour and Social Security (MTSS)	Government	X	
National Meteorological Institute of Costa Rica (IMN)	Public Sector		
Costa Rican Institute of Aqueducts (AYA)	Public Sector		
Costa Rican Institute of Electricity (ICE)	Public Sector	X	X
Public Services Company of Heredia (ESPH)	Public Sector		
National Energy and Light Company (CNFL)	Public Sector		
Costa Rican State Oil Refinery (RE-COPE)	Public Sector		
Board of Administration JAPDEVA	Public Sector	X	
Costa Rican Social Security Fund (CCSS)	Public Sector		
Costa Rican Institute of Fisheries and Aquaculture (INCOPESCA)	Public Sector		
Costa Rican Tourism Board ICT	Public Sector	X	
National Institute for Women (IN-AMU)	Public Sector	X	X
Institute of Rural Development (IN-DER)	Public Sector		
Office of the Ombudsman	Public Sector		
National Commission for Indigenous Affairs	Public Sector		
Joint Social Welfare Institute (IMAS)	Public Sector		
National Institute of Statistics and Census (INEC)	Public Sector		

National Directorate for Community Development (DINADECO)	Public Sector		
National Service of Groundwater, Irrigation and Drainage (SENARA)	Public Sector		
National Institute of Housing and Urbanism (INVU)	Public Sector		
LANAMME, University of Costa Rica	Supervisor	X	
General Superintendency of Financial Institutions (SUGEF)	Supervisor	X	
General Superintendency of Securities (SUGEVAL)	Supervisor	X	
General Superintendency of Pensions (SUPEN)	Supervisor	X	
Central Bank of Costa Rica (BCCR)	Supervisor	X	X
Regulatory Authority of Public Services (ARESEP)	Supervisor	X	
National Association of Engineers and Architects (CFIA)	Supervisor	X	
Superintendency of Telecommunications (SUTEL)	Supervisor	X	
Institute for Municipal Development and Consulting (IFAM)	Local Government	X	X
National Union of Local Governments	Local Government		
Canton of Santa Ana	Local Government		
Canton of Mora	Local Government		
Canton of Curridabat	Local Government	X	
Canton of Desamparados	Local Government		

Canton of Alajuela	Local Government	
Canton of Cartago	Local Government	
Canton of Heredia	Local Government	
Canton of San José	Local Government	
Canton of La Unión de Tres Ríos	Local Government	
Canton of Montes de Oro	Local Government	
Canton of Liberia	Local Government	
Canton of Limón	Local Government	
Canton of Puntarenas	Local Government	
Central American Population Centre (CCP), UCR	Research/Academia	
Master's Programme in Disaster Risk Management and Emergency Response and Emergency Response from the School of Geology, UCR	Research/Academia	X
National University | Institutional Programme for Disaster Risk Management UNA	Research/Academia	
Volcanological and Seismological Observatory, UNA	Research/Academia	
EARTH University	Research/Academia	
Tropical Agricultural Research and Higher Education Centre (CATIE)	Research/Academia	

State of the Nation Programme	Research/Academia	X	
Costa Rican Banking Association (ABC)	Private Finance Sector	X	
Chamber of Banks and Financial Institutions	Private Finance Sector	X	
Private Insurers' Association (AAP)	Private Finance Sector	X	X
National Insurance Institute	Public Finance Sector	X	X
Aseguradora del Istmo (ADISA) S.A.	Private Finance Sector	X	
Aseguradora Sagicor Costa Rica S.A.	Private Finance Sector	X	
Assa Compañía de Seguros S.A.	Private Finance Sector	X	
Best Meridian Insurance Company	Private Finance Sector	X	
Davivienda Seguros (Costa Rica) S.A.	Private Finance Sector	X	
Mapfre | Seguros Costa Rica S.A.	Private Finance Sector	X	X
Oceánica de Seguros S.A.	Private Finance Sector	X	
Pan American Life Insurance de Costa Rica S.A.	Private Finance Sector	X	
Quálitas Compañía de Seguros (Costa Rica) S.A.	Private Finance Sector	X	
Seguros del Magisterio S.A.	Private Finance Sector	X	
Seguros Lafise Costa Rica S.A.	Private Finance Sector	X	

Chamber of Insurance Intermediaries (CIS)	Private Finance Sector	X	
Development Banking System (SBD)	Public Finance Sector	X	
Banco Hipotecario de la Vivienda (BANHVI)	Public Finance Sector		
Business Alliance for Development (AED)	Private Cooperation	X	
Inter-American Development Bank	International Cooperation	X	X
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	International Cooperation	X	X
French Development Agency	International Cooperation	X	X
United Nations Development Programme (UNDP)	International Cooperation	X	X
Caribbean Catastrophe Risk Insurance Facility (CCRIF)	Development Insurer	X	
United Nations Office for Disaster Risk Reduction (UNDRR)	International Cooperation	X	X
United Nations Organisation – Costa Rican Office	International Cooperation	X	
Central American Bank for Economic Integration (CABEI)	International Cooperation		
International Monetary Fund (IMF)	International Cooperation		
World Bank (WB)	International Cooperation	X	X
United Nations Environment Programme Finance Initiative (UNEP-FI)	International Cooperation	X	
Microinsurance Network (MiN)	Private Sector	X	Strategic Partner Gap Analysis Report

Inter-American Institute for Cooperation on Agriculture (IICA)	International Cooperation		
Food and Agriculture Organisation of the United Nations (FAO)	International Cooperation	X	
Access to Inclusive Insurance (A2ii)	International Cooperation	X	Strategic Partner Gap Analysis Report
V20 - Sustainable Insurance Facility	International Cooperation	X	X
Global Risk Modelling Alliance (GRMA)	International Cooperation	X	Strategic Partner Gap Analysis Report
Global Shield Solutions Platform (GSSP)	International Cooperation	X	X
LaRutadelClima	NGO	X	X
National Forestry Financing Fund (FONAFIFO)	Public Sector		X

Annex 2: Stocktake

Project	Instrument	Implemented by (supported/financed by)	Key stakeholders	Timeline and status
Projects financial entities	Meso Insurance: Parametric insurance	V20 SIF – and other cooperation partners (InsuResilience Solucions Fund, UNEP-FI)	Public-Private sector	Timeline: undefined Preparation phase
CoRi Urban Infrastructure Insurance Facility (UIIF) I	Meso Insurance: Sub-Sovereign risk transfer	UIIF (Financiado por el KFW e implementado por medio de ICLEI)	Government	Timeline: undefined Preparation phase
Costa Rica IBRD CAT DDO 2023	Macro level: Contingent credit	World Bank	Government	Timeline: 03/2023 – 03/2026
Proyecto de Recuperación Resiliente frente al Clima y Desarrollo Territorial	Macro level: Credit	World Bank / CNE	CNE	Timeline: 03/2024 - 04/2029
GRMA Costa Rica	Creation of DRF strategy	ISF	Government	Timeline: 06/2023 - 06/2025
Pólizas de seguros varios en ramos: incendio y líneas aliadas, otros daños a bienes y agrícolas y pecuarios	Micro insurance: Property insurance	Instituto Nacional de Seguros	Public Sector	Implementation phase
Pólizas de seguros varios en ramos: incendio y líneas aliadas, otros daños a bienes	Micro insurance: Property insurance	Aseguradora del Istmo (ADISA)	Private sector	Implementation phase
Pólizas de seguros varios en ramos: incendio y líneas aliadas, otros daños a bienes	Micro insurance: Property insurance	Aseguradora Sagicor	Private sector	Implementation phase
Pólizas de seguros varios en ramos: incendio y líneas aliadas, otros daños a bienes	Micro insurance: Property insurance	ASSA Compañía de Seguros	Private sector	Implementation phase

Pólizas de seguros varios en ramos: incendio y líneas aliadas	Micro insurance: Property insurance	Davivienda Seguros	Private sector	Implementation phase
Pólizas de seguros varios en ramos: incendio y líneas aliadas y otros daños a los bienes	Micro insurance: Property insurance	Mapfre Costa Rica	Private sector	Implementation phase
Pólizas de seguros varios en ramos: incendio y líneas aliadas y otros daños a los bienes	Micro insurance: Property insurance	Seguros Lafise	Private sector	Implementation phase
Pólizas de seguros varios en ramos: incendio y líneas aliadas y otros daños a los bienes	Micro insurance: Property insurance	Oceánica De Seguros	Private sector	Implementation phase
Promoting the harmonized incorporation of climate change adaptation and disaster risk management agendas into local development planning	n/a	CNE (UNDP)	Municipalities	Implementation phase
FuTurismo	Meso insurance: TBD	Several partners: Superintendencia General de Seguros (SUGESE), Instituto Costarricense de Turismo, Instituto Nacional de Seguros (INS), BN Sociedad Corredora de Seguros, S.A., SAGICOR Seguros, Pan-American Life Insurance, Aseguradora del Istmo, Seguros Lafise, Popular Seguros Correduría de seguros S.A. (GIZ)	Public-Private sector	Implementation phase
Apoyo al Diseño e Implementación de la Iniciativa de Agropaisajes Sostenibles para la Carbono-neutralidad en el Sector Agropecuario y Forestal de Costa Rica	n/a	BID (Fondo Fiduciario de Múltiples Donantes NDC Acelera(ACL); Fondo Multidonate AgroLAC 2025(MAG))	Government - MINAE	Timeline: 10/2023 - 10/2025 Implementation phase

Programa Aval de Emergencias	Meso level: credit	Sistema de Banca para el Desarrollo	Operadores financieros: entidades acreditadas ante el SBD, reguladas y no reguladas por la Superintendencia de General de Entidades Financieras que tienen programas autorizados por el Consejo Rector	Implementation phase
Programa SBD a su lado	Meso level: credit	Sistema de Banca para el Desarrollo	Operadores financieros: entidades acreditadas ante el SBD, reguladas y no reguladas por la Superintendencia de General de Entidades Financieras que tienen programas autorizados por el Consejo Rector	Implementation phase

Annex 3: Contribution to Costa Rica´s In-Country Process under the Global Shield against Climate Risks – Chapter 3: Risk Assessment

Final version (October 2024) chapter on risk assessment by Global Risk Modelling Alliance (GRMA) for Global Shield-ICP Stocktake and Gap Analysis

This chapter on the risk assessment landscape in Costa Rica has been prepared by the Global Risk Modelling Alliance (GRMA), a partner initiative to the Global Shield Against Climate Risks. At the request of the Ministry of Finance Costa Rica, the GRMA is currently working with the Superintendencia de Seguros Costa Rica (SUGESE) to provide services and capability development in climate and disaster risk analysis. This chapter has benefited from the insights of a Technical Working Group convened by SUGESE, and also concurrent research for a forthcoming World Bank report on risk information of Costa Rica's infrastructure. The purpose of the chapter is to illustrate the extent of existing climate modelling and natural catastrophe risk research in Costa Rica, and to indicate gaps where further risk research would contribute to adaptation policy, resilient investment and disaster risk finance in particular.[xxxiii]

Context: risk analytics – Costa Rica

Costa Rica's climate is highly variable due to its diverse geography, which includes volcanic mountains and its location between the Pacific Ocean and the Caribbean Sea. The country experiences two main rainfall regimes. The Pacific Coast is characterized by a distinct dry season from November to April and a rainy season from May to October, while the Caribbean slope has a more consistently hot and humid climate with year-round rainfall and less pronounced seasonal variations. Further adding to this variability within one year, the El Niño Southern Oscillation (ENSO) phenomenon adds variability between different years. Occurrence of extreme weather events such as storms, floods, and droughts can also be related to ENSO cycles. El Niño years are typically associated with droughts on the Pacific coast, whereas La Niña years often result in heavier rainfall, especially affecting the Caribbean side.

Geophysical hazards, particularly earthquake, also pose a significant threat to Costa Rica, with the subduction of the Cocos plate beneath the Caribbean plate generating frequent seismic activity. Costa Rica's volcanic risk is considerable, with the National Emergency Commission (CNE) identifying 16 peaks of known volcanic origin and 9 active volcanoes. The country's location within the Pacific "Ring of Fire" further amplifies its vulnerability to volcanic eruptions. Landslides can pose an additional risk and can be triggered by intense rainfall, earthquakes, or volcanic activity.

[xxxiii] Disclaimer: This report provides climate and disaster risk modelling context in support of the Global Shield in-country process and is not in itself a new risk analysis. It was prepared by the technical staff of the Global Risk Modelling Alliance (GRMA) in its best effort given very limited time for completion. It is based on documents and information from various reports publicly available on the internet. The Global Risk Modelling Alliance does not guarantee the accuracy, completeness or currency of the data included in this report and does not assume responsibility for any errors, omissions or misinterpretations in this information, or liability with respect to the use of or failure to use the information, methods, processes or conclusions set forth.

Risk indexes such as INFORM (JRC, 2024) and the World Risk Report (Bündnis Entwicklung Hilft / IFHV, 2024) provide a high-level view of risk relative to a country's peers, and some information on the general drivers of risk. INFORM ranks Costa Rica 99th, with 'medium' overall risk – with hazard exposure considered to be 'medium', vulnerability 'medium', and lack of coping capacity to be 'low'. Hazard specific risk is assessed ranging from 0 to 10 (10 being very high risk) with earthquake 9.1, tsunami 8.3, coastal flood 4.1, river flood 2.4, tropical cyclone 1.3, and drought 1.0. The World Risk Report ranks Costa Rica's risk overall 'high' with 'very high' exposure and 'low' vulnerability. A review of historical disaster data, available for the period 1910-2024 in the EM-DAT catalogue (EM-DAT) shows 77 recorded disaster events. For comparison only the events from 1968 onwards and excluding epidemics are considered. 43% were listed as flood, 19% earthquake, 16% storm, 9% volcanic activity, and 7% drought. Floods caused 36% of the total economic damages and 31% of the fatalities, storms contributed to 37% of the economic damages and claimed 24% of the fatalities, and earthquakes caused only 24% of the economic damages and 19% of the fatalities.

Table 1 EM DAT 1968-2024, excluding epidemics

Disaster type	Subtype	Event count	Total deaths	Total affected persons	Total damage in millions (USD)[xxxiv]
Drought	Drought	5			45
Earthquake	Earthquake	13	127	164,493	633
Flood	Riverine	21	97	571,659	704
Flood	Undefined	9	54	396,264	270
Landslide	Landslide	1	7	200	
Storm	Tropical Cyclone	10	114	1,094,836	987
Storm	Undefined	1	3	216,000	
Volcanic	Ashfall	6	89	104,571	44
Wildfire	Forest fire	2		1,200	

The DesInventar database provides historical event data from 1968-2019. In the over 18,000 data entries (including a wide range of events such as drowning and explosions) flood led to about 75% of the recorded losses followed by earthquake with 17%, fire with 4% and landslides with 2%. The number of affected people is recorded as 62% due to flood and rain, 21% due to earthquake and 6% due to landslides. Mortality from natural hazards is highest from

[xxxiv] Economically adjusted

landslide and flood with each about 27%, followed by earthquake, volcanic eruptions and fire with each about 10%. The information is provided on municipality level.

The above information is useful as a guide, but historical disaster catalogues tend to be incomplete due to short recording periods and incomplete or inconsistent recording of event impacts. This can influence the number of events and total impact presented. Global risk indexes are limited in their utility to understand risk at a granular level, and no subnational risk index is available for Costa Rica from INFORM.

Sovereign sources on overall risk

Costa Rica's civil protection agency CNE operates a tracking and monitoring system (CNE 2024). It provides historic losses covering the years 2005-2023. The losses are provided per event on canton level for buildings and infrastructure. Overall, 92% of losses of all recorded events are registered as hydrometeorological and 6% as geological.

The **National Risk Forum**[xxxv] in Costa Rica provides a comprehensive platform for discussing and advancing national risk management policies. It brings together the members of all the coordination bodies of the National Risk Management System to follow up on the national risk management policy on this issue. The Forum also provides a platform for information on advances in risk analyses, data, and overview of recent events.

The **SNIT**[xxxvi] mapping and data portal administered by the National Geographic Institute (IGN) brings together geographic information sourced from different systems and generated by many institutions of the public sector. The SNIT is the official platform through which fundamental geographic information is published in a standardised manner and following the technical standards used in the generation of geospatial information at the national level.

Instituto Meteorológico Nacional (IMN) Vulnerability Assessments

The IMN risk analysis studies[xxxvii] aim to describe climate risks based on vulnerability and hazards, focusing on hydrometeorological weather events such as droughts and heavy rainfall. The analyses are conducted at various geographical scales, including district and cantonal levels, and in several cases even higher resolution. The risk is assessed based on hazard and vulnerability and results are provided semi-quantitatively with five risk levels. The focus is on population including a disaggregation of input data by for example age or mobility restrictions. Although the reports do not cover the entire country, or provide potential losses, the high granularity of the assessments and input data is highly valuable and could be used as a foundation for future quantitative losses estimations with higher resolution or differentiated by population groups.

A recent study by Garro-Queseda et al. (2023) of rainfall-related risks for two specific municipalities, Cartago and Turrialba, based on the IMN risk assessment methodology but adding

[xxxv] https://www.cne.go.cr/rectoria/instancias_coordinacion/foro
[xxxvi] https://www.snitcr.go.cr/Noticias/detallenoticia2?id=bm90aWNpYTo6MTY1MjM3NTM0Nw==
[xxxvii] http://cglobal.imn.ac.cr/index.php/category/publications/analisis-de-riesgo/

an exposure component, highlights differences in risk at a very localised level. While urban areas generally have higher risk due to greater exposure and vulnerability, for rural areas the dominant factors for risk stem from the hazard, e.g. rainfall or storm and limited infrastructure. The study emphasises the importance of considering local context in climate risk assessments.

Although the reports do not cover the entire country, or provide information on potential losses, the high granularity of the assessments and input data is highly valuable and could be used as a foundation for future quantitative estimation of losses with higher resolution, differentiated by population groups (e.g. rural vs urban).

Climate Change

Costa Rica faces significant climate change challenges in the coming decades, with projections indicating substantial shifts in temperature across all regions, precipitation decline and increasing extreme weather event frequency across various regions. By 2050, a sea level rise of 25 cm is expected, further endangering coastal regions. Nawrotzki et al. (2023) focus on identifying areas within Costa Rica that are most vulnerable to climate change, using a subnational climate vulnerability index. The study reveals that both rural and urban areas are affected. Rural agricultural cantons like Los Chiles, Matina, Talamanca, and Buenos Aires are highly exposed due to the hazard component while certain urban cantons like Tibás and San José also show elevated levels of risk, driven by population density, economic inequality, and/or strain on public services. The results align with Quesada-Roman (2022) who created a flood risk index on municipal scale for all 82 cantons/municipalities in Costa Rica (now 2 cantons more). Higher flood risk values mostly occur in flat lands and coastal regions.

Temperature Change

By 2050, average temperatures in Costa Rica are projected to rise by 1.25°C to 1.75°C compared to the 1950-2014 period, with potential increases of 1.5°C to 4°C by the end of the century (WB, 2021). The National Meteorological Institute projects that by 2070, temperatures could increase by 3-6°C compared to 1961-1990 averages.

Precipitation Changes

Rainfall patterns are expected to increase in variability. Most regions particularly in the Northwest Pacific, the Central Valley and Caribbean region may see up to 25% less rainfall in the coming decades (IMN 2021). Conversely, parts of the Central Pacific might experience increased annual rainfall. These shifts are likely to result in more frequent and intense droughts interspersed with periods of heavy precipitation.

Most Affected Regions

- Guanacaste: This northwestern province is expected to see the greatest relative changes for both precipitation (reduction) and temperature (increase). The region will thus become more susceptible to droughts. Agriculture in the region faces additional challenges from changing seasonality of precipitation.
- Caribbean Coast: This area could experience decreases in rainfall and increase in temperature also affecting drought conditions. It's also prone to risks from tropical cyclones and floods.

- Central Areas: The most populated region of the country might see some increases in rainfall along the coast, the central valley could experience reduced precipitation.
- Montane Forests: Higher elevations are expected to face shifts in temperature and cloud base height, impacting ecosystems that rely on specific climatic conditions. The cloud forests in Monteverde, for example, may experience a loss of nebula, affecting their biodiversity and attractiveness as a tourism destination

For the estimation of risk, the change in precipitation variability will be most important. Changes in both extremes, i.e. dry and wet, will thus increase risk of drought and flood. Some regions will be more affected than others implying the necessity for regionally differentiated risk assessments, in particular as information source for the development of suitable climate and disaster risk finance instruments.

Climate change impacts

Climate change is having significant impacts across multiple sectors in Costa Rica. Based on stakeholder engagement within the GRMA programme and on the information available in the above-listed resources, the sectors most affected include:

Agriculture

Agriculture is expected to be one of the most affected sectors from climate change in Costa Rica. Changes in temperature and precipitation are likely to alter drought conditions and rainfall patterns. This will impact crop yields and suitable growing areas and affect production of for example bananas, coffee, beans, potatoes, rice, and others (WB 2021). Estimates of direct agricultural losses, i.e. yield losses, are not included in the quantitative estimations of losses listed below indicating a lack of sufficient publicly accessible information available for the design of CDRFI solutions.

Infrastructure

Both climate-related and geological hazards adversely affect Costa Rica's infrastructure. The Global Risk Assessment Framework (GRAF) project (see also below) has a particular focus on infrastructure as a result of stakeholder prioritisation in Costa Rica. Similarly, infrastructure was identified as a priority sector during the GRMA workshops (GRMA 2024). I.e., road infrastructure can be damaged by extreme precipitation, landslides, and rising temperatures. This is turn will affect other sectors, e.g. transport or tourism and will have an impact on the wider economy. Water systems, sewers, and bridges already require significant repairs due to climate-related events. Coastal flooding can damage port infrastructure which is vital for both local and international trade. Tropical cyclones can affect the country's energy grid, damaging power lines and distribution networks, especially in rural areas (WB 2021, NAP 2022, GIZ IKI[xxxviii]).

Energy

Costa Rica relies strongly on hydropower with over 70% of production. Increased rainfall variability particularly dry spells affect river flows likely leading to lower river levels, and

[xxxviii] https://www.international-climate-initiative.com/en/costa-rica/

thus impacting energy production. Increased temperature and evaporation can further reduce reservoir levels which may stress the system in a similar way that more evaporation can lead to lower river levels which in turn can lead to reduced hydropower production (WB 2021, OECD 2023).

Tourism

The tourism sector, a crucial part of Costa Rica's economy, faces several climate-related risks. Increased frequency and intensity of climate-related events cause direct losses (for example loss of infrastructure and property) and indirect losses (short term business interruption, and long term harm to income attributable to environmental loss). Rising air temperature might increase operational costs and rising sea temperatures affect marine biodiversity and thus reduce the offer of recreational activities (GIZ 2017). The region with the highest tourist activity along the northern and central Pacific is projected to experience the greatest changes in temperature and rainfall with climate change.

Biodiversity and Ecosystem Services

Costa Rica is known worldwide for the exceptional richness and diversity of its natural resources. In addition to many other advantages, these resources have economic value that can be described in terms of ecosystem services. Costa Rica's Forest Law recognizes four environmental services provided by forest ecosystems: (i) mitigation of GHG emissions; (ii) hydrological services, including provision of water for human consumption, irrigation, and energy production; (iii) biodiversity conservation; and (iv) provision of scenic beauty for recreation and ecotourism.

The value of these services will be affected by climate change, and ecosystem indicators already show potential biodiversity shifts in the near future, mostly due to increasing temperature and water scarcity. These shifts are likely to occur at higher elevations, affecting the distribution of species and ecosystem services in the cloud forest. Coastal ecosystems are already impacted by tropical storms and flooding, and impacts will be further amplified by sea level rise. Marine biodiversity is strongly affected by increased sea temperatures (WB 2021, OECD 2023, Copernicus 2019).

Initial desk research suggests that these potential ecosystem impacts have not been modelled over climate timescales; if so, this is a significant information gap in future economic planning.

Summary

Among the several sectors that are impacted by climate-related hazards and climate change, infrastructure has been the central topic of many risk estimates and programmes (see also below) because of its vital role for the economy. Other sectors such as agriculture have received less attention possibly because the registered losses from drought are of a smaller magnitude. A systematic analysis of water scarcity, reduced river flows, and the subsequent impact on hydrological energy production seems missing. Potential losses caused by climate-related impacts on biodiversity and ecosystem services, either direct or the effect on the wider economy have not been quantified. The economic value of ecosystem services would have to be estimated.

UNDRR Global Risk Assessment Framework (GRAF)

Costa Rica's Comisión Nacional de Emergencias (CNE) was an early adopter of the Global Risk Assessment Framework (GRAF) developed by UNDRR to help sovereign institutions reduce risk. The GRAF is a global framework for developing, sharing, and using risk information across hazards, disciplines, and geographic scales. CNE is the lead institution for GRAF in Costa Rica, and its work has provided a firm foundation of information governance and data on which the Global Risk Modelling Alliance and Global Shield can now build.

The GRAF's *Systemic Risk Analysis for Costa Rica* includes assessments of the country's exposure to earthquakes and floods and the potential direct impacts to physical assets and indirect impacts to the wider economy. Direct physical losses, such as damage to buildings and infrastructure, are calculated in a first step which then in turn are used as an input to estimate losses to production, employment, GDP, trade, and household consumption. Direct losses from earthquake predominantly affect residential buildings, educational centres, and the transport system, particularly in urban areas. The estimated losses are highest in San Jose and Alajuela. Indirect losses from earthquake are highest in the production sector and strongly affect employment. According to the assessments, losses in GDP can be predominantly expected through direct infrastructure losses.

Losses from flood also strongly affect residential buildings and the transport system. The regions that are impacted the most are Puntarenas and Limon. Indirect losses from floods are smaller than from earthquake and more localised. Most affected by floods are the agricultural and transport sectors.

Hazard-specific information

This section provides a brief overview of different hazards relevant for Costa Rica and their likelihood affecting each province within the country. Table 2 shows seven quantitative assessments profiling physical asset losses due to Flood, Tropical Cyclone and/or Earthquake(see Table 2). **Note**: **the summary of estimates of losses has been provided through the forthcoming World Bank report *Developing Financial Resilience – A Review of Climate Risks to Transport Infrastructure in Costa Rica*.**

Table 2: Quantitative risk analysis projects since 2012

Acronym (incl. year)	Name	Flood	Tropical Cyclone	Earthquake	Source
CAPRA 2012	Comprehensive Approach to Probabilistic Risk Assessment			X	www.ecapra.org/es/documentos/capra-costa-rica
GAR 2015	UNDRR Global Assessment of risk	X	X	X	www.preventionweb.net/english/hyogo/gar/2015/en/profiles/GAR_Profile_CRI.pdf

WB 2017	World Bank Climate Disaster Risk Profile		X	X	www.documents.worldbank.org/en/publication/documents-reports/documentdetail/270921494485089037/costa-rica-earthquakes-and-hurricanes-risk-profile
GEM 2018	Global Earthquake Model Foundation			X	www.downloads.openquake.org/countryprofiles/CRI.pdf
CCRIF 2023	Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company	X		X	Shared from forthcoming World Bank report
CDRI 2024	Coalition for Disaster Resilient Infrastructure - Global Infrastructure Risk Index	X	X	X	www.giri.unepgrid.ch/facts-figures/multi-hazards
GRAF 2024	UNDRR and CNE Global Risk Assessment Framework	X		X	www.undrr.org/news/costa-rica-making-firm-progress-its-knowledge-systemic-risk

Flood

According to the Global Facility for Disaster Risk Reduction (GFDRR) Platform *ThinkHazard*[xxxix] the risk for flood in Costa Rica is high. This is true for riverine, urban, and coastal flooding including tsunamis. Urban flood risk is high across the entire country. Riverine flood risk is high in the North and along the Caribbean coast, medium in the San Jose province, low in Puntarenas, and very low in Cartago. This is generally aligned with the view of risk of the Aqueduct *Water Risk Atlas*[xl] by the World Resources Institute. According to the Water Risk Atlas the risk of riverine flood is very high in the Heredia province and Northeast of the country and very high for the South of the Puntarenas Province. According to *ThinkHazard* the risk for coastal flood is high along the Pacific coast and medium along the Caribbean coast. The *Water Risk Atlas* estimates coastal flood risk to be low for Costa Rica.

Quantitative estimates of flood risk

[xxxix] www.thinkhazard.org

[xl] www.wri.org/applications/aqueduct/water-risk-atlas

Some globally produced research provides a helpful background for understanding flood risk in Costa Rica. These include the Global Assessment of Risk (UNDRR GAR, 2015), flood estimate conducted by the Caribbean Catastrophe Risk Facility (CCRIF) (2023), the Global Infrastructure Risk Index (GIRI) model from the Coalition for Disaster Resilient Infrastructure (CDRI, 2024), and the Global Risk Assessment Framework (GRAF) Costa Rica project (UNDRR and CNE, 2024).

The values of average annual losses (AAL[xli]) range between US$ 16mn and US$193mn (Figure 1). The four different model estimates of losses include two lower values (GRAF 2024, US$16mn and GAR 2015, US$40mn) and two higher estimates (CDRI 2024, US$170mn and CCRIF 2023 US$193mn). The AAL ratio[xlii] (i.e. normalised by capital stock) ranges from 0.02% to 0.14% whereby the ranking between the estimates remains. The CCRIF estimate is based on an excess-rainfall model, rather than a flood model. In the GAR 2015 model only larger rivers are modelled, and off-floodplain flooding is not considered, meaning that many locations at risk of flooding may not be captured. The flood hazard model used in the GRAF 2024 project is the same as used in GAR 2015, i.e. would have the same shortcomings.

Tropical Cyclone

Tropical cyclone risk from wind is medium in the North and East and low in other parts of the country, according to *ThinkHazard.*

Quantitative estimates of tropical cyclone risk

Three quantitative estimates of losses to physical assets exist, namely from GAR2015, World Bank Climate Disaster Risk Profile 2017, and CDRI GIRI 2024. The estimates of losses from tropical cyclones (wind and storm surge) ranges $0.04mn to $0.25mn for buildings only and $82mn for buildings and infrastructure. The AAL ratios follow the absolute estimates of losses.

Earthquake

The earthquake risk is high in the entire country (*ThinkHazard*). The newest version of the Probabilistic Seismic Hazard Assessment from 2022 as described in Hidalgo-Leiva et al. (2023) contains one of the most updated information data bases regarding seismic parameters. The results show extremely high risk for the Nicoya, Osa, and Burica peninsulas, very high risk for most of the Guanacaste Province, and high risk for about 41% of the country including Central Costa Rica and the capital city of San Jose.

Quantitative estimates of earthquake risk

[xli] Average Annual Loss (AAL) is the long-term expected loss per year, averaged over many years to model the losses for e.g. parametric insurance. AAL is an indication of the amount of savings a nation needs to set aside each year to cover the cost of long-term losses from that hazard.
[xlii] AAL ratio is the AAL per US$ exposure value. How much of every dollar that is exposed can be expected to be lost. This way different estimates of losses can be made more comparable as the effect of different totals for capital stock is excluded by normalising AAL with capital stock.

There are seven quantitative risk estimates for earthquake available from the last 12 years. Additionally, an estimate from CAPRA 2012 and GEM 2018 exists (acronyms see Table 1). The estimated AAL from earthquakes ranges from US$90mn to US$407mn for buildings only, or US$166 to US$526 when including infrastructure (Figure 1), or an AAL loss ratio of 0.09% to 0.62% of the total capital stock (Figure 2).

A systematic review of existing earthquake models and their usability for risk assessments or the development of CDRFI solutions will be conducted under GRMA with results to be expected in Q2 in 2025.

Figure 1: Average Annual Loss (AAL) for earthquake and flood in different risk profiles

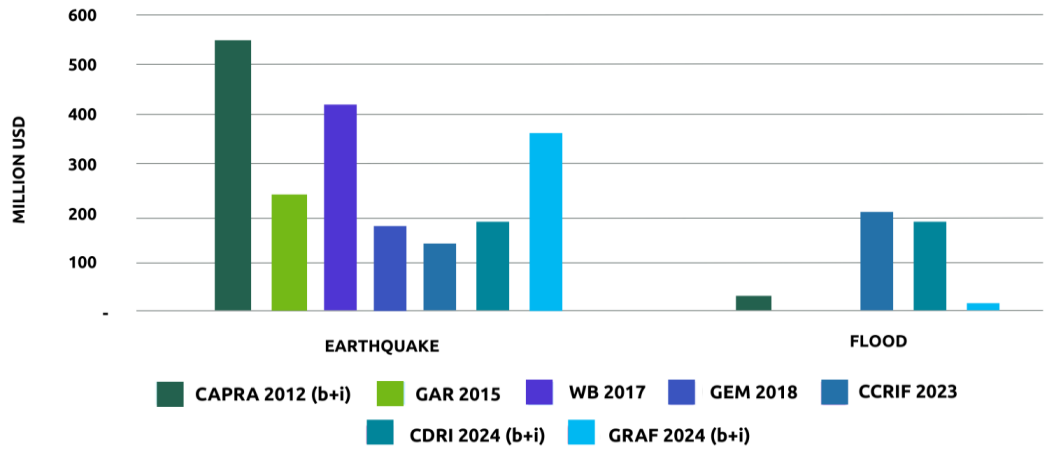
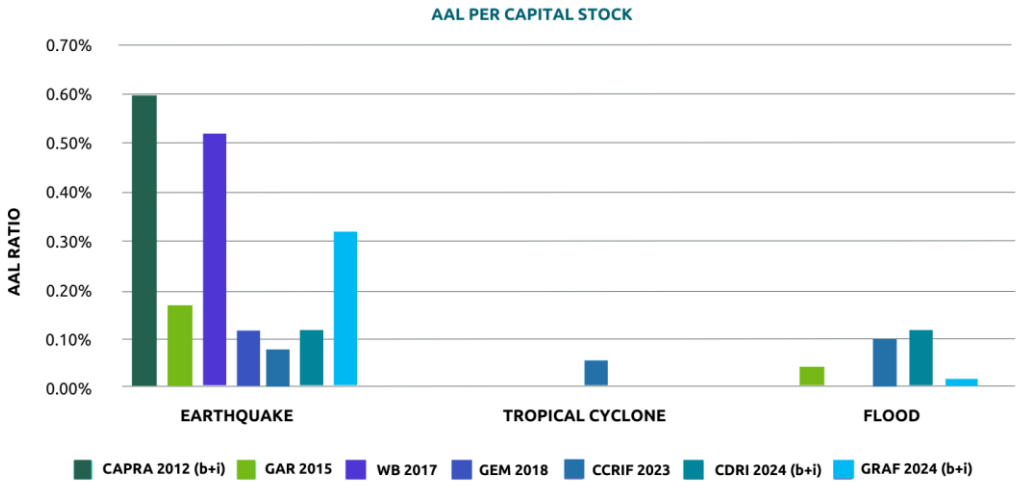


Figure 2: AL ratio (AAL normalised for exposure) for earthquake and flood in different risk profiles



Drought

Heat risk is medium in the entire country. Water scarcity is low or very low (*ThinkHazard 2024*). The *Water RiskAtlas (2024)* estimates the risk for drought high in the Northwest, medium in the North, and medium low in the rest of the country.

Landslide, Volcano, and Wildfire

ThinkHazard provides the following estimates:

Landslide risk is high in the entire country.

Wildfire risk is high in west and south of the country and medium in all other parts of the country.

Risk from volcanic ashfall is high Puntarenas and Limon and medium in all other parts of the country.

A systematic review of existing landslide and volcano ashfall models and their usability for risk assessments or the development of CDRFI solutions will be conducted under GRMA with results to be expected in Q2 in 2025.

Exposure

Each of the risk modeling exercises have created exposure databases which provide an estimate of the total value (replacement value) of physical assets in the country, and its distribution at a specific administrative level. Typically, these databases are based on top-down modeling, using socio-economic, building type and capital stock data at a national or sub-national scale which are then transposed, or downscaled, onto a higher-resolution grid, using data such as geographic population or GDP distribution as approximation. Other efforts try and combine global top-down approaches with regional or local bottom-up approaches where they exist, e.g. GEM. Differences must be considered when comparing estimates of losses or using loss metrics for the development of CDRFI solutions. Using loss ratios, i.e. normalising by exposure value and thus calculating losses as percentage of the exposed total value can be helpful for better comparison

Table 3 provides an overview of the estimated capital stock for the different risk profiles and which elements are included in the exposure databases. The wide range of estimates can partly be explained by the selection of elements included in each study. However substantial differences can also be attributed to methodology which would need to be considered when selecting a source.

The two most recent estimates (CDRI & GRAF) are quite similar for building stock with 97 US$bn and 101US$bn respectively. Differences stem from the incorporation of fewer infrastructure elements in GAR and thus a much lower total for infrastructure exposure (54 vs 8 US$bn). The estimation of indirect losses in other words the impacts on the wider economy as is done in the GRAF report are based on the direct losses. Leaving out critical elements when calculating direct losses could thus affect also the estimation of economic losses.

Table 3: Estimates of total capital stock (not corrected for inflation) for Costa Rica

Risk Profile	Year	Exposure value in billions (USD)	Involves	Specific infrastructure elements included
CAPRA	2012	85	Buildings and infrastructure	
GAR	2015	140	Buildings	
WBCDRP	2017	80	Buildings	
GEM	2018	136	Buildings with content	
CCRIF	2023	175	Buildings and infrastructure (repeated)	Airports, power plants, water, energy, roads
CDRI	2024	151 (97+54)	Buildings (97- excluding commercial and industrial) and key infrastructure (54)	Land transport (roads, railways, bridges, tunnels), telecommunication lines, energy, water utilities, ports and airports, oil and gas facilities
GRAF	2024	109 (101+8)	Buildings (101) and infrastructure (8).	Water utility pipelines, treatment plants, energy transmission lines, power generation plants, roads

Exposure estimates differ substantially in existing risk profiles. The wide range remains between different estimates when normalising for the exposure (Figure 2, AAL ratio from 0.11 to 0.62% per capital stock). The variations between the estimates of losses are therefore not a consequence of variations in exposure value estimates but a different view of risk. The analyses with higher estimates of losses also generate the highest loss ratios.

Looking at the three most recent profiles, (CCRIF, CDRI, GRAF) the relative differences become smaller and can be explained with the incorporation of different infrastructure elements in the estimates

Commercially available quantitative risk models

There is an active market for commercially licensed catastrophe risk models covering Central America for tropical cyclone, earthquake and flood. Such models may have been produced to support indemnity insurance instruments, infrastructure investment projects or for other commercial purposes. The advantage of commercial catastrophe models is that they are generally produced to insurance standards and so have substantial funding, expertise and computer power behind them. This can bring advantages including higher resolution and a higher volume of simulations for probabilistic modelling. However, these features come with restrictions of use, and a price tag, for the model itself and sometimes also for licensed use of the modelling platform.

The **Caribbean Catastrophe Risk Insurance Facility (CCRIF)** offers parametric insurance products for excess rainfall (XSR3.0), earthquakes (Spera Model EQ), and tropical cyclones (Spera Model TC).

The Insurance Development Forum's CatRiskTools[xliii] catalogue shows models voluntarily listed by some leading model vendors. Further **unlisted** commercial models exist.

Available Flood Hazard Maps

Aqueduct Floods[xliv] is an online platform that measures riverine and coastal flood risks under both current baseline conditions and future projections in 2030, 2050, and 2080. In addition to providing **free** hazard maps and assessing risks, Aqueduct Floods enables its users to conduct comprehensive cost-benefit analysis to evaluate the value of dike flood protection strategies

Fathom's Global Flood Map[xlv] provides its users with a robust and comprehensive set of hazard data and flood risk information across all major flood perils: pluvial, fluvial and coastal**.**

Global Risk Modelling Alliance (GRMA) Projects in Costa Rica

The GRMA is a partner initiative to the Global Shield Against Climate Risks, providing services to sovereign institutions to strengthen risk understanding. In 2023 Costa Rica's Ministry of Finance requested support from the GRMA, and mandated SUGESE as the focal point. The GRMA is investing up to EUR2.0m in risk research for the agriculture, tourism and infrastructure sectors. The programme's priorities were co-defined in partnership with SUGESE and Costa Rica's GRMA Technical Working Group.

In partnership with SUGESE and its cross-institution Technical Working Group, the GRMA programme is now providing models, data and capability development in the following areas:

- Multi-hazard analysis of critical infrastructure in one canton to demonstrate a framework for infrastructure risk assessment; to include fluvial, pluvial, coastal flood and earthquake risk
- fluvial and pluvial flood and agricultural drought impacts on crops and livestock
- climate risk to small and medium hotel businesses in the tourism sector; to include fluvial, pluvial, coastal flood and earthquake risk
- multi-hazard impacts on major road infrastructure; to include fluvial, pluvial and coastal flood, earthquake, volcanic hazards and landslide**.**

During the GRMA workshops in Costa Rica, a number of further potential research gaps were also identified (GRMA 2024). These are also included in the conclusions and recommendations in the following section.

Conclusions and Gaps

Costa Rica faces both climate-related and geological risk from several different hazards. Historical data records outlined in this report provide useful orientation but tend to be incomplete due to short recording periods and incomplete or inconsistent recording of event

[xliii] https://catrisktools.oasishub.co/records/?q=costa+rica&selected_facets=
[xliv] https:// https://www.wri.org/data/aqueduct-floods-hazard-maps
[xlv] https://www.fathom.global/product/global-flood-map/

impacts, particularly before the start of CNE's tracking and monitoring system in 2005. Although the records of collated events on number of affected people and economic losses from disaster differ between observational data bases, there is agreement that flood and tropical cyclones have so far led to the greatest monetary losses. However, quantitative risk profiles of potentially frequent and infrequent, yet still plausible, events reveal earthquake as the hazard potentially causing greatest losses.

Flood and tropical cyclones can be considered the most important climate-related hazards however risk from drought, landslide, volcanic activity, and wildfire remain important. Continuous climate change could alter the importance of different hazards and will likely lead to greater impacts from drought and flood through excessive rainfall. Risk models for the major climate-related hazards, i.e. flood and tropical cyclone are available or currently being developed by for example CCRIF (timeline unclear at this stage). In the GRMA project an additional view of risk through pluvial, fluvial, and coastal flood model will further be developed. A systematic overview of existing earthquake, landslide, and volcano models is also carried out under the GRMA.

All but one of the quantitative risk profiles produced over the past decade focus on direct losses to physical assets, e.g. buildings or roads. The GRAF risk analysis extends these estimates with a systemic model of the economy by also calculating indirect losses from flood and earthquake to socio-economic variables e.g. export volume, GDP or wages. The risk estimates to physical assets differ particularly for flood. Some of these differences stem from the use of different models and/or different exposure value estimates.

There is a vast amount of information available for risk assessments in Costa Rica. The National Forum or initiatives like SNIT led by CNE, the risk analysis studies led by IMN, and others plus a plethora of academic articles on climate and disaster risk provide a great risk data base for the country. Most of the information available on natural hazard risk focuses on localised hazard mapping or more generalised risk indexes rather than estimates of losses and damages, which are necessary for the development of CDRFI solutions.

The following sub-sections highlight gaps in the current coverage or quality of risk estimation, using the categories of:

- Understanding and interpretation of existing risk estimates
- Refinement of existing risk information
- Development of new risk estimates for specific hazards and sectors

Where considered relevant, conclusions drawn from GRMA consultations are included, as are new projects that have been requested by Costa Rica's institutions through the GRMA programme.

Category 1: Understanding and interpretation of existing risk estimates

1. **Investigating into the differences of existing probabilistic model results from risk profiles.** This should include an analysis of the uncertainties in existing risk estimates. There are very recent estimates from GRAF, CDRI, and CCRIF which differ particularly for flood. A detailed comparison of estimates of losses, including the understanding of uncertainties and different exposure estimates could be conducted.

2. **Investigate which of the models and modelling approaches used in existing risk estimates are robust enough to be used for CDRFI solutions for Costa Rica.** Several views of risk and models exist specifically for the country and region (e.g. CCRIF) for at least the major hazards. This would require international markets to be confident in the modelled estimates of risk. Model evaluation would include scrutiny of model methodologies, provenance and completeness of source data, examination of assumptions, extent of model validation, treatment of uncertainty and more.

Category 2: Refining existing risk information

3. Creation of a national risk data platform. A central, open catalogue of metadata to describe the characteristics and provenance of available models and data. A wide range of stakeholders would benefit from shared knowledge of what risk information is available, and where to find it. Descriptions should use standards-based metadata, and data sets developed for public good should be based on open-licensing principles wherever possible. This will allow easier collation, sharing, and extension of data sets, and facilitate cross-sectoral exchange and knowledge transfer. The practicality of easily finding existing data sets or the awareness of an existing data set will make the access to risk information more efficient. This includes all components for climate and disaster risk modelling, i.e. hazard, exposure, and vulnerability. This project could support a hosting organisation with the establishment of a new platform or enhance an existing one such as SNIT (SNIT's operational and legal capacity would need to be clarified).

4. Integration of number of affected people in risk estimates with disaggregated population data. None of the quantitative risk estimates includes an exposure layer of population data. With the information available in Costa Rica this could be achieved easily. Disaggregated population data would allow for a differentiation between number of affected people based on gender, rural or urban, income etc. by different hazards.

5. Development of disaggregated estimates of losses to physical assets. Population-sensitive risk estimates have not been the focus of previous analyses. Integrating disaggregated population data into existing model frameworks would allow the refinement of previous estimates of losses based on gender, rural or urban, income etc.

6. Estimation of losses on canton-level. Previous quantitative risk profiles provide estimates on province-level. Risk indicators exist on community level for example through the risk studies of IMN. Estimates of losses on province level might not be sufficient for adequate local decision-making in a geographically diverse country like Costa Rica and the corresponding spatial variations in risk. Combining highly granular information on exposure and people could be combined with previous risk estimates.

The GRMA is conducting a multi-hazard analysis of critical infrastructure in the canton of Heredia to demonstrate a framework for infrastructure risk assessment on spatially high resolution including fluvial, pluvial, coastal flood and earthquake risk. This framework could be applied to other cantons with support of the Global Shield.

7. Extension and refinement of risk estimates by including more exposure categories. For example, the GRAF project's exposure estimate does not include telecommunication lines, bridges, ports, or airports. The important role of ports for Costa Rica's economy is thus not reflected sufficiently in the current GRAF report. The losses from tropical cyclones to telecommunication lines are not accounted for either. A more complete exposure estimate would lead to more realistic estimates of economic losses since indirect losses depend on direct losses to physical assets.

8. Addition of more hazard models to existing risk estimates. The GRAF report only covers the hazards earthquake and riverine floods. Adding different existing hazard models, particularly for tropical cyclones, would allow for the estimation of indirect losses from these hazards within the same framework. Other hazards to be covered could be excessive rainfall or drought.

Category 3: Developing new risk estimates for specific hazards or sectors

9. **Development of a drought model for estimation of losses particularly in the agricultural sector.** None of the quantitative risk profiles include drought as a hazard. The agricultural sector is included in the GRAF project however the greatest impact can be expected from drought conditions. Water scarcity and increasing temperatures can be expected in several regions of Costa Rica and drought intensity and frequency will thus increase in future. A drought index or drought model is necessary for the development of CDRFI solutions.

Through GRMA a drought model will be developed with a focus on the impact on coffee, sugar cane, and livestock for a region yet to be defined with partners in Costa Rica. The model could be further developed and/or transferred to other regions within the country and applied to different agricultural commodities under the Global Shield.

10. **Development of a multiple-hazard risk assessment for water, sanitation, and health sectors** supporting ongoing efforts of Acueductos y Alcantarillados (AyA) and their existing GIRA tool (*Guía de Gestión Integral de Riesgos para ASADAS*). Clinical services would also benefit from such an assessment. Key infrastructure elements of public water networks vulnerable to climate-related hazards could be identified or taken from the GRAF project. A further related element could include risk mapping of regions with water scarcity expected in future. This would be complementary with water resources management and climate change adaptation targets identified in the NAP.

11. **Development of risk estimates for the energy sector (mainly hydropower) through water scarcity.** About 75% Costa Rica's energy production is based on hydropower. Changing rainfall amounts and/or rainfall seasonality can affect river water levels and in turn affect energy production. An assessment of existing and suitable hydrological models also used for riverine floods would precede the risk estimate.

12. **Quantification of ecosystem services through its economic value and/or a biodiversity index for risk estimations**. Risk understanding around ecosystem services options for financial derisking was mentioned as an area of interest from a wide

range of stakeholders within the GRMA project, but did not make the list of top priorities. Research into risk to natural capital would align with other active projects such as Payment for Environmental Services Program and Conservation or Trust Funds under MINAE, such as Forever Costa Rica Association or Fonafifo. The value of ecosystems and biodiversity also prominently features in the NAP. During GRMA consultations a potential priority region was identified as could be the Caribbean coast and the beneficial effect of mangroves.

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Annex 4: Summary table of national policies and strategies linked to CDRFI

National Policy / Strategy / Framework	Responsible	Description	Link to CDRFI
Nationally Determined Contribution (2020).	MINAE - Ministry of Environment and Energy) Climate Change Directorate (DCC).	In terms of the main adaptation goal, Costa Rica is committed to strengthening the country's social, economic and environmental resilience conditions in the face of the effects of climate change, through the development of capacities and information for decision-making, the inclusion of adaptation criteria in financing and planning instruments, the adaptation of public services, productive systems and infrastructure, and the implementation of nature-based solutions. Costa Rica's contributions (updated in 2020 and currently being updated) are presented in 13 areas identified as priorities for society and the economy. In the context of this study, the contribution is of interest indirectly in	• ***Infrastructure and construction:*** Costa Rica's contribution in infrastructure is focused on risk assessment and the incorporation of adaptation at all stages of the project life cycle, so that the protection of infrastructure and continuity of services contribute to the resilience of populations and communities, and on the adoption of low-emission and sustainable materials and practices. Contribution 4.3: the country will incorporate climate change adaptation criteria in regulations and guidelines for public investment to ensure their robustness to climate impacts. Contribution 4.4.: by 2030, applications of guidelines with adaptation criteria, institutional articulation efforts and improvements in response capacity, among others, will have been developed to ensure the protection of infrastructure and the continuity of vital public services in the face of extreme hydrometeorological events. *NDC Target 15.3: By 2030 the Ministry of Finance has a proposal for financial protection measures for climate change and variability impacts applicable to public assets.* • ***Finance:*** Costa Rica's contribution is focused on developing a financial sector that can recognise and manage the risks associated with climate change and actions to address it while taking an active role in supporting climate action throughout the economy.

		the area of infrastructure and construction and directly in the area of finance.	• Contribution 12.3: to mobilise the financial system, including the Development Banking System so that by 2030 the market has financial products to support decarbonisation and resilience. • Contribution 12.4: Costa Rica is committed to strengthening financial instruments such as payment for ecosystem services, levies and other carbon pricing instruments, as well as insurance, tariff and fiscal instruments, to finance adaptation and mitigation needs. • Contribution 12.5: Costa Rica is committed to identifying climate actions in the annual budget periods, with the aim of having financial protection measures against climate change and variability. Currently, MINAE, together with the DCC, is working on updating and developing the NDC 3.0, which would be a valuable opportunity to incorporate financial and insurance solutions for disasters and climate risks in line with the strategies supporting pre-established financing.
Costa Rica's National Climate Change Adaptation Policy 2018-2030 (PNACC) and National Climate Change Adaptation Plan 2020-2026 (NAP).	MINAE - Ministry of Environment and Energy) - DCC.	The PNACC is configured based on six axes, in accordance with the sectors identified in the Policy's diagnosis as the most vulnerable to the adverse effects of climate change (mentioned in section 2b). For these axes, substantive and instrumental guidelines are defined.	• *Area 6. Investment and financial security for climate action*: to provide public and private financial resources in order to effectively implement adaptation measures and reduce losses and damages for vulnerable populations due to the adverse impacts of climate change. This should be done in a transparent and verifiable manner, with financial conditions for the active inclusion in the local economy of vulnerable populations, particularly women, through productive climate-resilient investments. o Guideline 6.3: Incorporation of adaptation criteria into financial risk transfer instruments such as guarantees, insurance and reinsurance. o Outcome: new insurance and reinsurance products that incorporate and recognise adaptation measures to reduce risk in processes. o NAP targets (period 2022-2026): ▪ 40% of insurers incorporate issues related to climate change risk into their governance and risk management infrastructure. ▪ Two (2) instruments (methodologies, guides, analysis, strategy) for the incorporation of adaptation criteria into financial risk transfer instruments such as guarantees, insurance and reinsurance.

			• An insurance guide for public entities. • A diagnosis that evaluates access to financial instruments (insurance and reinsurance) associated with climate risk by vulnerable sectors and/or regions. ▪ 100% of public service institutions have insurance as part of their business continuity programme. • 100% of institutions regulated by the Public Authority for the Regulation of Public Services (ARESEP) have insurance as part of their business continuity programme.
National Risk Management Policy 2016-2030 (PNGR) and National Risk Management Plan (2021-2025).	Comisión Nacional de Emergencias	The strategic objective of the PNGR is to provide for the design and implementation of a long-term economic and financial risk reduction strategy, which enables the analysis and prospective management of risk in public works investment and state services. The National Risk Management Plan emphasises financial protection as one of the main national challenges, with it being the most relevant, urgent and priority issue that the plan takes into consideration. For this purpose, it establishes the need to adopt a financial management strategy (see below) that contributes to an adequate identification of risks, the estimation of	• *Thematic area 4:* Sustainable financial investment, infrastructure and services. The strategic objective of this axis is to provide for the design and implementation of a long-term economic and financial risk reduction strategy, which enables the analysis and prospective management of risk in public works investment and state services. o *Expected result*: damage and losses in infrastructure and public services in the country have been reduced. o *Result indicator*: percentage of state infrastructure and services protected, with reduced damage and losses. • *Recovery action area* o *Guideline 3: Social protection and compensation:* ▪ Lines of financing for housing recovery: 100% of families affected by disasters have access to various lines of financing for housing recovery. ▪ Crop insurance as an alternative for phenomena affecting agricultural production: 75% of small and medium producers referred to crop insurance for losses due to disasters. ▪ Instruments or alternative procedures for compensating social programmes due to disasters: 75% of projected aimed at female entrepreneurs affected by disasters funded. o *Guideline 18: financial availability*

		the potential losses that could occur and the generation of various protection instruments and availability of resources[xlvi]. It also highlights the protection of infrastructure and services and the need to generate a culture of insurance in the public sector.	▪ *Protection mechanisms within the range of the National Financial Sector* ▪ Insurance and reserves for the recovery of public infrastructure
National Strategy for Disaster Risk Financial Management (ENGFRD)	Ministerio de Hacienda y CNE	This is the strategic framework that reflects the Ministry of Finance's commitment to strengthen the management of fiscal risks arising from natural disasters and to mitigate the fiscal impact of these events. The strategy is linked to other planning instruments in force in the country, mentioned in this document: - National Development and Public Investment Plan 2019-2022 - National Law on Emergencies and Risk	• *Guideline 1: have quantitative profiles of fiscal risks associated with disasters.* This guideline aims to identify, understand and quantify the fiscal risk associated with disasters. • *Guideline 2: Have adequate instruments to handle the fiscal risks associated with disasters.* The ENGFRD states that *"disasters associated with natural events generate sudden and unexpected expenses and decreases in tax revenues that make it necessary to make adjustments in the public budget to finance requirements during and after the event, as well as for the possible tax revenues that may not be received."*[xlvii]

[xlvi] Plan Nacional de Gestión del Riesgo, 2020-2025.
[xlvii] Estrategia Nacional de Gestión Financiera del Riesgo de Desastres, 2023

Prevention and its Regulation (Law No. 8488): National Risk Management Plan (2016-2030)
- National Climate Change Strategy: National Climate Change Adaptation Plan (2018-2030) and the National Decarbonisation Plan
- National Bioeconomy Strategy (2020-2030).

In the strategy, four fundamental guidelines are defined, which are the basis for the current development of the implementation plan as an operational instrument.

1. Guideline 1: have quantitative profiles of fiscal risks associated with disasters.
2. Guideline 2: have adequate instruments to handle the fiscal risks associated with disasters.
3. Guideline 3: strengthen the resilience of public investment to disasters with a multi-sectoral approach.
4. Guideline 4: promote dissemination, transparency and accountability in

		disaster risk financial management.	
National Plan of Action on Gender Equality in Climate Action	INAMU y MINAE-DCC	The plan's general aim is to contribute towards the coordination of multisectoral actions that promote the reduction of the differentiated impacts of the climate crisis on women in their diversity, especially those in more vulnerable situations, in strategic sectors through employability and strengthening of economic autonomy, capacity building and innovation, risk management, incorporation of an intersectional perspective on gender in climate action, and production of disaggregated data. The plan began as part of the NDC update in 2020 and is the result of joint effort amongst the MINAE-DCC, INAMU and UNDP.	• *Strategic Area 4 Climate Change Management:* to ensure that women in their diversity have tools and information to increase their ability for resilience against climate crises and improve institutional and community conditions for comprehensive responsive risk management (6 actions). ○ Action 4.1: Implemented the Gender Mainstreaming Strategy in the National Risk Management System. ○ Action 4.2: increase sectoral planning instruments for comprehensive risk management with considerations on gender quality and empowerment of women in their diversity. ○ Action 4.3: increased/made visible attention to women in their diversity and women's organisations in social welfare programmes for recovery from climate crisis emergencies and disasters.
Strategy for Mainstreaming Gender Equality in the National Disaster Risk	CNE	Its goal is to mainstream the gender equality approach across the three sub-systematic areas of the PNGRD: risk reduction, preparedness, response and recovery[102]. The strategy clarifies the approach to	**Livelihood Recovery Component** **Objective:** Include gender equality criteria in the recovery subsystem that makes the impact on women's livelihoods visible. **Recovery scope:** **Strategic action:** Lines of financing for recovery of housing for women.

Management System (2023-2027).	ensuring the full and effective participation of women, the protection of their rights and the elimination of gender gaps that give rise to inequality and discrimination in risk reduction, disaster response and recovery.	• Product: Families affected by disasters with housing damage, registered in the Digital System of Housing Emergencies disaggregated by gender, sex, age, disability and migratory status, are guided on the possibilities of state support in housing. **Strategic action:** Alternative instruments or procedures for compensating social programs in the event of disasters • Product: Financing of projects aimed at women entrepreneurs affected by emergency or disaster. **Strategic action:** Programme for the attention of the population depending on agricultural sector in emergencies, with a gender approach. • Product: Attention to requests for differential treatment in loans to Inder beneficiaries, in the event of a declared emergency, to opt for a 2% reduction in the interest rate, in accordance with the provisions of its current regulations and internal regulations. **Strategic action:** Quantification of damage and loss disaggregated in data of affected people according to sex, gender, age, disability and ethnicity • Product: General emergency plans with reports of damage and loss of affected persons before the declaration of emergencies, disaggregated by sex, gender, age, ethnicity, migratory status and disability, submitted by the competent institution.

Annex 5: CDRFI Regulatory Assessment

This report was developed by the Access to Insurance Initiative (A2ii) Secretariat. Final version: October 2024.

Executive Summary

Overall, the legal, regulatory and institutional framework for the insurance sector in Costa Rica is well-developed. SUGESE, the insurance regulator, is well-established and is overseen by the National Council for the Supervision of the Financial System (CONASSIF). Its supervisory mandate, which includes the promotion of financial inclusion and sustainable development, is well supported by law. It is also an active member of the International Association of insurance Supervisors (IAIS). SUGESE has undertaken important prudential reform over the years and is currently continuing its critical work to align its capital framework with Solvency II, while streamlining and strengthening the consumer protection framework. Plans are under way to work with the IAIS to conduct an assessment against the Insurance Core Principles in 2025.

Costa Rica's regulatory framework provides an enabling framework for the offering and innovation of CDRFI and inclusive insurance products. The market (i) has a transparent and open licensing regime (i) has a flexible approach to the introduction of new products with clear timelines (iii) allows for various alternative modes of distribution (iv) supports access to reinsurance and, subject to some conditions, insurance abroad, as well as (v) supports digital processes. Parametric insurance is regulated as a standard insurance product and there is a dedicated inclusive insurance framework that allows for use of alternative channels for simple products. No blanket restrictions on product pricing, design or cost management practices were found.

The more significant factor impeding the growth of CDRFI is the lack of demand and supply. While traditional fire insurance which includes catastrophe cover is a common offering, uptake is low. While Costa Rica already has a relatively advanced DRM and disaster risk financing (DRF) policy in place, insurance does not yet play a significant role at the government, business or household levels. The overall level of knowledge of insurance in the public and private sectors is low. Other than the state insurer INS, the insurance sector currently has limited financial appetite to offer innovative, needs-based CDRFI products as they are currently focused on consolidation and growth. In the last 3 years, there has been an attempt to pilot parametric agricultural insurance but this has not achieved strong uptake.

Supervisory Mandate and Role

SUGESE, the General Superintendency of Insurance, was established in 2008 and is overseen by the National Council for the Supervision of the Financial System (CONASSIF)[xlviii]. CONASSIF and all four superintendencies have technical independence from the Central Bank to avoid conflicts of interest between financial regulation and monetary policy in Costa Rica.

The Insurance Market Regulatory Law No. 8653 (Law 8653) sets out the overall principles, objectives and rules under which the insurance market should operate, as well as the mandate of SUGESE[xlix]. SUGESE's mandate includes the promotion of inclusion, reduction of protection gaps, sustainable development and technological innovation[l]. Another key aspect of SUGESE's mandate is to promote a fair, efficient and competitive insurance market that provides consumers with quality products. SUGESE is obliged to report anti-competitive practices to the Commission to Promote Competition. SUGESE's accountability is upheld through annual institutional reports required by the Law for Perfecting Accountability, with all reports made available online, enhancing transparency.

Costa Rica is an OECD country and the insurance sector and regulatory framework has been assessed as part of the OECD accession process. SUGESE is a member of the International Association of Insurance Supervisors (IAIS)[li] and the Association of Insurance Supervisors for Latin America (ASSAL). As of 2024, SUGESE chairs the IAIS Financial Inclusion Forum and is a member of the Sustainable Insurance Forum. SUGESE was one of the first supervisors to become a signatory of the United Nations Environment Programme Principles for Sustainable Insurance (UNEP FI PSI).

SUGESE is a key driver of Costa Rica's climate adaptation efforts. SUGESE is listed as a key responsible institution for two goals[lii] under Costa Rica's National Adaptation Plan 2022 - 2026, which explicitly identifies insurance as a key work item. SUGESE is working with the Ministry of Finance on the national disaster risk financial management strategy. SUGESE, together with the UNEP FI PSI, signed a declaration for the development of a National Sustainable Insurance Strategy for Costa Rica in 2018, an act of recognition by the participants of the Costa Rican insurance market of the importance of addressing environmental, social and governance issues. More recently in October 2023, SUGESE and other superintendencies

[xlviii] The supervisory and regulatory structure of the Costa Rican financial system is composed of five different bodies. CONASSIF supervises the four superintendencies: General Superintendency of Financial Institutions (SUGEF), General Superintendency of Securities (SUGEVAL) and Superintendency of Pensions (SUPEN) and General Superintendency for Insurance (SUGESE). CONASSIF approves regulations for the financial system and SUGESE issues resolutions and guidelines on insurance (circulars, letters, resolutions, legal criteria and opinions).
[xlix] SUGESE's mandate is 'to oversee the stable and efficient operation of the insurance market of Costa Rica and deliver the fullest possible information to policyholders' (Law 8653, Article 29)
[l] This was based on a legal analysis of the Law 8653 and is documented in a legal opinion, which states considers that the promotion of inclusion and reduction of protection gaps, education and awareness in insurance, sustainable development and technological innovation are aligned with the objectives and indicators of market development, are linked to consumer protection and therefore part of SUGESE's mandate.
[li] In Q4 2024, SUGESE and IAIS will carry out a Member Assessment Process to assess SUGESE's compliance with the Insurance Core Principles.
[lii] 1) 40% of insurance companies manage risks related to climate change and 2) insurance guide to public entities. https://cambioclimatico.minae.go.cr/wp-content/uploads/2022/04/NAP_Documento-2022-2026_VC.pdf (page 187)

signed a commitment to promote a more sustainable financial system that is resilient to climate change[liii].

Law 8653 also regulates insurance, reinsurance, and insurance intermediation activities in Costa Rica. It sets out fundamental provisions defining insurance business, authorisation of market participants (risk carriers, intermediaries, auxilliary services), capital requirements and market conduct. These are supplemented by other legislation such as the Law 8596 Law Regulating Insurance Contracts, secondary legislation issued by CONASSIF, and complementary guidelines (circulars, letters, resolutions, legal criteria and opinions) by SUGESE, which are available on the SUGESE website[liv].

Inclusive insurance and CDRI is a key priority for SUGESE as Costa Rica faces significant climate risk exposures. A 2017 self-diagnostic assessment conducted by SUGESE based on the A2ii Country Diagnostic Toolkit[lv] identified key vulnerable groups as low-income individuals, women heads of households, small and medium farmers, tourism entrepreneurs, and indigenous people. SUGESE seeks to ensure that there are conditions that enable inclusive products to be developed (data, capabilities, regulation). SUGESE believes that there is currently a lack of knowledge about insurance in the public and private sectors.

Market Overview

The Costa Rican market is an open market. Entities are at any time able to apply for new insurer licenses or enter into mergers and acquisitions with local insurers. The requirements for authorisations and registrations are available on the SUGESE website.

Licenses are granted by insurance category: (a) personal insurance (b) general insurance and (c) mixed: personal and general[lvi]. Beyond the local market, regulation allows for two avenues of obtaining CDRI abroad which can potentially fill local market gaps:

- Article 13 of the Regulation on the Commercialization of Insurance makes a provision for "Lines Not Offered (Surplus)", where if risk coverage is not available in the Costa Rican market due to its complexity or particularity, there is the possibility of insuring it cross-border. There is a first-right-of-refusal requirement where the client first has to obtain quotations from at least 3 insurance companies, but upon receiving negative responses, the client is allowed to obtain the cover abroad from countries with whom Costa Rica has an international treaty (this includes EU and the US).
- A policyholder such as the government or an organization can technically (without the quotation requirement above) obtain parametric insurance on a cross-border basis. With parametric insurance, the loss assessment is not done locally but rather via remote

[liii] https://www.sugese.fi.cr/seccion-publicaciones/Informes/Declaratoria%20de%20compromiso.pdf
[liv] CONASSIF supervises the four superintendencies: General Superintendency of Financial Institutions (SUGEF), General Superintendency of Securities (SUGEVAL) and Superintendency of Pensions (SUPEN) and General Superintendency for Insurance (SUGESE). CONASSIF holds the authority to issue regulations, although SUGESE takes on the role of proposing and drafting the regulations.
[lv] https://a2ii.org/en/knowledge-center/toolkit-1-country-diagnostic-studies-analytical-framework-and-methodology
[lvi] General Insurance: Insurance related to risks of loss or damage to objects, animals, plants, or assets. Personal Insurance: Insurance related to risks to people's lives, and risks to physical integrity and health.

verification of data. Therefore, it does not contravene any provisions restricting the conduct of the business of insurance locally by non-domiciled parties.

As of 2024, there were 12[lvii] insurers operating in Costa Rica, including the state-owned Instituto Nacional de Seguros (INS). INS[lviii] is the insurer with the largest market share in Costa Rica and since the market opening in 2008, has actively competed with private insurers. The market share of INS, excluding compulsory products, reduced steadily from 62,5% to 54,2% in the last 5 years.

Out of the 12 insurers, 8 currently offer CDRI-related products while 10 indicated they offer inclusive insurance products as at 2023. The existing CDRI products are registered under the fire and allied lines branch. Out of the insurers offering CDRI, only INS currently offers products that go beyond traditional catastrophe-related risks to address broader climate-change related risks and adaptation measures, such as public infrastructure claims insurance, parametric crop insurance for excess of rain and electric car insurance. There are no locally-incorporated reinsurers in Costa Rica, with the exception that INS is allowed to provide reinsurance. Insurers largely access reinsurance abroad in the European or US markets and there are no regulatory restrictions on obtaining reinsurance abroad.

Intermediaries are licensed as (i) insurance brokerage companies (ii) agencies (iii) individual brokers (iv) individual agents or (v) self-issued insurance operators and are subject to explicit conduct and training requirements[lix]. Self-issued insurance intermediaries are only allowed to offer self-issued insurance (see further section below on the RIAS framework) and subject to proportionately less complex training requirements[lx], thus opening the option for insurers to distribute products through alternative distribution channels that operate in inclusive communities. Insurance and brokers' businesses (Items (i) to (iv)) are required to solely focus on insurance activities. Intermediaries that are not solely insurance-focused intermediaries can only offer insurance by registering as self-issued insurance operators.

SUGESE's registry of self-issued insurance operators is on SUGESE's website. It currently has 82 active operators including banks, call centers, websites, mobile applications, in-person, vending machines. As at June 2024, they offer 15% of insurance policies in the market. In practice it is also common in Costa Rica's that entities such as banks take on group policies

[lvii] One insurer, Triple-S, exited in 2022 and was bought over by ASSA due to change in business strategy.
[lviii] INS offers personal insurance, damage insurance, solidarity insurance that includes Work Risk Insurance (RT), and Compulsory Automobile Insurance (SOA), as well as comprehensive crop insurance (Presidency of CR, 2021). INS is governed by a dedicated law - Ley del Instituto Nacional de Seguros or the National Insurance Institute Law and was originally set up to ensure the availability of key compulsory products. It currently constitutes 75% of market premiums. Private insurers are also allowed to offer compulsory lines, but have been reluctant due to regulatory profit caps.
[lix] Requirements on the competence and conduct of intermediaries are set out in Law 8653, Regulations on Insurance Distribution as well as specific requirements in the Agreement SUGESE 11-20 Regulation on Inclusion and Access to Insurance (RIAS) for self-issued insurance operators. Note that insurance agencies and brokerage firms may only engage in intermediation activity through insurance agents and brokers, respectively; insurance agents can work without a link with an agency.
[lx] Annex V of the Commercialisation regulation

that provide life or non-life cover to their loanholders, whereby they may source insurance from intermediaries but are themselves not an intermediary.

Non-intermediated distribution

An important regulatory provision is the "seguro paritario"[lxi] or free discussion agreements, which is an insurance contract that is freely negotiated between large organizations with the insurer, on the principle that such organizations have equal bargaining power. It is customized to the policyholder and is not offered on a mass basis. The amount of the annual premium of the contract must be equal or higher than two hundred thousand Development Units[lxii]. Such agreements are not subject to product registration requirements. The free discussion agreements can be leveraged by meso and macro setups for larger organisations or for risks that meet the minimum premium requirement.

Industry capacity

Overall, the insurance market of Costa Rica is on financially steady ground. In the last 5 years, general insurers have maintained regulatory capital adequacy ratios above the required minimum of 1.30, profitability has been positive and insurers have seen continuous premium and asset growth. The general insurance market has seen sustained, above-GDP premium growth since opening in 2008. SUGESE is actively monitoring insurers' risk management practices, which show some room for improvement.

Regardless, SUGESE acknowledges that not all insurers would be able or interested to offer CDRI, but rather interest is more likely to arise from a few "CDRI leaders": insurers who have the mandate or socially-driven strategy, financial and risk management capacity, as well as access to capital, reinsurance, and technical expertise to do so.

At present, the capacity of local insurers to offer CDRI is constrained by capacity, access to climate data and climate risk modeling systems, cost of reinsurance, market size and the level of sophistication of insurance consumers. Like many countries, insurers are in the early stages of quantifying, monitoring and responding to climate risk.

INS continues to offer 94% of CDRI products. However, some private general insurers have indicated genuine interest in CDRI. Private insurers are prioritizing growth and consolidation of business and are expected to become more able to offer CDRI in the coming years.

Prudential Regulation

Capital requirements are risk-based. SUGESE has been undertaking significant efforts over the last ten years to enhance its risk-based capital and risk-based supervision in line with

[lxi] See article 25 (k) of Insurance Market Regulatory Law No. 8653 and chapter IV of Regulation on the Registration of Insurance Products.

[lxii] 200,000 Development Units or Unidades de Desarrollo (unit of account linked to inflation), are equivalent to around USD391,000 at the time of writing. https://gee.bccr.fi.cr/indicadoreseconomicos/Cuadros/frmVerCatCuadro.aspx?idioma=1&CodCuadro=%20349

international best practice, including aligning with IFRS17[lxiii]. SUGESE considers that current solvency regulations are sufficiently flexible to capture catastrophe-related risk for the purposes of underwriting. SUGESE also maintains an open approach to receiving insurer feedback on prudential regulation, and has on adopted changes based on such feedback where appropriate.

Moving forward, reform of the risk-based capital approach will be undertaken under the Strategic Plan 2024-2028. The changes are expected to better align with Solvency II, allowing for better risk measurement, as well as a more forward-looking prospective capital model adjusted to the characteristics of each insurer.

SUGESE's efforts are ongoing to support insurers with integrating climate-related risks. A key milestone is the issuance of the Best Practice Guide for the Management of Climate Change Related Risks (CCRR) in November 2023, which specifies comprehensive guidance[lxiv] on how insurers should respond to CCRR. Implementation of the CCRR is fully voluntary for insurers and is at early stages. SUGESE is monitoring and supporting the industry with implementation.

SUGESE has been actively working with the industry since 2016 to build up their climate risk management capacity and continues to do so. For example, the industry has emphasised a strong need for better climate data and modelling. SUGESE is taking steps such as (i) assessing the quality of insurer data for the purposes of monitoring climate risk and (ii) coordinating efforts with the National Emergency Commission and the Central Bank of Costa Rica so that climate information is available to the insurance industry and its climate exposure can be measured.

Consumer Protection

Costa Rica has a robust consumer protection approach that SUGESE considers is sufficient to address any CDRI-related conduct risks. The overarching consumer protection objectives, fundamental contracting obligations and SUGESE's market conduct mandate are covered in the Law 8653 and Law 8956[lxv]. This is supported by a number of secondary legislation that specify more detailed requirements (see Table). At the time of writing, SUGESE has drafted[lxvi] a comprehensive consumer protection framework to streamline its conduct

[lxiii] See Regulation on the Solvency of Insurance and Reinsurance Companies (SUGESE Regulation 02-13). All catastrophic coverages have a specific capital requirement. Both the Solvency Regulation and the Regulation on the Registration of Insurance Products allow for the identification of insurers' exposures to catastrophic risks.
[lxiv] It includes all areas mentioned below - monitoring, ORSA, stress test - and more. Best practice 1. Corporate governance and strategy, Best practice 2. Risk exposure and risk appetite, Best Practice 3. Risk Management and Internal Controls, Best practice 4. Insurance underwriting risk management, Best Practice 5. Reinsurance and other risk transfer mechanisms, Best practice 6. Asset management and valuation, Best practice 7. Management and valuation of liabilities- Best practice 8. Solvency management Best Practice 9. Scenario Design and Stress Testing Best practice 11. Distribution channel management Best practice 12. Market conduct Best practice 13. New product development.
[lxv] Costa Rica also has a general consumer law, Ley de Promoción de la Competencia y Defensa Efectiva del Consumidor N° 7472.
[lxvi] At the time of writing in July 2024

approach, while updating existing regulatory frameworks[lxvii]. The framework is due for public consultation in the second half of 2024. Its main aims are as follows:

- Insurance companies and insurance intermediaries have a business conduct focused on the fair treatment of consumers, for the benefit of their subjective rights and legitimate interests; and
- In a complementary manner, strengthen confidence in the market and its inclusive and sustainable use by consumers; as well as
- Mitigate the reputational and prudential risks of the providers that may derive from the materialization of conduct risks.

This significant update closely aligns with the Insurance Core Principle 19 Conduct of Business and the ensuing IAIS guidance, and marks a shift towards outcomes-focused, risk-based conduct supervision in line with international best practice[lxviii]. Such a risk-based approach will enable SUGESE to more effectively target and address consumer protection issues. It should also be noted that conduct risks with regard to meso- and macro-level schemes would be lower compared to micro-level insurance products sold to individuals.

[lxvii] Key enhancements are in the area of disclosure, information delivery and group insurance.
[lxviii] The update also took into consideration OECD recommendations from Costa Rica's accession process, as well as the G20/OECD "High Level Principles for Financial Consumer Protection".

Document	Relevant Features
SUGESE 03-10 Agreement Regulations on Insurance Commercialisation	• Regulates insurance promotion and marketing, disclosure, training requirements for the creation of for individual and corporate insurance intermediaries.
The Regulations for Inclusion and Access to Insurance (RIAS) (2020)	• Sets out adapted consumer protection requirements for products targeted at inclusive insurance customers, to ensure that vulnerable consumers who are at higher risk of poor conduct outcomes are effectively protected. • The RIAS defines an overarching category of products called "self-issued insurance" (autoexpedibles), which includes three sub-categories: a. "inclusive insurance," which refers to insurance products offered to excluded or underserved sectors of the market regardless of their level of economic income, b. "microinsurance," understood as insurance directed to low-income sectors of the population, and c. "mass insurance," understood as insurance that can be commercialized to mass markets (no-advice) • Customers of these products must, for example, be provided with a summary sheet[lxix] of the policy and claims are required to be resolved within 10 business days compared to 30 calendar days for traditional insurance. • Requires insurers to submit a "Self-issued Insurance Analysis" to ensure consistency with the required product characteristics in the RIAS, that the product and distribution are customer-centric and appropriate.
Group Insurance Regulations	• Addresses the rights and obligations of the insurer, the group policyholder and the insured individuals, with a strong focus on transparency, informed consent and choice for insured individuals, particularly where the insured pays a premium and where policy changes arise[lxx]. • Includes a provision that information on fees ("insurance brokerage fees, fees for the policyholder for administrative and collection work, as well as the proportion that these items represent within the commercial premium for each product or contract") must be submitted to SUGESE.

[lxix] The standardized and summarized document on self-issued insurance or acronym DERSA in Spanish
[lxx] Specific market conduct challenges have occurred in bank-led group insurance schemes where, due to the lack of disclosure and lack of control of the individual policy members over policy changes and replacements, consumers have found to have lost their coverage or seen unexpected premium increases. In response, SUGESE has enhanced requirements regarding disclosure and introduced a grace period for consent in the group insurance regulation / new draft consumer protection framework (cite). However, at present this issue has not affected yearly-renewable non-life products and SUGESE does not currently see this as a significant conduct risk to CDRI.

Agreement SUGESE 06-13, called "Regulations for the Defense and Protection of Insurance Consumers".	• Would be superseded by the new consumer protection framework once approved. Currently defines minimum requirements on providing timely responses to consumers, complaints and disputes, and the mandatory setup of a dedicated unit to handle claims and complaints. • Includes a provision (see Article 15(n) for details) that there must be specific policies and procedures for situations declared as national emergency by the government as well as where defined as catastrophic by the insurer under the policy contract, to ensure prompt handling of claims, queries and complaints from affected policyholders.

SUGESE has a dedicated market conduct unit that oversees market conduct supervision and deals with complaints. Complaints are directed to SUGESE only if consumers wish to pursue the matter further after a final response from the insurer. Additionally, SUGESE has a fully digital insurance complaints platform that generates data by insurers, insurance categories, branches, modalities (group vs. individual, micro-insurance, and others), products, and others. This will enable SUGESE to track consumer issues regarding CDRI products relatively easily.

SUGESE's consumer protection regulations, particularly with the upcoming reform, are sufficiently principles-based that concerns specific to CDRI[lxxi] are largely able to be addressed. For instance, the Commercialization agreement notes that disclosure must include "Information about the product, including the associated risks". This is broad enough to expect that insurers and intermediaries should be transparent about the basis risk associated with index insurance products.

Product oversight

Under the SUGESE Agreement 08-14 (Regulation on the registration of insurance products) insurance products must be registered with SUGESE prior to being promoted, publicised or offered. SUGESE maintains an online Insurance Product Registry that is accessible to the public.

SUGESE adopts a file-and-use system where they review the product documentation to ensure completeness and compliance with the specified templates. SUGESE does not approve products prior to launch, but can request for clarifications or revisions to the contractual and technical product documentation or order the insurer to cease offering of the product. SUGESE does not require updates on repricing as long as methodology did not change.

SUGESE responds within 5 business days whether the product registration documentation is complete, so that the process can be completed within 10 business days. If SUGESE does not respond within 5 business days, the product is automatically deemed registered.

[lxxi] SUGESE's legal opinion on parametric insurance noted that such products may raise the following conduct issues: product development (basis risk, credible and objective indices or parameters), the use of ex gratia payments, competence, implication of subsidies on cost to consumer, and product solvency.

Registration of products under the RIAS are also subject to the same timelines[lxxii]. In principle, insurers offering CDRI have the responsibility and freedom to decide the product category that best suits their offering. The main advantage of registering a product as a RIAS product is the option to leverage a wider range of distribution channels that are not subject to the same level of training requirements as traditional insurance intermediaries.

As an exception to the above requirements, products that fall under the "equal or free discussion" (seguro paritario) category may be offered on a notification basis, where insurers submit a simplified list of documents to SUGESE after the contract has been signed.

SUGESE does not have any requirements on obligatory CDRI provision or bans on cancellations or non-renewals of insurance products by insurers. Currently there is no provision for regulatory sandboxes. However, there is no evidence that points to a need for sandboxes for the purposes of encouraging CDRI product provision, as SUGESE's product oversight rules are flexible, allowing for the launch of new innovative products and subsequent product adjustment.

Innovation and digitalisation

There are regulatory aspects that are particularly enabling for the design and provision of CDRI products, including those targeted at inclusive insurance segments. These provisions are overarching and not CDRI-specific.

There are flexibilities for innovative product designs. New products are registered based on a 5-day file-and-use system. Insurers are allowed to bundle life and non-life risks, as well as index and indemnity-based products. CDRI products that are designed for inclusive segments in line with defined principles can leverage alternative channels. Insurers may use a variable premium rate scheme for the insured based on alignment with climate risk management commitments, as well as offer discounts on insurance premiums for climate-friendly real estate. New business underwriting policies may also be adapted to allow policyholders to make appropriate adjustments in the transition to proper CCRR management.

There is also a flexible pathway for auxiliary services providers to operate. Law 8653 and the RIAS explicitly mention and allow for the role of auxiliary services providers[lxxiii]. Auxiliary service providers (both local and abroad) are not required to register with SUGESE. However, where the auxiliary services provider is involved in providing a service to the consumer, the insurer must make clear to the consumer who can provide such a service to the insured or beneficiary, clearly state in the contract the conditions to access the services needed and

[lxxii] The only significant difference is that the insurer must also submit the "Self-issued Insurance Analysis", the DERSA, and declaration that the compliance department has checked to ensure that the product complies with the product characteristics specified under the RIAS.
[lxxiii] Under article 18 of Law 8653 - examples mentioned include actuarial services, consulting on risk management, claims processing, accident indemnification, services provided directly as benefits for policy beneficiaries, appraisals, aid services that do not qualify as insurance or reinsurance activity, and loss adjustment. Such providers have played a key role in driving inclusive CDRI globally due to the specialist modelling, technology and processes required.

the means for the policyholder, insured or beneficiary of obtaining updated information on the service.

There is also a supportive overarching environment for digital processes: most of SUGESE's regulatory documents explicitly recognizes and allows for electronic, distance or remote means of communication, whether in interacting with SUGESE or in conducting insurance processes from end to end. The RIAS specifically allows remote means for "promotion and marketing transactions or operations, contracting, acceptance of the proposal by the policyholder and insured, designation of beneficiaries, payment of premiums and benefits, after-sales service, delivery of information and presentation of claims and complaints".

There are no identified restrictions on price or cost control measures on CDRI products, on remote contracting and digital processes, or means of claims payments.

Document	Relevant Features
The Regulations for Inclusion and Access to Insurance (RIAS) (2020)	The RIAS carves out specific product categories (self-issued insurance, which includes inclusive insurance, microinsurance and mass insurance), for which flexibilities in using alternative distribution channels (self-issued insurance intermediaries) and delivery of customer information are allowed. Currently there are 115 inclusive insurance under the RIAS. It specifically acknowledges the use of 'remote means' in the payments, contracting, delivery of information, advice, after-sales service and filing of claims and complaints. It is explicitly stated in Annex 3 of RIAS that it may also include agricultural and livestock insurance. CDRI index insurance can be provided under the RIAS framework.
SUGESE Agreement 01/21 Regulation On Authorizations, Registrations And Operating Requirements Of Entities Supervised By The General Superintendency Of Insurance	The "Additional Risks" section allows the flexibility to bundle different types of risks (both life and non-life).
Legal opinion on parametric insurance SGS-DES-O--04-2019	SUGESE issued a legal opinion clarifying SUGESE's legal perspective on parametric insurance and that it is accepted and regulated as an insurance product.

Best Practice Guide for the Management of Climate Change Related Risks (CCRR) (2023)	This explicitly encourages insurers to develop new CDRI products[lxxiv], providing examples and best practice guidance e.g. index insurance should minimize basis risk, consumer protection principles must be maintained. The CCRR also states that insurers may establish a variable rate scheme for the insured based on compliance with CCRR management commitments, such as investment in eco-efficient technologies and other risk mitigation and reduction measures; as well as offer discounts on insurance premiums for climate-friendly real estate. New business underwriting policies may differ from existing business underwriting policies so that the entity allows policyholders to make appropriate adjustments in the transition to proper CCRR management.

Recommendations

In order to expand the adoption of CDRFI as a DRF tool in Costa Rica, a few recommendations can be considered going forward in the Global Shield process. It should be noted that not all recommendations need to be driven directly by SUGESE. Given SUGESE's resource constraints, it is important to explore if any other stakeholders – INS, insurance associations or other sectoral organizations or public sector – could take the lead.

1. Build industry capacity to design and underwrite CDRFI. This can be achieved not only by training insurers, but also:
    a. Integrating the expertise of specialized companies or foreign insurers or shareholders who have global experience with CDRFI.
    b. Improving the availability of climate risk information that is captured in a manner that is suitable to be used by insurers for underwriting purposes e.g. probabilistic estimates.
2. Building the capacity of the public sector, as well as identified critical aggregators such as associations, agricultural producers or sectoral disaster funds to understand DRF and risk transfer instruments. Such stakeholders can potentially drive demand for group and meso-level approaches to insurance (leveraging the *seguro paritario* set up).
    a. SUGESE may eventually need to act as a technical advisor to public sector stakeholders by supporting them in understanding and articulating their coverage needs to the insurance industry. In the early stages of government capacity to understand insurance, SUGESE may need to act as a "bridge" between government and insurance sector.
3. While SUGESE's role is not to develop insurance products, it is worth considering an informal steer approach. SUGESE could communicate to the industry concretely and objectively what

[lxxiv] Best practice 13. New product development

insurance gaps or needs are most critical (for example, which hazard, geographical area, economic sector, beneficiaries) based on Costa Rica's DRF strategy and risk-layering approach.
    a. This does not have to be a direct SUGESE document but potentially a follow-up to the DRF Strategy by MOF that is then shared by SUGESE with the industry.
    b. Is the geolocation record for fire and allied products a possible starting point for building up data on CDRFI gaps (at least at the household level?).
4. Monitoring the impact of prudential reforms over the next few years will be important to inform SUGESE on companies' readiness to CDRFI. If cost of capital of challenges in meeting capital requirements are an issue, it will likely disincentive companies from offering CDRFI.
5. Explore how to change demand patterns at the household level.
    a. Doing this overnight will be extremely challenging in the short term. Despite the popularity of financial literacy campaigns, experience has shown that it does not always work – especially when the current supply of insurance products is not adequate. Even in disaster-prone regions, building an insurance culture (consider the earthquake insurance risk pool in Turkey) is challenging.
    b. A study on household-level CDRFI needs and challenges accessing CDRFI (assuming it is not only due to awareness and knowledge) may need to be conducted as well as a mapping of the information on existing CDRFI products. This information could then ideally be shared with the industry, in a solution-oriented manner (for example, not all risks are insurable and thus reasonable expectations should be communicated to the industry). In many countries, such a study is led by the association.

Finally, it is important to reflect on the whether and how CDRFI should be prioritized against Costa Rica's overall DRF strategy. Is it the most suitable instrument for the particular problem that needs to be solved, for this particular sector, hazard or geography? And if so, how can it be done in a targeted and effective manner? Should the insurance be done at the sovereign, meso or micro level, given the current demand and supply challenges, or potentially even legal and administrative challenges? These are key factors to consider in prioritizing SUGESE's final request.

Annex 6: Summary of Inclusive Insurance and Insurers Engagement in the In-Country Process (ICP)

This report was prepared by the Microinsurance Network (MiN). Final version: August/September 2024.

Quick Profile of the Country

As Central American nation known for its rich biodiversity and conservation efforts, Costa Rica faces significant vulnerability to disasters caused by natural and extreme weather events. The country is situated between Nicaragua and Panama, bordered by the Caribbean Sea to the north east and the Pacific Ocean to the south west. Although it only represents 0.034% of the earth's surface, it houses approximately 5% of the world's biodiversity which has made it a key ecotourism destination, with more than 26% of its land protected. The country is widely recognised for its environmental conservation initiatives and its progressive sustainability policies, which has allowed it to maintain a positive international image with regard to protecting the environment and biodiversity.

Natural risks are a constant threat in the country due to its geographical location. The zones most susceptible to disasters caused by natural events include the areas prone to volcano eruptions, landslides and floods. The country's coastlines, both on the Caribbean and the Pacific, face threats of cyclones and tropical storms which cause significant damage to coastal communities.

Costa Rica has an annual gross domestic product (GDP) of approximately 86.5 billion dollars and a per capita income of 16,595 dollars, according to the World Bank[lxxv]. Despite Costa Rica's economy having diversified in recent decades, agriculture continues to play a crucial role, representing approximately 13% of employment[lxxvi] and 3.8% of the country's GDP[lxxvii]. Products such as coffee, grown mainly in the central region, contribute significantly to the economy, together with key exportation goods such as bananas, sugar and meat.

The unemployment rate remains high, standing at around 8.3% in 2023, despite the poverty rate being amongst the lowest in the region. The country faces persistent challenges in economic development and equal distribution of wealth, with high inequality reflected in a Gini index of 46.7 in 2023[lxxviii].

According to the Global Risks Report by the World Economic Forum (WEF), the main risks identified for Costa Rica are economic downturn, public debt, erosion of social cohesion, unemployment and extreme weather events. Furthermore, the WEF 2022 highlighted digital inequality as a key risk, as many rural populations are lacking sufficient access to digital technology, restricting their ability to participate in an increasingly digitalised economy.

[lxxv] https://data.worldbank.org/country/costa-rica
[lxxvi] https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?view=map&locations=CR
[lxxvii] https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=CR
[lxxviii] https://data.worldbank.org/indicator/SI.POV.GINI?locations=CR

Despite these challenges that present a double vulnerability, both economic and climatic, Costa Rica has managed to develop an efficient disaster response system, implementing strict construction codes, advanced environmental standards and land use planning that incorporates risk management. Moreover, it has strengthened its institutional and legal framework to integrate disaster risk management into its national development. 77.9% of the population and 80.1% of GDP are in areas at high risk of disasters caused by natural events, which emphasises the importance of improving the country's resilience through protection mechanisms such as inclusive insurance.

The Insurance Market in Costa Rica

The insurance sector in Costa Rica has experienced significant transformation since the market opened in 2008, which brought an end to over 80 years of State monopoly. This change enabled private insurers to enter the market, increasing competition and the diversity of products available.

According to the annual report by the General Superintendency of Insurance of Costa Rica (SUGESE) for the year 2023, the Costa Rican insurance market has 12 active insurers. Total market premiums grew by 5.5% compared to 2022, reaching more than 1.07 trillion Colones. Per capita premium went from ¢195,220 to ¢203,984, an increase of 4.5%, whilst insurance penetration remained stable at around 2.6% of GDP - a figure that shows improvement compared to previous years, but also an untapped opportunity given that the protection gap is estimated to be 2.5 times the size of the current market according to market executives consulted individually for this study.

According to studies conducted by the *Associación de Aseguradoras Privadas* (The Private Insurers Association of Costa Rica), it is estimated that life and health products represent 68% of expansion opportunities in the Costa Rican insurance market. However, the lack of knowledge and understanding regarding insurance in general continues to be a key obstacle for mass adoption of these products. Insurers agree that many people don't see insurance as a priority, especially compared to other urgent needs which limits its penetration into the most vulnerable sectors of the population.

Financial Education and Insurance Initiatives

The lack of financial education is a significant barrier that continues to hinder adoption of insurance in Costa Rica, especially amongst rural and low-income populations. Although both the insurance regulator and companies are making efforts to improve public awareness on the importance of financial protection, many citizens still do not fully understand the benefits that insurance can offer them. This translates into a lack of interest in taking out an insurance policy compared to other more urgent economic needs, such as food and health. Despite there being some individual projects with limited scope, aimed at specific populations, significant large-scale efforts involving private-public partnership focused on insurance education have not been implemented yet. This lack of large, structured initiatives hinders the creation of an insurance culture that fosters financial protection amongst the most vulnerable sectors.

The insurers consulted individually and the private insurers' association highlight that people often do not consider insurance a relevant tool for their economic well-being. This

phenomenon is exacerbated amongst the most vulnerable populations, who often do not see insurance as a necessary investment. Despite this, attempts are being made to collaborate with universities and schools in order to implement educational programmes that raise awareness amongst young people regarding the importance of financial protection – initiatives which could be expanded. However, these efforts have met obstacles, such as disengagement by the educational institutions and limited ability to reach large sections of the populations.

For its part, the National Insurance Institute (INS) has undertaken a broader and more structured approach to financial education, setting itself apart as one of the key actors in this field. The institute has implemented a wide range of prevention and education programmes designed to increase risk awareness and to promote protection through insurance. These programmes are aimed at different demographic groups, with special emphasis on children, adolescents and vulnerable communities. A prime example is the educational programme in schools and colleges that has involved more than 900 educational centres and has impacted more than 45,000 students on the topics of road safety and risk management. Furthermore, the INS has worked closely with other government bodies such as municipalities and the fire department to organise awareness campaigns on accident prevention and safety at home.

Another INS initiative is creating weekly radio shows that, for more than two years, have covered topics concerning financial and personal risk management, thus ensuring massive access to the wide public. These campaigns are supported with talks and workshops on disease prevention, such as breast cancer, where they have even offered free mammograms and ultrasounds in high-risk areas.

The Private Insurers Association of Costa Rica (AAP) has also implemented additional initiatives to improve financial education. One of its most notable contributions is the establishment of a consolidated “Centre for the Defence of the Insured” to support the implementation of the regulation that requires insurers to offer this service. Not only does this centre provide assistance to consumers with regard to their insurance rights, but it also acts as an educational platform that offers answers to frequently asked questions and organises training sessions for insurance companies. Every year, the centre uses the cases received as a base to generate feedback for insurers, helping them to improve their services and clarity in their communication with customers.

In addition, the AAP has collaborated with the General Superintendency of Insurance of Costa Rica (SUGESE) in distributing newsletters and publications aimed at educating the public on the benefits of insurance and its function. Nevertheless, despite these efforts, both the AAP and the INS recognise that insurance penetration remains low, with issues of trust and accessibility continuing to create barriers. With the aim of facing these challenges, and focused on a population and key economic sector of the country, an innovative platform called Futurismo is being developed to educate hospitality workers on the specific risks they face, as well as to offer accessible insurance that allows them to mitigate those risks.

Although multiple efforts have been made to improve financial education and to increase public awareness on insurance in Costa Rica, there still remains much to do to close the protection and knowledge gap, especially in rural areas and amongst the most vulnerable sectors of the population. There is a general willingness to establish public-private alliances that

involve public and private insurers, the association and the insurance regulator. These initiatives could benefit from technical and financial support in order to achieve a greater reach and create a significant impact on a much wider scale, helping to improve accessibility of and trust in insurance as an essential tool for financial protection.

Regulation of Inclusive Insurance and Technological Challenges

In 2020, the Regulation on Inclusion and Access to Insurance was enacted, which marked a turning point in providing a specific regulatory framework for inclusive and self-issuing insurance. The aim of the regulation is to allow insurers to develop more accessible and simplified products that can be marketed without the direct intervention of agents, thus facilitating their distribution through digital channels or local intermediaries. Although the regulation does not explicitly mention parametric insurance, the legal criterion PJD-SGS-004-2019 issued by SUGESE[lxxix] clarifies the viability of its implementation in Costa Rica, noting that it is compatible with the existing legal framework as long as it complies with the principles of transparency and clarity in its terms.

Nevertheless, although the regulation has been a positive development, insurers have stated that is has failed to provide sufficient incentives for transitioning traditional products to the new regulatory environment of inclusive insurance. In many cases, when the products were adjusted to comply with the new regulation, the transition process took up to a year due to the many compliance requirements that needed to be met. This delay not only impacted market agility, but also increased operational costs for insurers, which reduces the scope for offering inclusive and accessible products to vulnerable populations.

Another key aspect is recognising that inclusive insurance requires special attention to be paid to consumer protection, given that it is aimed at a population lacking experience in financial services and, in particular, in insurance. However, this need for protection must be balanced with the simplicity that is essential for the sustainability of micro-insurance products.

Despite the regulatory advances, there are still many areas where flexibility could be improved in order to facilitate adoption of simpler and more accessible products. Reductions in documentation requirements for low-risk products, such as self-issuing insurance, could significantly increase the market penetration of these products. It would also be useful to implement a more specific system of statistical collection on self-issuing insurance to better monitor its impact and subsequently amend regulatory policies.

In this regard, it has been found that many products registered as self-issuing insurance still do not fully meet the simplicity and mass accessibility criteria. In the meetings with the insurance market, it was highlighted that many of these products have policies between 30

[lxxix] Superintendencia General de Seguros. (2019). Dictamen jurídico relacionado con la comercialización de seguros paramétricos: Ley Reguladora del Contrato de Seguros N° 8956. PJD-SGS-004-2019. Disponible en: https://www.sugese.fi.cr/seccion-marco-legal/CriteriosJuridicos/PJD-SGS-004-2019.pdf

and 54 pages long that have complex wording which makes it difficult to understand for the average consumer, especially in areas that are rural and have low literacy levels. This complexity has been flagged as a key obstacle preventing the inclusive products achieving their true purpose of reaching the most vulnerable populations.

A specific challenge associated with the Standardised Summary of Self-Issuing Insurance (DERSA) is the administrative burden that is imposed on insurers. Whilst this document aims to standardise key information and make it more understandable to consumers, insurers have reported that this requirement has increased their operational costs, affecting final delivery to the consumer.

Furthermore, one of the big regulatory and technological challenges identified is the implementation of parametric insurance, which is particularly relevant for mitigating climate-related risks in Costa Rica, a country that is highly vulnerable to phenomena such as floods, storms and earthquakes. Although the INS recorded the country's first parametric insurance in 2022, this product, focused on the coffee-growing sector, has not been implemented yet due to the lack of adoption by customers. Other types of parametric insurance that are being considered for market implementation include coverage for floods, power outages for SMEs, red tide for fishermen, business continuity in tourist areas, and regenerative coffee.

In the sectorial interviews, it was reported that one of the main challenges is not so much the regulation in itself, but access to suitable technological and actuarial data for developing precise models. Lack of experience in implementing these products has made Costa Rican insurers rely on external assistance to advance in this field. Further, the key role that the government could play, not only as a facilitator, but also as a potential sponsor of these products, especially in vulnerable sectors where natural disasters generate a high dependence on public resources for recovery has been highlighted.

On the other hand, the operational requirements that complicate taking out self-issuing insurance policies and hinder clear understanding of the product due to excessive documentation can be particularly counter-productive in the case of parametric insurance, where the inherent complexity adds to the need to understand how the index works. Enabling insurers to innovate in both the sale process and consumer communication, while at the same time clearly demonstrating to the insurance supervisor how customer protection is secured, could strengthen the market, including for products that protect against climate events.

The need for intersectoral collaboration and the support of countries or entities with more experience in implementing parametric insurance has been identified. Insurers have expressed interest in receiving technical support in order to improve their data collecting abilities, the use of satellite technology and actuarial modelling, which are essential for the success of these products. In this regard, Global Shield could play a crucial role by facilitating these alliances, offering financial and technical support with which Costa Rican insurers can develop and implement more efficient parametric policies.

Tax Barriers

Tax barriers represent a key structural challenge for the growth of inclusive insurance in Costa Rica, affecting both the range of products and accessibility for low-income consumers. Currently, life and health insurance products are subject to a reduced VAT rate of 2%, which

gives them a slight competitive advantage over other types of insurance. However, other critical inclusive insurance components, such as sales commissions and reinsurance, are taxed with a VAT of 13%. This tax considerably reduces profitability for insurers, in particular for micro-insurance products which work with much tighter margins. Furthermore, this situation is exacerbated by an inherent tax inefficiency of 11%, which increases costs for insurers even more and reduces their ability to offer accessible products to vulnerable populations.

The potential increase of VAT on reinsurance to 15% is seen as an additional threat which would put even greater pressure on insurers, increasing the costs of these products and limiting their supply. This possible tax increase would be a significant obstacle for the expansion of the inclusive insurance market, particularly affecting products designed for the most vulnerable sectors that are already facing barriers to access insurance.

Another major fiscal hurdle is the parafiscal 4% charge on insurance premiums intended to fund Costa Rica's fire department. Whilst it has contributed towards improving the institution's infrastructure, it has also increased insurance costs, affecting products aimed at low-income sectors in particular. Insurers have expressed concern at how this tax impacts the economic viability of basic products, such as self-issuing life or health insurance, which are essential for protecting the country's most unattended sectors.

Both private insurers and other market players have stressed the need to introduce specific tax exemptions for microinsurance and inclusive products. Without these exemptions, it will be difficult to close the protection gap, given that current costs restrict both the product range and demand from the most vulnerable communities. Furthermore, taxes on premiums and the administrative complexity that comes with their management continue to act as barriers, obstructing growth of insurance in rural areas and amongst people with less access to the financial system.

Public-Private Partnership and Opportunities for Global Shield

Collaboration between the public and private sectors is crucial for addressing the gaps in insurance cover in Costa Rica. The insurers consulted stressed the importance of working with the government on the development of products that not only protect people, but also public infrastructure, against natural events.

In this regard, the Global Shield initiative could play a crucial role in encouraging the creation of innovative products, such as parametric insurance, that cover specific risks such as floods and storms.

However, implementing parametric insurance presents significant challenges, particularly in terms of technological and actuarial barriers that require greater technical knowledge and accurate data. Insurers have reported that external support from sectors or countries with more experience in these types of products would be key to overcoming these obstacles and developing more effective solutions.

In addition to developing products, there is great potential in the educational initiatives on insurance, especially those geared towards rural and vulnerable communities. Global Shield could support projects that promote awareness and training on insurance on a large scale,

thus bridging the gap in knowledge that hinders the adoption of essential financial products. Implementation of integrated educational programmes in education systems or in partnerships with institutions such as universities and schools, as well as in key sectors such as hospitality industry, could bring about substantial change in understanding the value of insurance.

Another essential component could be improving the regulatory environment, facilitating the adoption of simple and accessible products. It is important to analyse the different modalities (inclusive insurance, microinsurance, mass insurance) in order to evaluate opportunities for expanding the notion of inclusive insurance beyond self-issuing insurance. A comprehensive review of the regulatory framework, which not only envisages the regulation of inclusive insurance but also obstacles for the implementation of parametric insurance, potentially through ex post impact evaluations using the methodology already deployed by A2ii in other countries (Peru, the Philippines and Brazil), would enable bureaucratic barriers to be reduced and flexibility in the range of inclusive products to be increased, promoting greater insurance penetration in the most unattended sectors. In addition, specific tax exemptions for inclusive insurance and simplification of procedures could make these products more attractive to both insurers and consumers. Not only would this comprehensive partnership, led by Global Shield, better protect people and their property, but it would also foster a stronger insurance culture throughout the country.

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Annex 7: Results of validation of identified gaps and prioritisation of sectors

Based on the outcomes of the Second Global Shield - SUGESE Workshop in Costa Rica

On 31 October 2024, the second workshop with the country's key stakeholders took place. The aims of this workshop were to present the preliminary results of the financial protection gap analysis, obtain feedback on these results and identify priority focus areas.

In the various round tables, participants discussed the gaps identified and prioritised the sectors into which potential support from Global Shield could be channelled to reduce these gaps. The discussions were organised according to the four categories of gaps established in this report. The main results are presented below.

Prioritisation of sectors in the different gap categories

The three sectors identified as the most vulnerable in the country, based on their exposure and vulnerability to climate and disaster risk, were presented. Participants were asked to prioritise them and suggest others, where applicable. Table 8 shows the results.

Table 8: Sectors prioritised in the round tables discussions

Priority/Gap Category	Policies and Strategies	Enabling Environment	Risk analysis and modelling	CDRFI Instruments
1	Infrastructure	Infrastructure	Natural Capital	Agriculture
2	Agriculture/Fishing/Aquaculture	Agriculture/Fishing	Tourism	Tourism
S	Ecosystem Services	Tourism	Agriculture/Fishing	Sustainable and Resilient Infrastructure
4	Tourism		Infrastructure	

Participants stressed the importance of including natural capital and ecosystem services among the priorities

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Discussion and prioritisation of gaps

The gaps preliminarily identified were also discussed and prioritised during the round tables. Table 9 shows the results.

Table 9: Prioritisation of gaps

Priority	Policies and Strategies	Priority	Enabling Environment
1	Opportunities for improvement in governance of existing plans and strategies	1	Designing products with financial support for accessing insurance.
2	The need to achieve tangible results, particularly for the most vulnerable sectors.	2	Regulatory adjustments to promote inclusive insurance.
3	The need to strengthen the culture and technical capacities for modelling and managing risks within public and private institutes.	3	Generation of a process for the creation and implementation of sovereign parametric insurance with comprehensive support.
		4	Financial education (supply): with a special emphasis within public and private institutions (decision makers)

Priority	Risk analysis and modelling	Priority	CDRFI Instruments
1	Standardisation of an analysis methodology and risk modelling for the country (platform)	1	Insufficiency and sustainability of the National Emergency Fund
2	Developing new risk estimates to define specific hazards and sectors (e.g., droughts, natural capital)	2	Developing insurance for vulnerable populations
		3	Developing strategic insurance for the protection of natural assets
		4	Developing national parametric insurance (sovereign)

These results served as the foundation for the Executive Committee to prioritise the sectors and gaps that will preliminarily be included in the request for support to Global Shield.

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