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Dominican Republic

National Disaster Preparedness Baseline Assessment
Final Report

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The Pacific Disaster Center and the authors of this report would like to acknowledge the partnership and many insightful inputs and guidance provided by representatives of the various agencies and organizations that participated in the Dominican Republic NDPBA workshops, surveys, interviews, and data validation and analysis process including:

- Agencia Española de Cooperación Internacional para el Desarrollo
- Autoridad Portuaria Dominicana
- Ayuntamiento del Distrito Nacional
- Banco Central de la República Dominicana
- PMR Comité Provincial de Barahona
- PMR Comité Provincial de San Pedro de Macorís
- PMR Comité Provincial de Santiago
- Centro de Operaciones de Emergencia
- Centro Nacional de Sismología, Universidad Autónoma de Santo Domingo
- Comisión Nacional de Emergencias
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- El Instituto Geográfico y Geológico, Universidad Autónoma de Santo Domingo
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- Instituto Cartográfico Militar
- Instituto Dominicano de Aviación Civil
- Instituto Nacional de Aguas Potables y Alcantarillados
- Instituto Nacional de Recursos Hidráulicos
- Liga Municipal Dominicana
- Ministerio de Agricultura
- Ministerio de Defensa

- Ministerio de Economía, Planificación y Desarrollo
- Ministerio de Educación
- Ministerio de Interior y Policía
- Ministerio de Medio Ambiente y Recursos Naturales
- Ministerio de Obras Públicas y Comunicaciones
- Ministerio de Salud Pública y Asistencia Social
- Oficina Nacional de Estadística
- Oficina Nacional de Meteorología
- Oxfam
- Plan de Asistencia Social de la Presidencia
- Plan International
- Policía Nacional
- Servicio de Atención a Emergencias-911
- Servicio Geológico Nacional
- Sistema Único de Beneficiarios
- United Nations Development Program
- United Nations Office for the Coordination of Humanitarian Affairs
- United Nations World Food Programme
- United States Embassy

Acronyms

CC	Coping Capacity
CDM	Comprehensive Disaster Management
DM	Disaster Management
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EOC	Emergency Operations Center
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Reduction and Recovery
IDB	Inter-American Development Bank
IFRC	International Federation of the Red Cross and Red Crescent
INGO	International Non-Governmental Organization
MHE	Multi-Hazard Exposure
MHR	Multi-Hazard Risk
MOU	Memorandum of Understanding
NDMO	National Disaster Management Organization
NDPBA	National Disaster Preparedness Baseline Assessment
NEOC	National Emergency Operations Center
NGO	Non-governmental Organization
PDC	Pacific Disaster Center
SAR	Search and Rescue
SOP	Standard Operating Procedure
UN	United Nations
UNICEF	United Nations Children's Fund
USD	United States dollars
USGS	United States Geological Survey
V	Vulnerability
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

Executive Summary

This report details the final results of the National Disaster Preparedness Baseline Assessment (NDPBA) Project conducted in coordination with, and in support of, stakeholders in the Dominican Republic. The goal of this project was to assess disaster risk at the subnational level and place it in the context of disaster risk-reduction (DRR) efforts currently underway in the Dominican Republic. The NDPBA provides a baseline for evidence-based DRR decision making, while simultaneously supporting the enhancement of data holdings to establish future trends in the drivers of disaster risk.

The NDPBA project provides a repeatable and measurable approach to examining key elements of DRR. The NDPBA approach consists of distinct yet complimentary activities, including:

- Focused stakeholder engagements;
- A detailed subnational risk and vulnerability assessment (RVA) that included the following elements: multi-hazard exposure, vulnerability, coping capacity, lack of resilience, and multi-hazard risk;
- A review of national and subnational comprehensive disaster management (CDM) capabilities to identify challenges and provide recommendations for strengthening preparedness and response;
- A proposed five-year plan, including recommendations to build capacity and capability; and
- Data integration and information sharing.

The data and final analysis provided in this report are integrated into the Pacific Disaster Center's (PDC) decision-support system known as DisasterAWARE™, allowing for open and free access to critical DRR data and information. Access to the system may be requested through ndpba@pdc.org.

Findings

Risk and Vulnerability Asssement

The population of the Dominican Republic experiences very high levels of exposure to seismic activity and tropical cyclone winds. Volcanic hazards also pose a significant threat, while smaller proportions of the population are also exposed to landslides, inland floods, and tsunami hazard zones. See **Error! Reference source not found.** for total population exposure to hazards in the Dominican Republic.

Table 1. Population exposure to hazards in the Dominican Republic

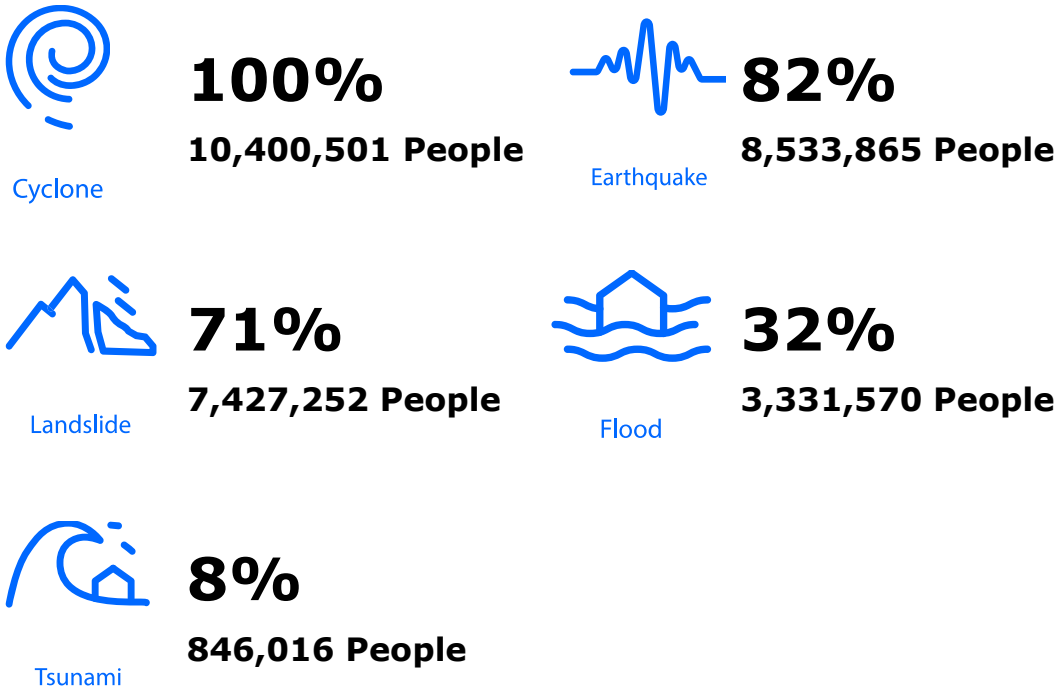


Table 2 provides a summary of the component results for Multi-Hazard Risk (MHR), Multi-Hazard Exposure (MHE), Vulnerability (V), Coping Capacity (CC), including index scores, and relative ranking among the 32 provinces. A rank of 1 corresponds to a high score (e.g., high multi-hazard risk), while a rank of 32 indicates a low score (e.g., low multi-hazard risk).

Table 2. Dominican Republic Multi-Hazard Risk (MHR) Index scores, rankings and component indices, by province.

Province	Multi-Hazard Risk		Multi-Hazard Exposure		Vulnerability		Coping Capacity		Province Risk Level
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	
Duarte	0.588	1	0.792	4	0.395	22	0.422	24	Very High
El Seibo	0.584	2	0.458	22	0.601	5	0.305	31	Very High
Monte Plata	0.567	3	0.569	16	0.497	10	0.365	29	Very High
Baoruco	0.563	4	0.382	24	0.655	1	0.349	30	Very High
Espaillat	0.561	5	0.779	5	0.356	24	0.451	20	Very High
Monte Cristi	0.558	6	0.584	15	0.565	7	0.475	14	Very High
María Trinidad Sánchez	0.555	7	0.691	11	0.398	20	0.423	23	Very High
Santo Domingo	0.538	8	0.829	2	0.328	28	0.544	6	High
Hermanas Mirabal	0.538	9	0.707	8	0.392	23	0.486	11	High
Valverde	0.536	10	0.682	12	0.482	12	0.556	4	High
La Altagracia	0.532	11	0.568	17	0.542	8	0.515	9	High
Independencia	0.531	12	0.356	27	0.635	2	0.399	27	High
Sánchez Ramírez	0.530	13	0.588	14	0.403	19	0.401	26	High
Santiago	0.528	14	0.93	1	0.261	31	0.606	2	High
La Vega	0.525	15	0.725	7	0.398	21	0.547	5	Medium
Hato Mayor	0.525	16	0.539	19	0.496	11	0.461	19	Medium
San Pedro de Macorís	0.519	17	0.691	10	0.351	26	0.485	12	Medium
Puerto Plata	0.516	18	0.815	3	0.311	30	0.579	3	Medium
San Juan	0.515	19	0.372	25	0.54	9	0.367	28	Medium
Samaná	0.507	20	0.540	18	0.446	16	0.463	16	Medium
Monseñor Nouel	0.504	21	0.701	9	0.320	29	0.508	10	Low
La Romana	0.497	22	0.608	13	0.412	18	0.528	8	Low
Peravia	0.490	23	0.459	21	0.473	14	0.462	18	Low
Elías Piña	0.490	24	0.105	32	0.606	4	0.242	32	Low
Azua	0.473	25	0.370	26	0.585	6	0.536	7	Low
Barahona	0.472	26	0.393	23	0.458	15	0.435	21	Low
Dajabón	0.457	27	0.355	29	0.440	17	0.424	22	Very Low
San Cristóbal	0.451	28	0.478	20	0.338	27	0.463	17	Very Low
Pedernales	0.440	29	0.109	31	0.631	3	0.419	25	Very Low
Distrito Nacional	0.426	30	0.764	6	0.153	32	0.639	1	Very Low
Santiago Rodríguez	0.411	31	0.355	28	0.353	25	0.475	13	Very Low
San José de Ocoa	0.393	32	0.172	30	0.476	13	0.470	15	Very Low

RVA Recommendation

01 Strengthen Data Standards and Sharing

A. Ensure that hazards and vulnerability data are consistently defined, documented, updated, and applied in disaster management and disaster risk reduction.
B. Implement strategies to strengthen data sharing and transparency between all organizations active in disaster management to support evidence-based decision making.

Effort:

Complexity: Medium

Cost: $

02 Develop and Strengthen Multi-stakeholder Partnerships

A. Increase the capacity to conduct and update high-resolution hazard assessments with national coverage by developing partnerships with non-traditional stakeholders.
B. Strengthen strategic multi-stakeholder partnerships to expand disaster risk reduction resources to include non-traditional disaster management partners.

Effort:

Complexity: Low

Cost: $

03 Improve Documentation of Subnational Economic Resources

Provide a more comprehensive understanding of economic capacity (ex. GDP, income, expenditures, remittances) at the province and local levels. Resource documentation allows stakeholders to immediately identify when capacities are exceeded.

Effort:

Complexity: High

Cost: $$

Comprehensive Disaster Management Assessment

The Dominican Republic has a strong national disaster management system. The greatest strength of the system is the culture of volunteerism that has allowed CNE and Defensa Civil to develop a strong system with minimum resourcing. Other strengths of the system include: the establishment of the National Risk Management School and an inclusive training program; regularly conducting national level exercises; the country's legal framework (Ley 147-02); highly integrated disaster preparedness and response plans at the national level; and the involvement of NGOs in the disaster management system.

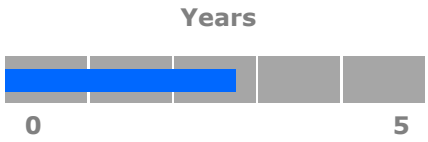
Although the Dominican Republic has a strong disaster management system, the assessment process has identified a number of challenges. The challenges identified will limit the ability of the Dominican Republic to most effectively prepare for and respond to disasters.

Key challenges for the disaster management system include: adequate facilities, especially a lack of space in the National EOC during large disasters; minimum training standards have not been established for disaster management personnel; lack of capacity and resources at the provincial and municipal levels; the limited availability of response plans at the subnational level; and private sector engagement at the subnational level. These challenges were validated over the course of the project through interviews and site visits with stakeholders at national, provincial and municipal levels, demonstrating an awareness on the part of The Dominican Republic's disaster management stakeholders of the issues they face.

Figure 1. Responses for Question 19 of Survey III: "In your opinion, what is the greatest challenge to effective disaster response?"

CDM Recommendations

Table 3. Evaluation Criteria for CDM Recommendations

Recommendations Evaluation Criteria		
Effort		Estimated length of time (in years) to complete the project once it is started.
Complexity	**Low** **Medium** **High**	Overall complexity based on the estimated staff time, resources, and collaboration required to complete the project.
Cost	**$$$**	Estimated annual cost of the project, not including salaries, based on a percentage of the current NDMO annual budget. $ approximates less than 1% of the annual operating budget. $$ approximates between 1% to 10% of annual operating budget. $$$ approximates more than 10% of the annual operating budget.

01

Establish training requirements

Establish minimum training requirements for disaster management staff at all administrative levels (Impact: Moderate).

Methodology / Resources. Training requirements could include: basic knowledge of laws and regulations; the disaster management system; basic and advanced EOC operations; information management; basic and advanced disaster management. Sources for training courses include the IFRC, Salvation Army, USAID/OFDA, US Federal Emergency Management Agency, regional organizations such as ASEAN, and many national disaster management offices.

Effort:

Complexity: Simple

Cost: $

02

Conduct full-scale exercises

Work with partners to develop resourcing and conduct periodic national full-scale exercises to test the capabilities of the COE staff (Impact: Significant).

Methodology / Resources. Due to the resources and staff support required to plan for and execute full-scale exercises (FSEs), PDC recommends that FSEs occur only once every 3 or 4 years. It is further recommended that a national exercise program be implemented that includes a cycle of tabletop exercises (TTXs), functional exercises (FEs) and full-scale exercises, ensuring that basic skills are established and built upon each year of the cycle. Organizations that have developed cyclical exercise programs include the Hawaii Emergency Management Agency and the US Federal Emergency Management Agency. Assistance with developing national exercise programs can be requested through UNOCHA and USAID.

Effort:

Complexity: Complex

Cost: $$

03

Conduct inter-institutional drills

Develop and implement a plan to conduct inter-institutional drills in accordance with requirements in the *Plan Nacional de Gestión de Riesgos* (Impact: Moderate).

Methodology / Resources. Establish a schedule of inter-institutional drills that engages each ministry at least once every 3 years, and requires the participation of two or more ministries or institutions.

Effort:

Complexity: Complex

Cost: **$$**

04

Increase resourcing at national, provincial and municipal levels

Work with partners to develop alternative methods to increase resources at the national, provincial, and municipal levels (Impact: Significant).

Methodology / Resources. Alternative methods could include: developing a program to identify and use college interns; and developing grant proposals for foreign government or International Non-Government Organizations (INGO) funding.

Effort:

Complexity: Complex

Cost: **$$$**

05

Increase resourcing to the *Fondo Nacional*

Work with national and international partners to identify alternative sources to increase appropriations to the Fondo Nacional de Prevención, Mitigación y Respuesta ante Desastres to the point that it can cover all disaster expenses incurred each year based on a 20-year disaster loss average (Impact: Moderate).

Methodology / Resources. Alternative sources are being explored through legislation to include licensing fees for gas stations and INGO fees. Other sources could include: adding a tax to each property insurance policy issued; additional fees for development / building permits in higher-risk areas; and increasing the tourist visa fee, earmarking the proceeds for the Fondo Nacional. COPECO in Honduras could provide insight into additional sources of revenue.

Effort:

Complexity: Complex

Cost: **$$$**

06

Explore risk transfer mechanisms

Explore and consider implementing or joining a risk transfer mechanism such as insurance, catastrophe bond or contingent credit facility (Impact: Moderate).

Methodology / Resources. Assistance with implementing risk transfer mechanisms can be provided by the IDB, the World Bank, and the International Monetary Fund.

Effort:

Complexity: Medium

Cost: **$$$**

07

Community response organizations

Determine the need for formal community response organizations and, if needed, add the requirement to *Ley 147-02* (Impact: Significant).

Methodology / Resources. Conduct a review of the disaster management system and the role of the local PMR committee to determine if there are gaps in needed capabilities. If gaps are identified, develop a plan to create legislation and identify needed resources.

Effort:

Complexity: Medium

Cost: $

08

Socialize *Ley 147-02*

Develop a program to provide training to the mayors and local community representatives on the requirements of *Ley 147-02*, and follow up with assistance visits to ensure they are meeting the requirements of the law (Impact: Moderate).

Methodology / Resources. Develop and deliver a training course on the requirements of Ley 147-02 to all mayors and local community representatives. Conduct visits to each municipality to identify shortfalls against the requirements. Develop and implement a strategy to meet the shortfalls in each municipality.

Effort:

Complexity: Simple

Cost: $

09

Ministry disaster plans

Identify ministries without disaster plans and establish a strategy to assist them with completing required plans (Impact: Minor).

Methodology / Resources. Develop a plan to review all ministry disaster plans, identify those without plans or with outdated or insufficient plans, and provide support to complete the required plans.

Effort:

Complexity: Simple

Cost: $

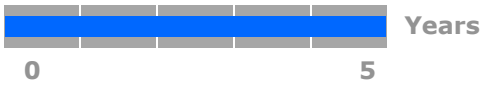
10

Complete recovery plans

Identify organizations that have not developed recovery plans and work with partners and the international community to complete recovery plans (Impact: Significant).

Methodology / Resources. Develop a program to train ministries, provinces and municipalities on recovery planning and implement the recovery planning process. UNISDR's Guidance Note on Pre-Disaster Recovery Planning and PDC/ASEAN's Disaster Recovery Training Course could provide a foundation for successfully developing recovery plans.

Effort:



Complexity: Complex

Cost: $$

11

Province and municipal disaster plans

Identify provinces and municipalities without disaster plans and work with partners and the international community to identify resources to assist with completing required plans (Impact: Moderate).

Methodology / Resources. Develop a program to identify the provinces and municipalities without disaster plans, identify the resources needed to develop the missing disaster plans, and assist with completing them in accordance with the guidelines established by CNE and Defensa Civil.

Effort:

Complexity: Medium

Cost: **$$**

12

Plan and SOP update requirements

Develop and promulgate minimum requirements for updating plans and SOPs. (Impact: Minor)

Methodology / Resources. Recommended intervals: review and update plans after each major disaster or at least every five years; review and update SOPs at the beginning of each hurricane season.

Effort:

Complexity: Simple

Cost: **$**

13 Encourage private sector engagement

Strengthen *Ley 147-02* to encourage engagement with private sector organizations at the national, provincial, municipal and community levels and include the private sector in all phases of disaster management (Impact: Significant).

Methodology / Resources. Encourage participation in the PMRs at all levels through representation by trade groups such as the Chamber of Commerce or other appropriate organizations. Develop a program to open a dialogue between government and private sector trade groups to determine: what the private sector needs from government; what government needs from the private sector; what each can provide the other; and design a strategy to implement the findings.

Effort:

Complexity: Complex

Cost: $

14 Increase capacity at the provincial, municipal and local levels

Work with private sector and NGO partners to increase capacity at the provincial, municipal and local levels to conduct all disaster management responsibilities (Impact: Significant).

Methodology / Resources. Programs to increase capacity could include: leveraging collaborative relationships to provide additional opportunities for training and exercise participation; adopting standardized training requirements; and providing programs that strengthen local disaster management response capabilities, including community resilience building, developing and rehearsing plans, and response-operations management training. One example of community resilience building is the State of Hawaii's Hawaii Hazards Awareness and Resilience Program (HHARP) available through PDC.

Effort:

Complexity: Complex

Cost: $$

15

Enhance municipal and community empowerment

Work with partners to enhance municipal and community empowerment (Impact: Significant).

Methodology / Resources. Empowerment could come through preparedness activities such as: developing local response plans; strengthening community partnerships; providing preparedness and response training activities; and community hazard mapping.

Effort:

Complexity: Complex

Cost: $$

16

Resource lists

Require ministries to develop and update lists of resources available for emergency operations and develop a central repository for the list at the COE (Impact: Minor).

Methodology / Resources. Review resource list submissions for all ministries and determine those that have not provided information or have provided inadequate information. Train ministry personnel on resource list requirements. Provide a list of ministries that have not provided resource lists to the President of CNE.

Effort:

Complexity: Simple

Cost: $

17

Purpose-built COE

Plan, construct and provide the necessary equipment for a stand-alone, purpose-built Emergency Operations Center (EOC) that can house all functions needed to respond to a large-scale national disaster (Impact: Significant).

Methodology / Resources. Review operational requirements and design, build and furnish a purpose-built national EOC.

Effort:

Complexity: Complex

Cost: **$$$**

18

Prioritize *salas* based on MHE and provide facilities

Prioritize regional and provincial *salas* based on overall multi-hazard exposure from the RVA and work with international partners to provide stand-alone facilities, equipment, and supplies to the top three at-risk provinces (Impact: Significant).

Methodology / Resources. Provide logistical and administrative areas (including an EOC) to the provinces that are most at-risk according to the findings of the RVA.

Effort:

Complexity: Medium

Cost: **$$$**

Contents

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Project Overview

National Disaster Preparedness Baseline Assessment
Final Report

Project Overview

This report summarizes the results of the National Disaster Preparedness Baseline Assessment (NDPBA) project conducted by the Pacific Disaster Center (PDC) in partnership with, and in support of the Dominican Republic.

The objective of the NDPBA was to identify the conditions within the country that assess its preparedness for and capabilities in effectively responding to and recovering from disasters. Designed to provide a comprehensive understanding of the Dominican Republic's risk and disaster management capabilities, the findings support evidence-based decision making to enhance disaster risk reduction (DRR) through focused capacity and capability building. Using a stakeholder-driven approach, the NDPBA project facilitated the integration of national DRR goals into the Risk and Vulnerability Assessment (RVA) and Comprehensive Disaster Management (CDM) methodologies.

The goal of the project was to enhance disaster resilience within the Dominican Republic by:

Strengthening Governance
Provides necessary justification to support policy decisions that will protect lives and reduce losses resulting from disasters.

Prioritizing Budgets and Investments
Helps decision makers identify, assess, and prioritize investments that will have the greatest impact on disaster risk reduction.

Informing Decision Making
Provides access to spatial and temporal information by multiple stakeholders, including multi-hazard exposure, impact, and risk information all in one place.

Encouraging Cooperation
Brings international, national, and local stakeholders together to discuss country goals, capacities, needs, and successes to help shape priorities.

Identifying Actions to Increase Resilience
Helps stakeholders develop a five-year action plan to achieve risk-reduction goals and enhance disaster mitigation, preparedness, response, and recovery.

Allowing Risk Monitoring and Data Management
Multiple agencies can easily update data and monitor how risk and vulnerability changes over time at the national and subnational level.

The NDPBA project provides a repeatable and measurable approach to examining key elements of disaster risk reduction (DRR). The NDPBA approach consists of distinct yet complimentary activities, including:

- Focused stakeholder engagements;
- A detailed subnational RVA that includes the following elements: multi-hazard exposure, vulnerability, coping capacity, lack of resilience, and multi-hazard risk;
- A review of national and subnational CDM capabilities to identify challenges and provide recommendations for strengthening preparedness and response;
- Data integration and information sharing; and
- A proposed five-year plan, including recommendations to build capacity and capability.

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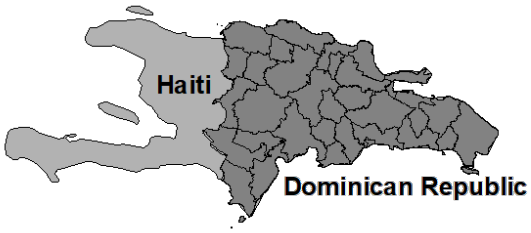
Country Background



The Dominican Republic comprises the eastern two-thirds of the Caribbean island of Hispaniola, with the western third of the island belonging to Haiti. Situated in both the Caribbean Sea and the North Atlantic Ocean, the Dominican Republic is the second largest country in the region in terms of landmass, falling just below Cuba. It has an area of 48,670 square kilometers (~ 18,792 square miles), including 1,288 kilometers (~800 miles) of coastline.

The Dominican Republic is one of the most geographically diverse countries in the Caribbean and is divided into three macro-zones: Cibao (North), Sur (Southwest), and Este (Southeast). With a tropical maritime climate, there is little seasonal temperature variation. Temperatures across the island are high, with the coastal areas typically experiencing hotter weather than the central regions. There is extreme variation in rainfall throughout the country's two rainy seasons which coincide with the hurricane season. The heavier rainy season runs from May to August, while the second rainy season falls between November and December. Mountains and valleys make up the vast majority of the country.

For administrative purposes, the Dominican Republic is divided into thirty-two provinces including the National District of Santo Domingo. Provinces are subdivided into municipalities, and furthermore into municipal districts.

Nearly half of the Dominican Republic's population resides in rural areas, although urbanization has been steadily increasing since the middle of the twentieth century. At present, the country has a population of 10,169,172[1] with a population density of 215 people per square kilometer as of 2014[2]. The capital city of Santo Domingo hosts one-fifth of the country's population, with 2.4 million people within the city limits as of 2012.

[1] Oficina Nacional de Estadisticas, 2017
[2] World Bank, 2015

Primary industries for the country include mining; textiles, tourism, cattle ranching and farming of tobacco, sugarcane, coffee, cotton, and cacao. As a middle-income country, it has had one of the fastest growing economies in the Latin American and Caribbean Region over the last two decades. However, the poverty rate remains high, hovering somewhere near forty percent of the population (World Bank, 2015).

The Dominican Republic ranks 102 out of 187 countries on the 2014 Human Development Index (GEOHIVE, 2015). According to the IFRC, the Dominican Republic is the second most vulnerable country in the Caribbean after Haiti (IFRC, 2011). As the country is located within the Hurricane Belt, it is highly susceptible to hurricanes and tropical storms between the months of June and November. During hurricane season, landslides and flash flooding as a result of heavy inundation are a major concern. The country faces additional risks from wildfire, drought, seismic events and tsunamis.

In recent years, the Dominican Republic has instituted a progressive array of disaster risk reduction legislation across all levels of government. In 2002, the Dominican Republic signed Law No. 147-02 into legislation as the country's Disaster Risk Management Act. Designed to focus on prevention, mitigation, and response, the Act encourages community engagement in DRR at all levels, from the national to the local sphere.

Comision Nacional de Emergencia (CNE) is the coordination mechanism responsible for executing DRR/DRM policies and decisions. Developed in 2001, CNE includes representatives from across civil society. The operational arm of CNE is Defensa Civil, which also maintains the Emergency Operations Center (COE). The COE holds responsibility for the monitoring of potential hazards and ensuring a coordinated response to natural and man-made disasters throughout the country at the national level.

Sub-national disaster management is coordinated by Prevention, Mitigation and Response (PMR) Committees which are headed by local authorities – governors/mayors – and incorporate Civil Defense and Presidents of local Dominican Red Cross branches.

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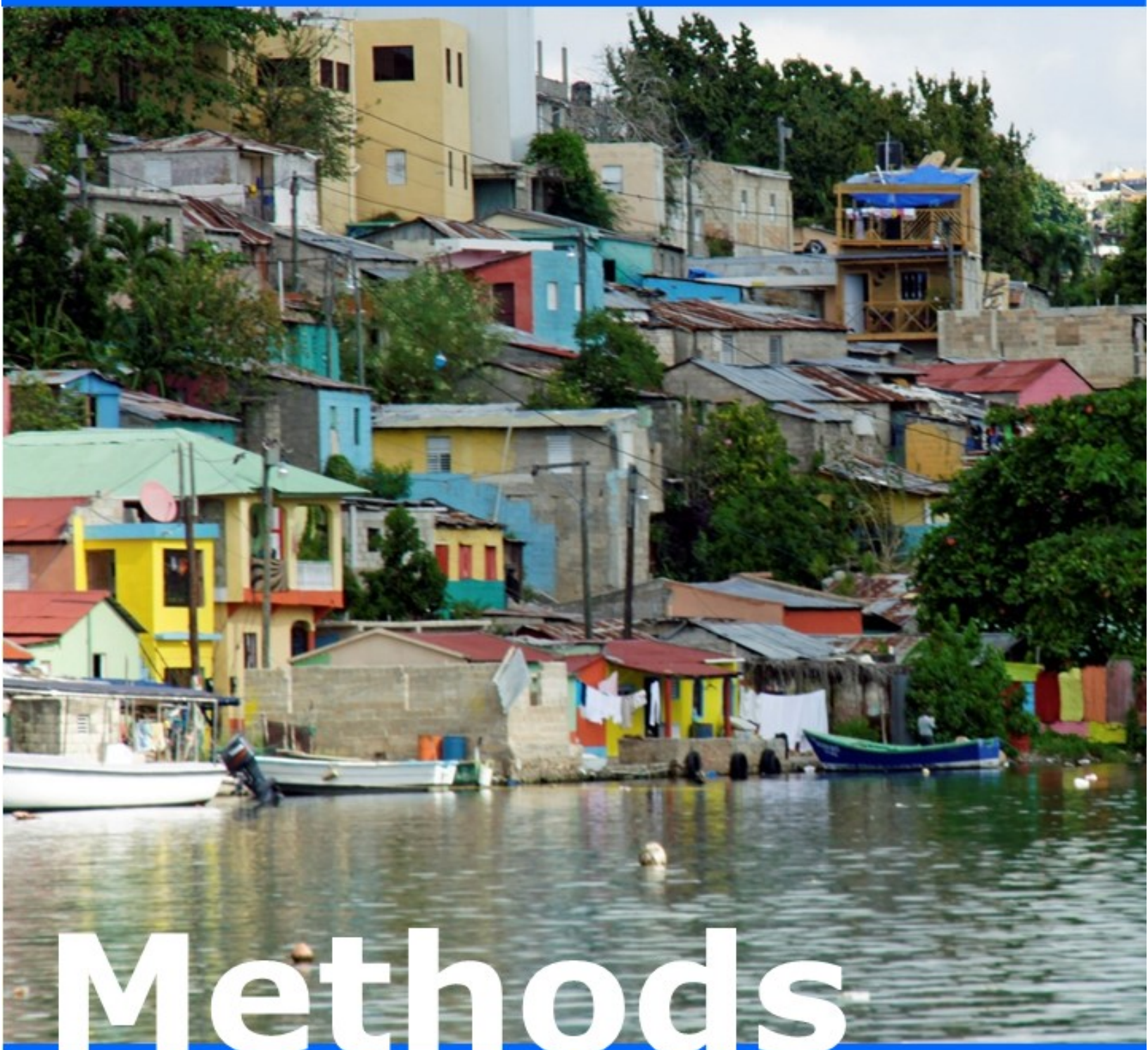

Methods

National Disaster Preparedness Baseline Assessment
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Methods

This section of the report summarizes the NDPBA methodology implemented in the Dominican Republic, to include stakeholder engagement, risk and vulnerability assessment, comprehensive disaster management assessment, and data gathering, processing, and analysis.

Facilitated Knowledge Exchanges

Facilitated stakeholder engagements acknowledge the Guiding Principles of the Sendai Framework for Disaster Risk Reduction and were fundamental components of the NDBPA. Over the duration of the project, stakeholders in the Dominican Republic were invited to attend three Knowledge Exchanges (*Initial, Midterm, and Final*), as well as participate in data reviews, interviews, and standardized surveys. Knowledge Exchanges provided opportunities for stakeholders to present on disaster management topics of interest and highlight the important work each organization has undertaken in support of DRR. Leveraging a participatory approach, a diverse group of traditional and non-traditional disaster management stakeholders were engaged. This approach encouraged active participation and promoted diversity among participants and partners.

Prior to the Knowledge Exchanges, in-depth archival research was conducted to gain insight into the national disaster management system and identify disaster management stakeholders who were subsequently invited to the Initial Knowledge Exchange. Presentations provided by the project team and by in-country stakeholders during this event and two subsequent Knowledge Exchanges provided opportunities to discuss the NDPBA methodology, explore available data sources and gaps, administer surveys, discuss challenges and successes, and review preliminary assessment results. Following the exchange, meetings with stakeholders were scheduled to conduct detailed interviews and share data and information. Additional stakeholder engagements provided opportunities to share data, conduct interviews, provide training on PDC's DisasterAWARE™ decision-support system, and exchange professional insights, experience, and best practices.

This participatory approach was coordinated with national disaster management leadership and personnel at national and subnational levels. The project team collaborated with a broad range of project stakeholders that make up the National Commission of Emergencies (Comisión Nacional de Emergencias, CNE) including Civil Defense, Ministry of Health, Ministry of Environment and Natural Resources, Ministry of Education, and others, including national and international NGOs. A full list of participating agencies and organizations is included in the **Acknowledgements** section of this report.

Risk and Vulnerability Assessment (RVA)

The purpose of conducting a subnational baseline Risk and Vulnerability Assessment (RVA) was to characterize elements of multi-hazard risk. The subnational NDBPA RVA was adapted from PDC's established Global RVA framework to meet the specific needs of the Dominican Republic. To capture the complex concept of risk, PDC's RVA leverages a composite-index approach. Composite indices are constructed by combining data sets that represent general themes that contribute to risk (e.g., access to information, health status, or governance). These individual variables, or *indicators,* are uniform and quantifiable characteristics that reflect the overall concepts required for analysis. Appropriate subnational indicators were identified in partnership with stakeholders. The data were combined to represent the components of hazard exposure, vulnerability, and coping capacity.

Multi-Hazard Exposure

Multi-Hazard Exposure is characterized by the people, property, systems, and other elements present in hazard zones that are subject to potential losses. For this assessment, exposure considers six hazard types:

Cyclone

Areas exposed to tropical cyclone wind speeds that coincide with the Saffir-Simpson Scale, Category 1 or higher.

Earthquake

Areas with MMI VII and above were based on 1.0 second spectral acceleration at a 2500 year return period.

Tsunami

Tsuanmi hazard zones as provided by CNE.

Flood

Flood hazard zones as provided by CNE.

Landslide

Areas with medium to very high susceptibilty to landslide.

The Multi-Hazard Exposure Index is a function of both raw- and relative-population exposure. Raw-population exposure provides an indication of how many people are exposed, which can assist in planning and provide a better understanding of the raw scale of potential response activities needed, such as evacuation or sheltering. In contrast, relative-population exposure is expressed as a proportion of base population. This provides an indication of how important a hazard is within a region, helping to facilitate prioritization in the decision-making process. Relative exposure also helps assess the relevance of hazards within regions that have relatively small populations.

Vulnerability

Vulnerability can act to intensify hazard impacts, increasing overall risk. The Vulnerability Index was designed to capture the multi-dimensional nature of

poverty, the inequality in access to resources due to gender, and the ability of a given area to adequately support the population. The dimensions of poverty measured are economic, health, living standards, and information access. Poverty is a major contributor to disaster vulnerability. However, pressures based on demographic factors like population growth and environmental quality also affect vulnerability throughout the country. In the Dominican Republic, Economic Constraints, Access to Information, Gender Inequality, Clean Water Vulnerability, Environmental Stress, Vulnerable Health Status, and Population Pressures are significant determinants of provincial vulnerability in areas with high Multi-Hazard Risk. The components of Vulnerability are defined here:

Economic Constraints
Represents the limitations on the resources available to invest in mitigation and preparedness measures at the individual, household, and country levels.

Access to Information
Represents the ability to access and comprehend hazard- and disaster-related information before, during, and after an event.

Gender Inequality
Represents gender-based differences in access to resources, services, opportunities, and formal economic and political structures.

Clean Water Vulnerability
Represents the general state of water-related infrastructure. Poor distribution and containment systems contribute to reduced water quality and increase the potential for spread of disease.

Environmental Stress
Substantial water stress and land degradation can damage habitat and reduce quantity and quality of resources required to maintain human health and livelihoods. These stressors increase the likelihood and magnitude of hazards, such as flooding and landslides, while exacerbating impacts.

Vulnerable Health Status
Reflects the population's general health. Poor health contributes to increased susceptibility to injury, disease, and stress associated with disasters, and may necessitate special accommodations for activities such as evacuation.

Population Pressures
Refers to rapid, significant changes in the size and distribution of a population. Such changes tend to be difficult to plan for, and can destabilize social, economic, and environmental systems, placing additional stress on resources and infrastructure.

Coping Capacity

Coping capacity describes the ability of people, organizations, and systems, using available skills and resources, to face and manage adverse conditions, emergencies, or disasters. Unlike Multi-Hazard Exposure and Vulnerability, the Coping Capacity Index was calculated using a *weighted average* of the four subcomponents. Governance was weighted at 30%, Infrastructure at 30%, Economic Capacity at 30%, and Environmental Capacity at 10%. The weighting serves to emphasize the relative importance of each dimension's contribution to the concept of Coping Capacity, and takes into consideration the quality of available data. Thematic areas with less information or lower quality data are therefore de-emphasized. In the case of the Dominican Republic, the quantity and quality of environmental capacity data are generally limited.

Environmental Capacity
Represents the ability of the environment to recover from shock and maintain species health, biodiversity, and critical ecosystem services after impact. The environment can provide food/water and even tourism benefit.

Economic Capacity
Represents a region's ability to absorb immediate economic losses and quickly mobilize financial assets for response and recovery activities.

Governance
Reflects the stability and effectiveness of institutional structures to provide public services, freedom in selecting government, and enforcement of laws to prevent and control crime and violence. Instability of institutional structures can make a region more susceptible to the effects of hazard impacts.

Infrastructure Capacity
Represents the resources that enable the exchange of information (communications) and the physical distribution of goods and services to the population (transportation and health care).

Communications Capacity
Represents the density and variety of communications infrastructure available to support coordinated action among local, national, and international actors.

Transportation Capacity
Denser transportation networks provide more options for bringing outside resources into a country (ports and airports) and increase the likelihood of alternate routes for reaching impacted populations.

Health Care Capacity
Represents availability of skilled caregivers and facilities, and whether populations have access to vital resources before, during, and after a hazard event.

Lack of Resilience

The Lack of Resilience Index represents the combination of susceptibility to impact and the relative inability to absorb, respond to, and recover from negative impacts that occur over the short term. The lack of resilience provides an indication of current socioeconomic conditions on the ground independent of hazard exposure. These data can be used during hazard events to prioritize response efforts. The basic model for Lack of Resilience Index is:

Multi-Hazard Risk

Multi-Hazard Risk (MHR)
The combination of Multi-Hazard Exposure, susceptibility to impact (Vulnerability), and the relative inability to absorb, respond to, and recover from negative impacts that occur over the short term (Coping Capacity).

Multi-Hazard Exposure (MHE)
People, property, systems, or other elements present in hazard zones that are subject to potential losses.

Vulnerability (V)
The characteristics and circumstances of a community, system, or asset that make it susceptible to the damaging effects of a hazard.

Coping Capacity (CC)
The ability of people, organizations, and systems, using available skills and resources, to face and manage adverse conditions, emergencies, or disasters.

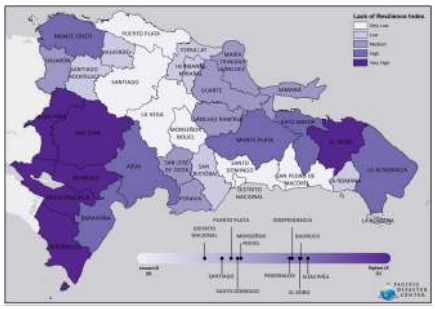
The basic model for the Multi-Hazard Risk Index is:

Multi-Hazard Risk = $[\text{Multi-hazard Exposure} + \text{Vulnerability} + (1 - \text{Coping Capacity})]/3$

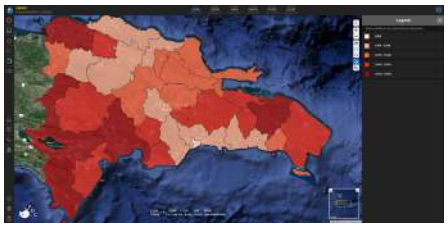
Methodological Process

Table 4. NDPBA Risk and Vulnerability Assessment (RVA) Methodological Process

Data Gathering
- Online/archival research
- Stakeholder interviews



Data Processing & Analysis
- Indicator development
- Index construction



RVA Findings
- Reporting and dissemination
- DisasterAWARE™ data integration

Data Gathering

In partnership with stakeholders, a review of archival research and stakeholder interviews were conducted to identify potential data to be included in the study. Each indicator was gathered from vetted sources and evaluated for potential use in the RVA model. Data were scrutinized to identify possible gaps and missing values, and to document any caveats regarding data quality or completeness. In certain cases, missing documentation or lack of data lineage precluded the use of datasets

in the analysis. For details on the RVA data sets used in this analysis see Appendix A: RVA Component Index Hierarchies and Thematic Rationale.

Data Processing and Analysis

Datasets used in the analysis were standardized for use as indicators in order to make meaningful comparisons. For details on RVA index construction see Appendix B: RVA Index Construction.

RVA Findings

The results of the analysis helped to identify potential areas in which to focus limited resources to reduce disaster risk. As part of the final report, programmatic recommendations at the national level and specific strategies to reduce vulnerabilities and increase coping capacities at the subnational level are provided. The analyzed data have been integrated into PDC's DisasterAWARE™.

Comprehensive Disaster Management (CDM)

Comprehensive Disaster Management (CDM) is the integrated approach of managing hazards through all phases of disaster management. Leveraging the latest academic research, the CDM analysis examines core elements of effective disaster management. The assessment is constructed to provide a systematic understanding of the challenges to operationalizing disaster management techniques in support of diverse community needs. The results of the assessment provide necessary information for policy makers to effectively direct investments in an effort to save lives and reduce losses. The CDM assessment can provide greater context to the RVA by placing the risk of each province into the larger DRR framework of the Dominican Republic.

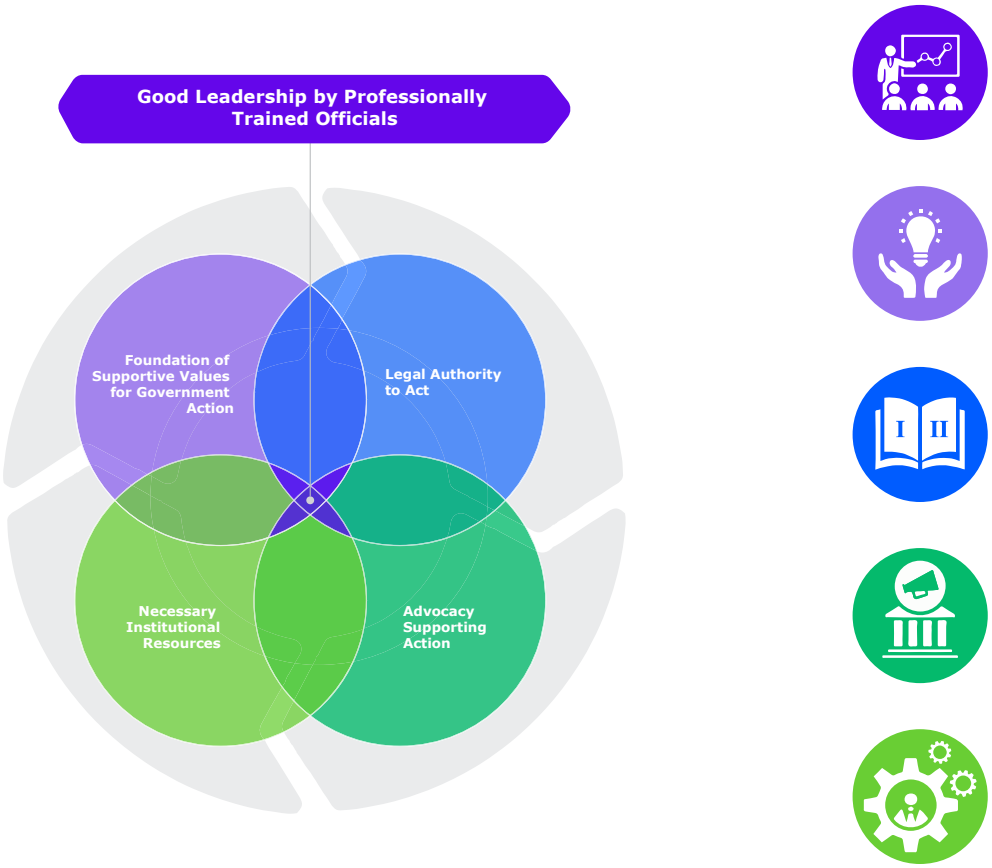


Figure 2. Comprehensive Disaster Management elements

For the purposes of this assessment, CDM is conceptualized as a function of five elements:

Good Leadership by Professionally Trained Officials
The basis of successful disaster management centers upon the importance of well-trained professionals. A community or country that has established professionalization of the disaster management field through formalized training and education programs is ensuring a foundation of understanding and leadership among disaster management personnel at all levels. Training and exercises offer opportunities to build leadership capacity in the disaster management field, increasing the professionalization of the field.

Foundation of Supportive Values for Government Action
Enables concepts to be developed into policies and provides government leaders the backing to spend money to obtain necessary resources. This is critical for communities and countries with a limited economic base. Disaster preparedness is only one of many issues a government may face. Government support must be encouraged to ensure that the proper importance is placed on disaster management mitigation and preparedness in an effort to build disaster-resilient communities with a focus on saving lives and reducing disaster losses.

Legal Authority to Act
Provides the necessary foundation for implementation of CDM. The legal framework within which disaster operations occur has a significant impact on preparedness, response, recovery, and mitigation. Without the authority to act and the support of government officials, CDM activities can be halted, leaving residents vulnerable to disasters.

Advocacy Supporting Action
Ensures that disaster management policies are implemented nationwide. The backing of political leaders is not always enough to ensure that hazard policies are implemented. Successful disaster management requires strong stakeholder support across all levels. Following a disaster, stakeholder support for action is generally high and may play a key role in hazard-policy implementation. Stakeholders include traditional and non-traditional partners involving the general public, non-governmental organizations, academic institutions, the private sector, and those providing assistance before, during, and after a disaster.

Necessary Institutional Resources
Provides an accurate assessment of available resources (human and material) in every jurisdiction and the availability of those resources during a disaster. Although a jurisdiction may have a limited economic base and few immediate resources, through mutual-aid agreements with neighboring jurisdictions, resources can be easily mobilized to respond. Being able to quickly assess the community needs and having the knowledge of available resources, aid can be requested in a timely manner to ensure immediate emergency needs are met.

Methodological Process

The methodological process for the CDM is illustrated in Table 5. CDM data were analyzed using a mixed-methods approach. The approach combined both qualitative and quantitative data and methods of analysis, allowing for a more complete assessment of the CDM theoretical framework.

Table 5. NDPBA Comprehensive Disaster Management (CDM) methodological process

Data Gathering
- Archival research
- 100 surveys
- 27 interviews
- 8 site visits

Data Processing & Analysis
- Quantitative and qualitative analysis of data inputs

CDM Findings
- Final report documents successes and areas for CDM enhancement
- DisasterAWARE^{TM} data integration

Data Gathering

Archival research, surveys, and interviews were the primary data-gathering methods used to gain insight into existing capabilities of the Dominican Republic's disaster management structure. Interviews with stakeholders and surveys administered during Knowledge Exchange workshops corroborated information obtained through online research. All information collected was put in context using elements of the CDM framework as a guide. Figure 3 illustrates the types of information gathered and analyzed for each component of the CDM analysis.

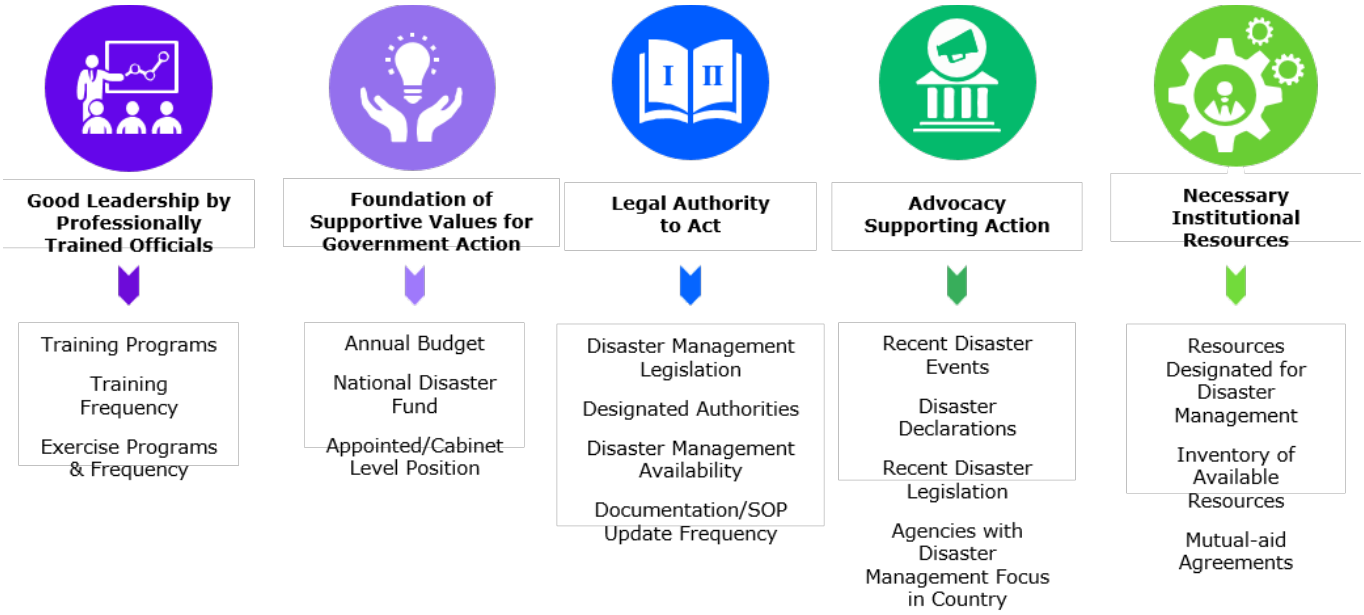


Figure 3. Datasets for CDM Analysis

Data Processing and Analysis

Three CDM surveys were administered over the course of the project, with emphasis on questions related to disaster preparedness and response activities. Survey responses were analyzed either quantitatively or qualitatively, depending upon the question. Summary statistics and frequencies were generated for ranked-response questions. Open-ended questions helped to identify recurring themes that could be further explored during interviews with disaster management stakeholders. Survey responses are discussed in **Appendices C, D,** and **E**.

CDM Findings

CDM results helped to identify existing strengths and potential challenges that limit the delivery of effective disaster management. As part of this report, programmatic recommendations are provided to strengthen preparedness and response capacities, and thereby safeguard lives and reduce disaster losses

Better solutions.
Fewer disasters.
Safer world.

PDC | GLOBAL

Findings: National

National Disaster Preparedness Baseline Assessment
Final Report

Risk and Vulnerability Assessment (RVA)

Based on PDC's Global Risk and Vulnerability Assessment, Dominican Republic ranks 40th in multi-hazard risk in the world, overall. In Dominican Republic, risk is driven primarily by high multi-hazard exposure coupled with limited coping capacity. Though Dominican Republic ranks relatively moderate in vulnerability at the national level, high poverty rates and gender inequality contribute significantly to overall vulnerability. The subnational risk assessment describes how these factors of multi-hazard risk are distributed across provinces in Dominican Republic. The RVA results presented in this section represent the analysis of the thirty-two (32) provinces in Dominican Republic. The RVA results highlight regions of Dominican Republic that may be in greater need for support due to increased population exposure, higher vulnerability or lower coping capacity. The RVA helps to:

Identify Disaster Risk Reduction Priorities
Helps stakeholders develop a five-year action plan to achieve risk reduction goals and to enhance disaster mitigation, preparedness, response, and recovery.

Assess Drivers of Risk
Allows examination from index to dataset level, identifying the level of exposure an area has to multiple hazards, the aspects of population that make them susceptible to hazard impact, and areas that can be improved to support coping strategies following hazard events.

Provide a Baseline for Resource Distribution
Identify areas that may need additional support before, after, and during hazard events.

Table 6 provides a summary of the component results for Multi-Hazard Risk (MHR), Multi-Hazard Exposure (MHE), Vulnerability (V), Coping Capacity (CC), including index scores, and relative ranking among the 32 provinces. A rank of 1 corresponds to a high score (e.g., high multi-hazard risk), while a rank of 32 indicates a low score (e.g., low multi-hazard risk).

Table 6. Dominican Republic Multi-Hazard Risk (MHR) Index scores, rankings and component indices, by province.

Province	Multi-Hazard Risk		Multi-Hazard Exposure		Vulnerability		Coping Capacity		Province Risk Level
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	
Duarte	0.588	1	0.792	4	0.395	22	0.422	24	Very High
El Seibo	0.584	2	0.458	22	0.601	5	0.305	31	Very High
Monte Plata	0.567	3	0.569	16	0.497	10	0.365	29	Very High
Baoruco	0.563	4	0.382	24	0.655	1	0.349	30	Very High
Espaillat	0.561	5	0.779	5	0.356	24	0.451	20	Very High
Monte Cristi	0.558	6	0.584	15	0.565	7	0.475	14	Very High
María Trinidad Sánchez	0.555	7	0.691	11	0.398	20	0.423	23	Very High
Santo Domingo	0.538	8	0.829	2	0.328	28	0.544	6	High
Hermanas Mirabal	0.538	9	0.707	8	0.392	23	0.486	11	High
Valverde	0.536	10	0.682	12	0.482	12	0.556	4	High
La Altagracia	0.532	11	0.568	17	0.542	8	0.515	9	High
Independencia	0.531	12	0.356	27	0.635	2	0.399	27	High
Sánchez Ramírez	0.530	13	0.588	14	0.403	19	0.401	26	High
Santiago	0.528	14	0.93	1	0.261	31	0.606	2	High
La Vega	0.525	15	0.725	7	0.398	21	0.547	5	Medium
Hato Mayor	0.525	16	0.539	19	0.496	11	0.461	19	Medium
San Pedro de Macorís	0.519	17	0.691	10	0.351	26	0.485	12	Medium
Puerto Plata	0.516	18	0.815	3	0.311	30	0.579	3	Medium
San Juan	0.515	19	0.372	25	0.54	9	0.367	28	Medium
Samaná	0.507	20	0.540	18	0.446	16	0.463	16	Medium
Monseñor Nouel	0.504	21	0.701	9	0.320	29	0.508	10	Low
La Romana	0.497	22	0.608	13	0.412	18	0.528	8	Low
Peravia	0.490	23	0.459	21	0.473	14	0.462	18	Low
Elías Piña	0.490	24	0.105	32	0.606	4	0.242	32	Low
Azua	0.473	25	0.370	26	0.585	6	0.536	7	Low
Barahona	0.472	26	0.393	23	0.458	15	0.435	21	Low
Dajabón	0.457	27	0.355	29	0.440	17	0.424	22	Very Low
San Cristóbal	0.451	28	0.478	20	0.338	27	0.463	17	Very Low
Pedernales	0.440	29	0.109	31	0.631	3	0.419	25	Very Low
Distrito Nacional	0.426	30	0.764	6	0.153	32	0.639	1	Very Low
Santiago Rodríguez	0.411	31	0.355	28	0.353	25	0.475	13	Very Low
San José de Ocoa	0.393	32	0.172	30	0.476	13	0.470	15	Very Low

Multi-Hazard Exposure

The population of the Dominican Republic experiences very high levels of exposure to seismic activity and tropical cyclone winds. Volcanic hazards also pose a significant threat, while smaller proportions of the population are also exposed to landslides, inland floods, and tsunami hazard zones. See Figure 4 for total population exposure to hazards in the Dominican Republic.

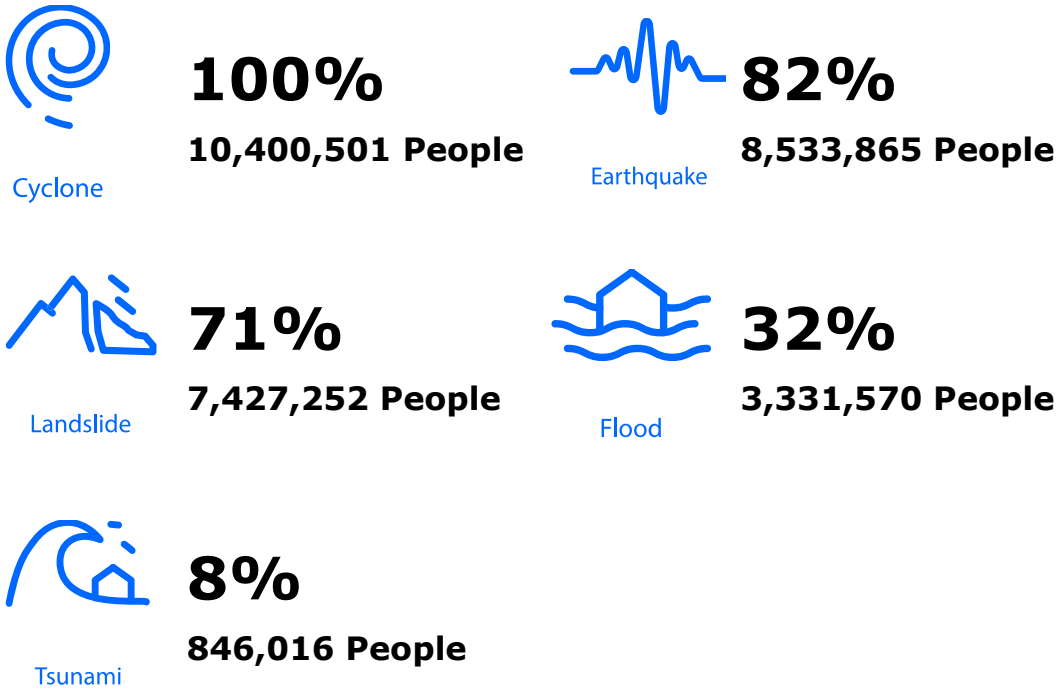


Figure 4. Population exposure to hazards in the Dominican Republic.

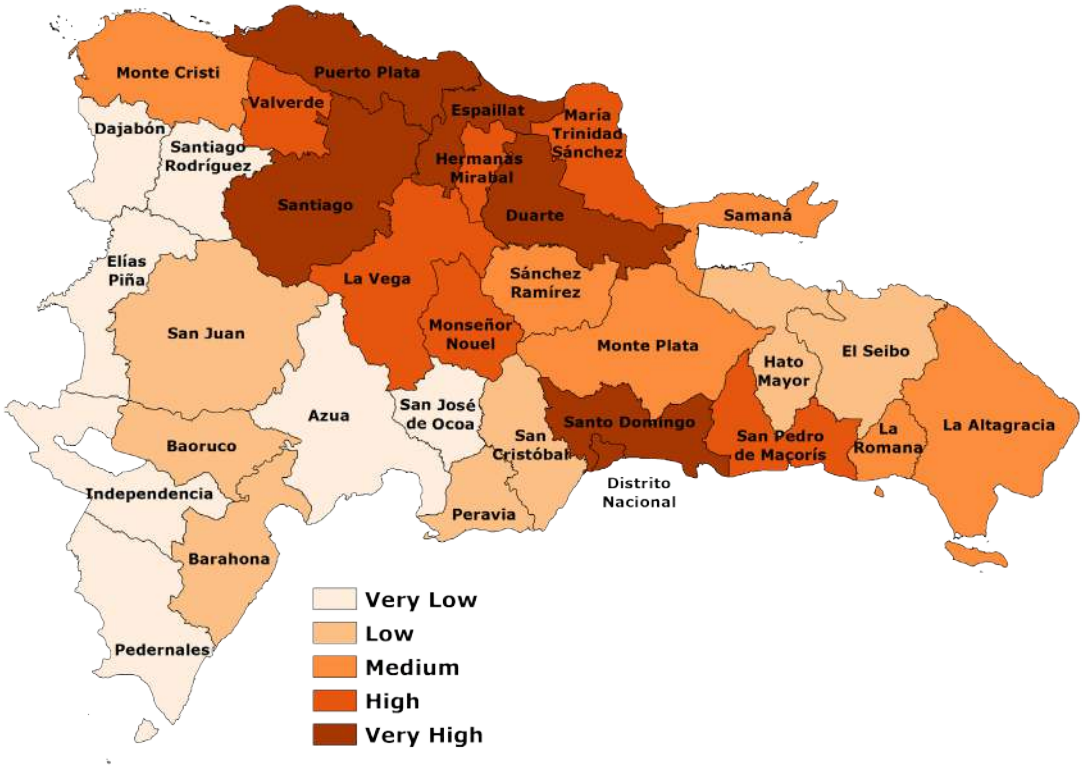


Figure 5. Distribution of Multi-Hazard Exposure Index scores across provinces with relative ranking of each province by Multi-Hazard Exposure score.

Examining hazard exposure data for each hazard type provides a cross-section that can be used to identify the specific hazards contributing to exposure in each province. Understanding exposure to specific hazards is valuable for determining appropriate mitigation actions. Differences in the type of hazard inherently dictate which mitigation options could be most effective in reducing losses and casualties in the Dominican Republic. For example, tsunami warning sirens may help to warn the public in Puerto Plata but would be ineffective to reduce loss from seismic activity in Hermanas Mirabel. This assessment demonstrates the importance of understanding hazard exposure not only in terms of the total number of people exposed, but also the hazards that threaten them (see Figure 5). At the provincial level, Multi-Hazard Exposure ranges from very high in the densely populated and highly exposed province of Santo Domingo, to very low in less-populated and less hazard-prone areas, such as Elías Piña and San Juan.

Vulnerability

PDC's Global Risk and Vulnerability Assessment shows that vulnerability in the Dominican Republic has decreased slightly since 1995. Though the country once ranked 63rd in the world for overall vulnerability, the Dominican Republic now ranks 79th in the globe in overall vulnerability. Despite this progress, poverty in the Dominican Republic remains relatively high, and access to basic services continues to be a persistent challenge. Given these challenges, certain regions lack the adequate resources to build disaster resilience at local, household, and individual levels. As a result, vulnerable regions may rely heavily on national resources to prepare for, respond to, and recover from disasters. Areas with higher Vulnerability Index scores are more susceptible to harm from hazards, often lacking the resources to adequately implement preparedness or mitigation measures. Recognizing the sensitivities of vulnerable areas, the Vulnerability Index (illustrated in Figure 6 below) is an instrument for decision support in comparing and prioritizing disaster mitigation projects and allocating aid following hazard events.

The Vulnerability Index was designed to capture the multi-dimensional nature of poverty, the inequality in access to resources due to gender, and the ability of a given area to adequately support the population. The dimensions of poverty measured are economic, health, living standards, and information access. Poverty is a major contributor to disaster vulnerability, however pressures based on demographic factors like population growth and environmental quality also affect vulnerability throughout the country.

Table 7. Vulnerability Scores and Ranks in Dominican Republic

Province	Vulnerability	
	Score	Rank
Baoruco	0.655	1
Independencia	0.635	2
Pedernales	0.631	3
Elías Piña	0.606	4
El Seibo	0.601	5
Azua	0.585	6
Monte Cristi	0.565	7
La Altagracia	0.542	8
San Juan	0.54	9
Monte Plata	0.497	10
Hato Mayor	0.496	11
Valverde	0.482	12
San José de Ocoa	0.476	13
Peravia	0.473	14
Barahona	0.458	15
Samaná	0.446	16
Dajabón	0.440	17
La Romana	0.412	18
Sánchez Ramírez	0.403	19
María Trinidad Sánchez	0.398	20
La Vega	0.398	21
Duarte	0.395	22
Hermanas Mirabal	0.392	23
Espaillat	0.356	24
Santiago Rodríguez	0.353	25
San Pedro de Macorís	0.351	26
San Cristóbal	0.338	27
Santo Domingo	0.328	28
Monseñor Nouel	0.320	29
Puerto Plata	0.311	30
Santiago	0.261	31
Distrito Nacional	0.153	32

At the provincial level, vulnerability ranges from very high in Baoruco – to very low in Distrito Nacional, see Table 6 for Vulnerability scores and ranks by province.

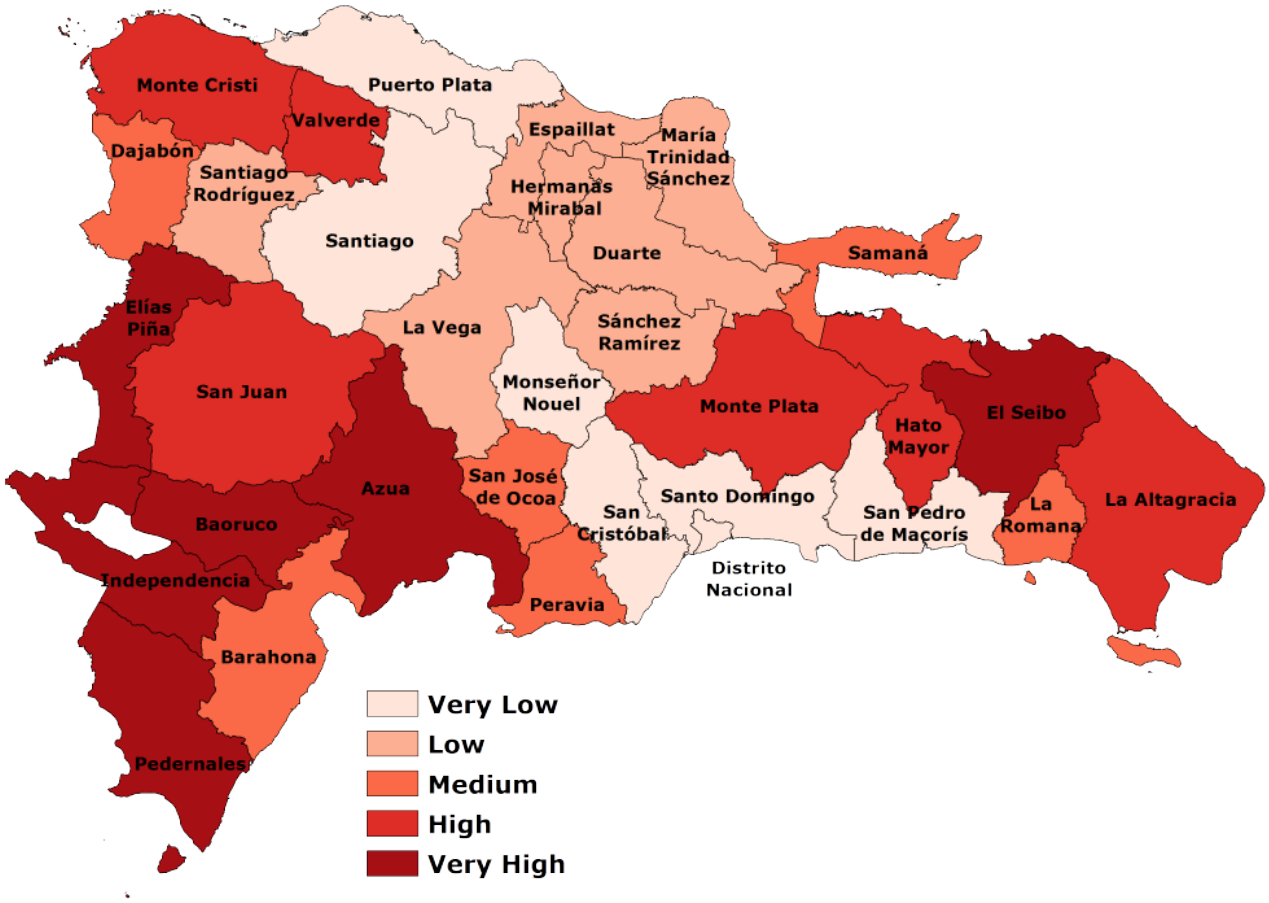


Figure 6. Distribution of Vulnerability Index scores across provinces and relative ranking of each province by Vulnerability score.

Vulnerability: Case Study

Examining the subcomponents of the Vulnerability Index can highlight the drivers of vulnerability within provinces. In context, these sensitivities translate to increased susceptibility to hazard impacts because of limited economic resources, inability to access and comprehend vital emergency information, compromised water and sanitation services, rapid changes in urban population, disparities in health and health care access, and gender-based differences in access to resources, services, and opportunities. The table below examines the specific drivers of vulnerability in the three most vulnerable provinces.

Baoruco – Highest Vulnerability (1 of 32 Provinces)

Vulnerable Health Status
Very High (Rank: 1 of 32)

Economic Constraints
Very High (Rank: 4 of 32)

Information Access Vulnerability
Very High (Rank: 4 of 32)

Baoruco has high rates of Maternal Mortality and Chronic Malnutrition indicating challenges with the health of the population. Therefore, interventions that increase the caloric intake of children and maternal health would most certainly also serve to reduce overall Vulnerability.

Independencia – 2nd Highest Vulnerability (2 of 32 Provinces)

Information Access Vulnerability
Very High (Rank: 3 of 32)

Economic Constraints
Very High (Rank: 3 of 32)

Environmental Stress
Very High (Rank: 4 of 32)

Independencia has some of the lowest literacy rates and school enrollment in the country, combined with low availability of internet, TV and radio access. Interventions focused on education and access to information would help to increase the understanding of disaster risk in Independencia and reduce overall vulnerability.

Pedernales – 3rd Highest Vulnerability (3 of 32 Provinces)

Information Access Vulnerability
Very High (Rank: 1 of 32)

Economic Constraints
Very High (Rank: 2 of 32)

Clean Water Vulnerability
Very High (Rank: 4 of 32)

Nearly 78% of the population of Pedernales lives in poverty and more than half receive monthly CEP benefits. Development strategies that prioritize a decrease poverty and increase the economic strength in Pedernales would decrease overall vulnerability.

While the factors of vulnerability are inextricably linked, a single intervention may not reduce all components of vulnerability in all provinces. This illustrates the utility of the Vulnerability Index in guiding resource allocation and highlights the importance of a thorough examination of all dimensions of vulnerability to inform decision making at the sub-national level.

Coping Capacity

In the Central American Region, Dominican Republic ranks third lowest in overall coping capacity, according to PDC's Global RVA. The country's limited coping capacity is driven primarily by constraints on governance, economy, and infrastructure. These indicators are reflected at subnational level where coping capacity is largely driven by Governance and Infrastructure. This

indicates that provinces may have limited ability to absorb immediate economic losses and mobilize resources during a disaster.

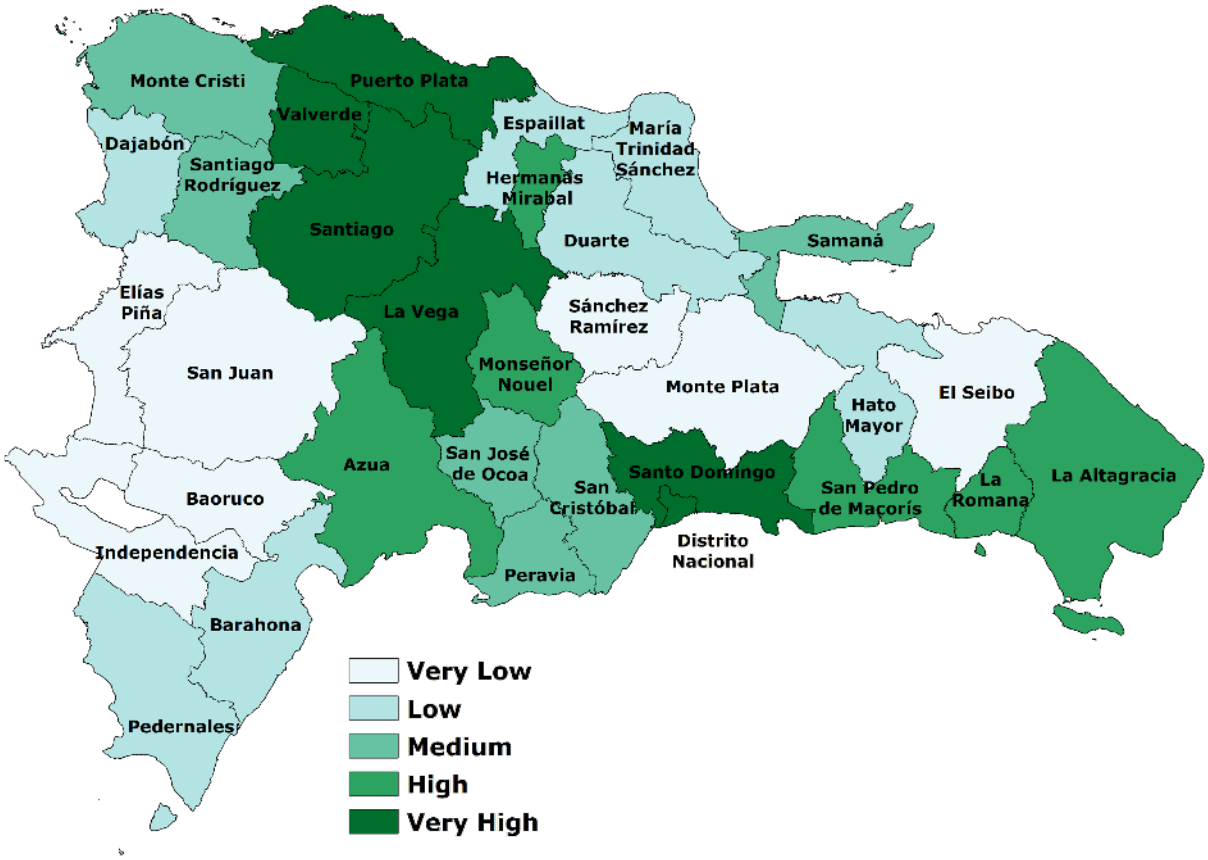


Figure 7. Distribution of Coping Capacity Index scores across provinces and relative ranking of each province by Coping Capacity score.

By analyzing the different subcomponents of the Coping Capacity Index, it becomes possible to identify distinct factors that drive a population's or organization's difficulty to cope with hazards. Elías Piña (ranked 32 of 32) has low coping capacity due to decreased Economic Capacity and Transportation Infrastructure. Low coping capacity in El Seibo (ranked 31 of 32) is primarily driven by low Governance, Environmental Strength, and Infrastructure (Communication). Lower infrastructure scores can indicate a reduction in the exchange of information and access to healthcare and services.

Table 8. Coping Capacity Scores and Ranks in Dominican Republic

Province	Coping Capacity	
	Score	Rank
Distrito Nacional	0.639	1
Santiago	0.606	2
Puerto Plata	0.579	3
Valverde	0.556	4
La Vega	0.547	5
Santo Domingo	0.544	6
Azua	0.536	7
La Romana	0.528	8
La Altagracia	0.515	9
Monseñor Nouel	0.508	10
Hermanas Mirabal	0.486	11
San Pedro de Macorís	0.485	12
Santiago Rodríguez	0.475	13
Monte Cristi	0.475	14
San José de Ocoa	0.470	15
Samaná	0.463	16
San Cristóbal	0.463	17
Peravia	0.462	18
Hato Mayor	0.461	19
Espaillat	0.451	20
Barahona	0.435	21
Dajabón	0.424	22
María Trinidad Sánchez	0.423	23
Duarte	0.422	24
Pedernales	0.419	25
Sánchez Ramírez	0.401	26
Independencia	0.399	27
San Juan	0.367	28
Monte Plata	0.365	29
Baoruco	0.349	30
El Seibo	0.305	31
Elías Piña	0.242	32

The analysis of subcomponents provides additional insight into each province. Hermanas Mirabel, Peravia, and Duarte all ranked lowest in Governance. Weaker Governance may lead to a range of problems in the management of hazards, including reduced public safety and ineffective disaster planning. Additional support for local police, firefighters, and emergency medical resources may improve public safety, both in normal conditions and during an emergency. Adopting comprehensive plans for each phase of disaster management, and engaging the public to both understand and inform these plans, could improve governance in the context of this assessment.

Limited economic capacity means these areas may not have financial assets, savings, or reserves to absorb immediate economic impacts, mobilize response and recovery services, or aid in disaster relief. In provinces with low economic capacity, disaster management practitioners

can leverage mutual aid agreements and non-traditional partnerships to support disaster preparedness, response relief initiatives. For example, Santiago (ranked 2 of 32) and San Juan (ranked 28 of 32) share a border in central Dominican Republic but exhibit scores on opposite sides of the Coping Capacity Index. During a disaster, resource sharing could be beneficial to San Juan in the form of mutual-aid from Santiago which may be more capable of providing aid during disaster response and recovery.

Lack of Resilience

The Lack of Resilience index (mapped in Figure 8) represents the combination of Vulnerability and Coping Capacity. The graduation from two separate components to the larger overarching concept of resilience demonstrates the hierarchical approach of PDC's RVA, whereby results are built upwards to develop indices that have distinct implications for disaster risk reduction. Furthermore, as Vulnerability and Coping Capacity are measured independent of the hazard, disaster managers can overlay the Lack of Resilience Index with real-time hazard data to estimate risk on a per-event basis as new threats occur. Table 9 summarizes the results of the Lack of Resilience Index for the Dominican Republic.

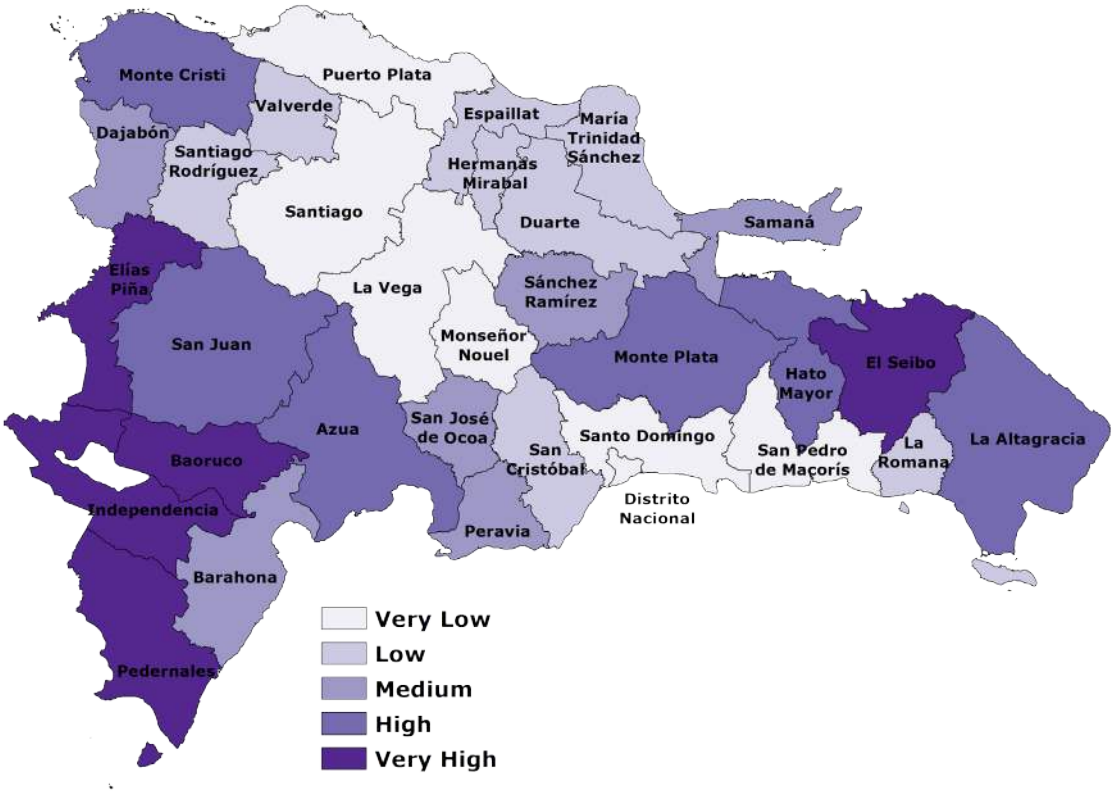


Figure 8. Distribution of Lack of Resilience Index scores across province and relative ranking of each province by Lack of Resilience score.

Table 9. Dominican Republic Lack of Resilience Index (LR) scores and rankings, by province.

Province	Lack of Resilience		Vulnerability		Coping Capacity		Province Lack of Resilience
	Score	Rank	Score	Rank	Score	Rank	
Elías Piña	0.682	1	0.606	4	0.242	32	Very High
Baoruco	0.653	2	0.655	1	0.349	30	Very High
El Seibo	0.648	3	0.601	5	0.305	31	Very High
Independencia	0.618	4	0.635	2	0.399	27	Very High
Pedernales	0.606	5	0.631	3	0.419	25	Very High
San Juan	0.586	6	0.54	9	0.367	28	Very High
Monte Plata	0.566	7	0.497	10	0.365	29	Very High
Monte Cristi	0.545	8	0.565	7	0.475	14	High
Azua	0.525	9	0.585	6	0.536	7	High
Hato Mayor	0.518	10	0.496	11	0.461	19	High
La Altagracia	0.514	11	0.542	8	0.515	9	High
Barahona	0.511	12	0.458	15	0.435	21	High
Dajabón	0.508	13	0.44	17	0.424	22	High
Peravia	0.506	14	0.473	14	0.462	18	High
San José de Ocoa	0.503	15	0.476	13	0.47	15	Medium
Sánchez Ramírez	0.501	16	0.403	19	0.401	26	Medium
Samaná	0.491	17	0.446	16	0.463	16	Medium
María Trinidad Sánchez	0.487	18	0.398	20	0.423	23	Medium
Duarte	0.487	19	0.395	22	0.422	24	Medium
Valverde	0.463	20	0.482	12	0.556	4	Medium
Espaillat	0.453	21	0.356	24	0.451	20	Low
Hermanas Mirabal	0.453	22	0.392	23	0.486	11	Low
La Romana	0.442	23	0.412	18	0.528	8	Low
Santiago Rodríguez	0.439	24	0.353	25	0.475	13	Low
San Cristóbal	0.437	25	0.338	27	0.463	17	Low
San Pedro de Macorís	0.433	26	0.351	26	0.485	12	Low
La Vega	0.425	27	0.398	21	0.547	5	Very Low
Monseñor Nouel	0.406	28	0.32	29	0.508	10	Very Low
Santo Domingo	0.392	29	0.328	28	0.544	6	Very Low
Puerto Plata	0.366	30	0.311	30	0.579	3	Very Low
Santiago	0.327	31	0.261	31	0.606	2	Very Low
Distrito Nacional	0.257	32	0.153	32	0.639	1	Very Low

Multi-Hazard Risk

The Multi-Hazard Risk Index (mapped in Figure 9) provides a high-level tool that supports comparison of risk across Dominican Republic. Though the MHR Index provides a powerful overview of risk conditions, its component indices – Multi-Hazard Exposure, Vulnerability, and Coping Capacity – and their subcomponents provide crucial details on the drivers of risk. These drivers can be used to design focused interventions for overall disaster risk reduction at the provincial level.

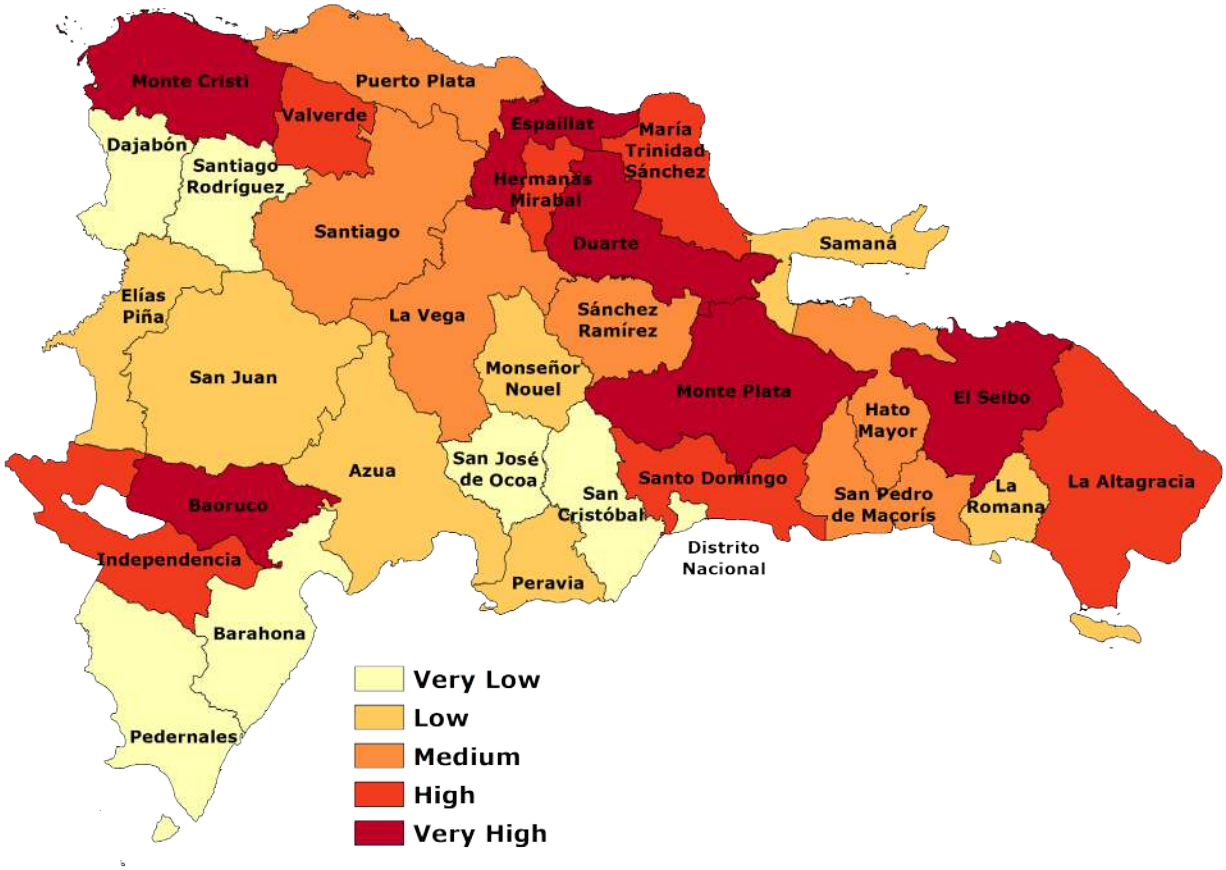


Figure 9. Distribution of Multi-Hazard Risk Index scores across provinces and relative ranking of each province by Risk score.

Recommendations

01

Strengthen Data Standards and Sharing

C. Ensure that hazards and vulnerability data are consistently defined, documented, updated, and applied in disaster management and disaster risk reduction.
D. Implement strategies to strengthen data sharing and transparency between all organizations active in disaster management to support evidence-based decision making.

Effort:

Complexity: Medium

Cost: $

02

Develop and Strengthen Multi-stakeholder Partnerships

C. Increase the capacity to conduct and update high-resolution hazard assessments with national coverage by developing partnerships with non-traditional stakeholders.
D. Strengthen strategic multi-stakeholder partnerships to expand disaster risk reduction resources to include non-traditional disaster management partners.

Effort:

Complexity: Low

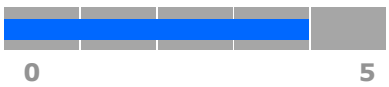
Cost: $

03

Improve Documentation of Subnational Economic Resources

Provide a more comprehensive understanding of economic capacity (ex. GDP, income, expenditures, remittances) at the province and local levels. Resource documentation allows stakeholders to immediately identify when capacities are exceeded.

Effort:



Complexity: High

Cost: $$

Specific recommendations to reduce vulnerability and increase coping capacity in each province are provided in the province risk profiles.

Comprehensive Disaster Management (CDM)

Overview

CDM assessment results highlight aspects of disaster management that may help address issues associated with increased exposure to natural hazards, higher socio-economic vulnerability or lower coping capacity. Overall, the CDM assessment helps to:

Identify Disaster Management Capabilities
Provides a contextual overview of disaster management capabilities and identifies the strengths and challenges of the Dominican Republic's disaster management system.

Provide Context to RVA Results
Provides context to the RVA results previously discussed by highlighting the larger DRR framework in the Dominican Republic.

Successes, challenges, and their implications for the overall effectiveness of the Dominican Republic's disaster management system are outlined in detail in the following sections based on the five key elements assessed. Recommendations are provided for each CDM element to assist in strengthening disaster management capacities in-country. See Table 10 for the evaluation criteria of CDM recommendations.

The assessment is the result of a partnership with many organizations active in disaster management within the country. Interviews were conducted with forty-eight disaster management partners from fifteen organizations. The PDC project team conducted site visits to critical facilities including the Centro de Operaciones de Emergencias (COE), provincial and municipal Comités de Prevención, Mitigación y Respuesta (PMR), disaster stocks warehouses, and government and NGO partners. Responses to survey questions are included for reference in **Appendices C, D** and **E**.

Data were analyzed using a mixed-methods approach, with quantitative and qualitative information integrated into the overall findings and recommendations. This approach allowed for a more complete assessment of policy, critical inventory and facilities, and perceptions of disaster management in the Dominican Republic.

Summary

Key Successes

Overall, this assessment finds that the Dominican Republic has a strong national disaster management system. Key successes of the system include:

Inclusive training program

The Dominican Republic fosters an open and inclusive training program for disaster management professionals.

National level exercises occur on a regular basis

The Comisión Nacional de Emergencias (CNE – National Emergency Commission) regularly conducts national-level exercises at the Centro de Operaciones de Emergencia (COE – Emergency Operations Center) and invites all COE members.

National Risk Management School

CNE operates the National Risk Management School and training is generally available to disaster management personnel at the national level.

Annual appropriation for CNE and Defensa Civil

Funding is appropriated annually for the operational needs of CNE and Defensa Civil.

Culture of volunteerism

Paid staff of Defensa Civil is augmented by over 8,000 active volunteers, evidence of a strong spirit of volunteerism that greatly contributes to the country's culture of preparedness.

Ley 147-02

Ley 147-02 (the country's disaster management law) establishes the response system and roles and responsibilities from the national level down to the municipal level and is regularly reviewed and updated.

Highly Integrated Disaster Preparedness and Response Plans

Disaster preparedness and response plans are highly integrated at the national level and facilitate both intra-governmental response actions and close collaboration between the government and NGOs.

NGO engagement

NGOs are actively involved in the disaster management system and are regularly engaged by CNE and Defensa Civil.

Government resources are available

All government resources are available during disasters and the COE is a 24/7 facility with equipment and backup power, food and water, and an emergency communications system

Key Challenges

Although the Dominican Republic has a strong disaster management system, the assessment process has identified a number of challenges. The challenges identified will limit the ability of the Dominican Republic to most effectively prepare for and respond to disasters. Key challenges include:

Lack of adequate facilities

The most significant challenge facing the Dominican Republic is a lack of adequate facilities. This includes a lack of space in the COE during large disasters and inadequate *salas* (disaster coordination centers) at the regional and provincial levels.

Staff Training Requirements

There are no established training requirements for disaster management personnel.

Lack of capacity and resources

A lack of capacity and resources at the provincial and municipal levels.

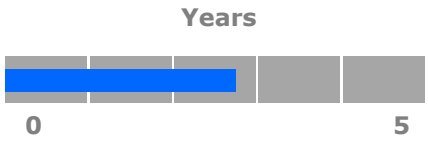
Limited availability of response plans

Limited availability of response plans at the provincial and municipal levels.

Private sector engagement

Little evidence of private sector engagement at regional, provincial and municipal levels.

Table 10. Evaluation Criteria for CDM Recommendations

Recommendations Evaluation Criteria		
Effort		Estimated length of time (in years) to complete the project once it is started.
Complexity	**Low Medium High**	Overall complexity based on the estimated staff time, resources, and collaboration required to complete the project.
Cost	$$$	Estimated annual cost of the project, not including salaries, based on a percentage of the current NDMO annual budget. $ approximates less than 1% of the annual operating budget. $$ approximates between 1% to 10% of annual operating budget. $$$ approximates more than 10% of the annual operating budget.

Good Leadership by Professionally Trained Officials

The basis of successful disaster management centers upon the importance of well-trained professionals. A community or country that has established professionalization of the disaster management field through standardized training and education programs is ensuring a foundation of understanding and leadership among disaster management personnel at all levels.

This aspect of the assessment focused on the availability of training programs, the frequency at which training was conducted and the types and frequencies of exercises at the national level.

Training Programs

Training programs encourage the professionalization of the disaster management field by increasing the availability of qualified staff and disaster managers. This is supported by 76% of survey respondents, who agreed that training improved their ability to effectively perform their job duties and requirements. Surveys also showed that training is widely viewed as a way to increase organizational disaster management capability (see Figure 10).

Figure 10. Response to Question #32 of Survey II, 'How can your organization improve disaster management?'

Archival research, survey results and interviews confirmed that disaster management training is well-integrated into the Dominican Republic's disaster management system. *Ley 147-02* (Article 7) identifies training as one of the functions of the national system for prevention, mitigation and disaster response. According to surveys, 56% of organizations have training programs to help develop and build capacity in disaster management staff members in the Dominican Republic. Although only about half (46%) of survey participants were required to complete disaster management training, over three-quarters (79%) stated that they were provided with opportunities for disaster management training in their current professional roles (**Error! Reference source not found.**). Seventy-nine percent (79%) of survey participants also reported experiencing no barriers to attending disaster management training. These results indicate that an open and inclusive training program for disaster management professionals exists in the Dominican Republic.

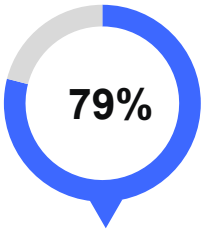


Figure 11. 79% answered YES to Question #3 of Survey I 'In your current position, have you been provided with opportunities for disaster management training?'

Comisión Nacional de Emergencias (CNE) and Defensa Civil operate the *Escuela Nacional de Gestion de Riesgo,* the National Risk Management School, in Santo Domingo. The school has focused on training employees of the central government on responding to disasters. Interviews indicate that CNE is adapting the focus of the school from internal response training to external prevention and mitigation training. Seventy-two training themes are currently in development, with the goal of decentralizing training over the next five years to facilitate community participation, increase capacity, and promote resilience in the areas of recovery and reconstruction.

The Ministry of Education has developed and implemented an integrated risk awareness curriculum throughout the Dominican school system which seeks to increase risk awareness and reduce vulnerability in the Dominican Republic. This adds to the culture of preparedness and will increase awareness about disaster risk and the capacity of the country to respond to disasters.

Training Frequency

Frequent training allows disaster management personnel to build skills and qualifications and increase their overall capacity in the field. When asked 'In your opinion, what qualities make an effective leader,' (Figure 12) survey respondents identified knowledge as the most important quality. This illustrates an awareness by leaders of the importance of disaster management

training throughout the entire disaster management system. *The Escuela Nacional de Gestion de Riesgo* conducted approximately 150 disaster management courses in 2016, further corroborating that training is an important component of the disaster management system.

However, interviews with staff at CNE and Defensa Civil indicate that there are no disaster management training requirements at national or provincial levels. Without an established baseline of required training courses, CNE cannot establish minimum qualifications for disaster management personnel or ensure that all personnel have a common understanding of the disaster management system. The lack of minimum training standards could result in a lack of foundational knowledge and less efficient preparedness and response systems.

Figure 12. Response to Question #23 of Survey III 'In your opinion, what qualities make an effective leader?'

Exercise Programs and Frequency

Regular exercises allow the entire disaster management system to evaluate their capacity for managing disasters and to identify areas for improving capabilities. The *Actualización del Plan Nacional de Emergencias (National Emergency Plan Update)* states "[t]he plan must be activated at least once a year in the form of practical exercises and simulations in such a way as to provide operational experience, control and practice to those individuals who

have the responsibility to take emergency action" (paragraph 7.4.3). The *Plan Nacional* further states that institutional (ministry-level) staffs should participate in drills that include the "participants mak[ing] decisions and mobiliz[ing] resources actually available" (paragraph 7.4.4), promoting the use of full-scale exercises. Additionally, CNE and Defensa Civil are "responsible for planning and organizing the inter-institutional drills periodically to maintain the level of preparation" (paragraph 7.4.4).

Exercises occur at the national and subnational level on a regular basis. Stakeholder interviews with CNE and the Ministerio de Obras Públicas y Comunicaciones (MOPC) identified the existence of a national exercise program and a requirement for two functional simulation exercises per year focused on COE operations. Those interviewed shared that, typically, one of the functional exercises is cancelled each year due to the occurrence of actual disaster events. National exercises take place at the COE and include all CNE member agencies and other disaster partners with liaisons in the COE. During the exercises, some institutions (such as MOPC) activate their internal emergency response structures, while others (such as Policía Nacional) participate solely through their liaison officer at the COE. Several provincial PMR committees also participate in the national simulation exercises. Regional offices of national institutions are represented on the provincial and municipal PMR committees and participate through these committees.

> "I want to stress the importance of exercises. Just before the Haiti earthquake we had conducted an 8.0 earthquake simulation – I believe that contributed to how quickly and efficiently we performed during the disaster and it led us to create three collapsed structure teams."
>
> *Ing. Maria E. Solano, Ministry of Public Works and Communications*

National simulations are focused solely on operations within the COE and do not include any activities in the field. National or ministry-level full-scale exercises are not conducted in accordance with paragraph 7.4.4 of the *Plan Nacional*, resulting in missed opportunities to fully train the decision-making and response coordination structures of the disaster management system and to fully test plans and SOPs.

Stakeholder interviews indicate that inter-institutional drills are not conducted in accordance with the *Plan Nacional*, hindering coordination between government ministries. Several ministries, however, conduct internal drills focused on specific hazards and teams (such as HAZMAT response) and other organizations (including provincial and municipal PMR Committees and Cruz Roja Dominicana) report conducting their own simulations and drills.

Successes

Inclusive training program

The Dominican Republic fosters an open and inclusive training program for disaster management professionals.

National Risk Management School

CNE operates the National Risk Management School and training is generally available to disaster management personnel at the national level.

Enhanced curriculum

The National Risk Management School is enhancing curriculum to remain relevant and meet perceived needs.

Risk awareness curriculum

The Ministry of Education has developed and implemented an integrated risk awareness curriculum throughout the Dominican school system.

National level exercises occur on a regular basis

CNE regularly conducts national-level exercises at the COE and invites all COE members to participate.

Challenges Identified

Staff Training Requirements

The lack of disaster management training requirements at the national and provincial levels could result in a lack of foundational knowledge for disaster management personnel in the Dominican Republic.

Full-scale exercises are not conducted

While national-level exercises are conducted within the COE, full-scale exercises are not conducted in accordance with requirements in Paragraph 7.4.4 in the *Actualización del Plan Nacional de Emergencias*, limiting opportunities to train disaster management personnel and test response plans.

Inter-institutional drills are not conducted

Inter-institutional drills are not conducted in accordance with requirements Paragraph 7.4.4 in the *Actualización del Plan Nacional de Emergencias* which hinders coordination between government ministries.

Recommendations

01

Establish training requirements

Establish minimum training requirements for disaster management staff at all administrative levels (Impact: Moderate).

Methodology / Resources. Training requirements could include: basic knowledge of laws and regulations; the disaster management system; basic and advanced EOC operations; information management; basic and advanced disaster management. Sources for training courses include the IFRC, Salvation Army, USAID/OFDA, US Federal Emergency Management Agency, regional organizations such as ASEAN, and many national disaster management offices.

Effort:

Complexity: Simple

Cost: $

02

Conduct full-scale exercises

Work with partners to develop resourcing and conduct periodic national full-scale exercises to test the capabilities of the COE staff (Impact: Significant).

Methodology / Resources. Due to the resources and staff support required to plan for and execute full-scale exercises (FSEs), PDC recommends that FSEs occur only once every 3 or 4 years. It is further recommended that a national exercise program be implemented that includes a cycle of tabletop exercises (TTXs), functional exercises (FEs) and full-scale exercises, ensuring that basic skills are established and built

upon each year of the cycle. Organizations that have developed cyclical exercise programs include the Hawaii Emergency Management Agency and the US Federal Emergency Management Agency. Assistance with developing national exercise programs can be requested through UNOCHA and USAID.

Effort:

Complexity: Complex

Cost: $$

03

Conduct inter-institutional drills

Develop and implement a plan to conduct inter-institutional drills in accordance with requirements in the *Plan Nacional de Gestión de Riesgos* (Impact: Moderate).

Methodology / Resources. Establish a schedule of inter-institutional drills that engages each ministry at least once every 3 years, and requires the participation of two or more ministries or institutions.

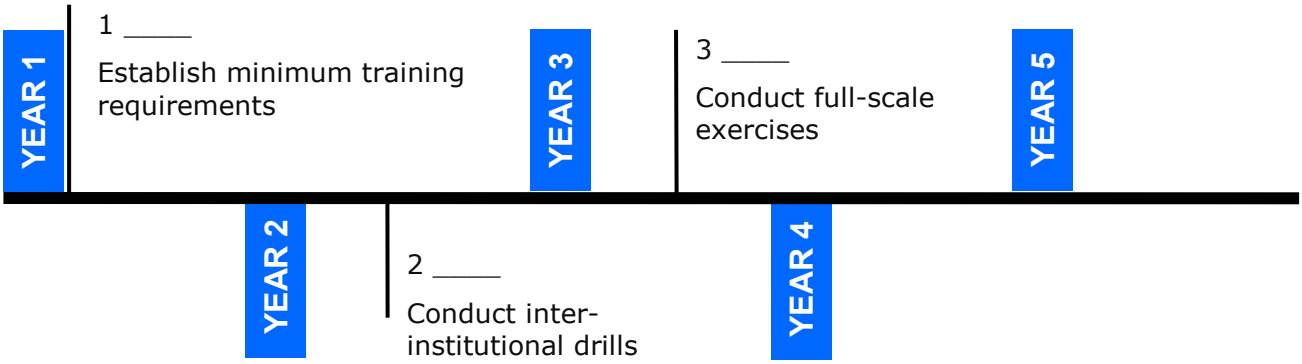
Effort:

Complexity: Complex

Cost: $$

Five-Year Plan

Based on a review of the recommendations against four criteria, a suggested timeline for the implementation of recommendations is provided below with the understanding that country stakeholders will further prioritize based on these, and other criteria.


YEAR 1
1 _____
Establish minimum training requirements
YEAR 2
2 _____
Conduct inter-institutional drills
YEAR 3
3 _____
Conduct full-scale exercises
YEAR 4
YEAR 5

Foundation of Supportive Values for Government Action

More than good leadership by well-trained professionals is required for effective and efficient disaster management. A foundation of supportive values for government action is an essential component, which enables concepts to be developed into policies and provides government leaders the backing to spend money to obtain necessary resources. This is critical for communities and countries with a limited economic base. Disaster preparedness is only one of many issues a government may face. Government support must be encouraged to ensure that the proper importance is placed on disaster management mitigation and preparedness in an effort to build disaster resilient communities with a focus on saving lives and reducing disaster losses.

The Foundation of Supportive Values for Government Action was explored by reviewing the annual operational budget for CNE and Defensa Civil, the availability of a disaster reserve fund for use in disaster response and disaster recovery, and the access disaster managers have to the political apparatus of the nation.

Annual Budget

A budget of 121 million Dominican Pesos (DOP) (USD2.5M) is appropriated annually for the operational needs of CNE and Defensa Civil. CNE receives DOP30 million from this budget, and Defensa Civil is allocated the remaining DOP91 million for its disaster management operations. Only nine percent (9%) of those surveyed consider the budget to be adequate to meet disaster management requirements for the country.

Defensa Civil's annual appropriation is for all operational needs, including facilities, equipment and personnel. The budget pays for 421 paid staff, which are augmented by 8,000 active volunteers. Based on a population of just over 10 million people for the country, this equates to more than 83 trained disaster management personnel per 100,000 people. This indicates a very strong foundation of support for disaster management within the Dominican Republic.

Survey results reveal that 36% of respondents' organizations have dedicated budgets for disaster preparedness and 44% have budgets for disaster response. However, only thirteen percent (13%) of survey participants stated that these budgets were adequate for the last disaster response their organizations conducted, indicating a widespread perception that resourcing for the disaster management system is inadequate. Stakeholder interviews reveal that disaster response and recovery operations are funded by the Budget Division of the Treasury, which redirects normal operating funds from government institutions, thereby impacting their day-to-day operations.

According to those interviewed, despite the requirement for provincial and municipal governments to fund their respective PMR committees, limited resources at those levels results in Defensa Civil covering expenses such as electricity and other administrative requirements.

Research, interviews and survey results support indications that the country's disaster management funding and resources are limited, resulting in resource and capacity-building shortfalls at all administrative levels.

National Disaster Fund

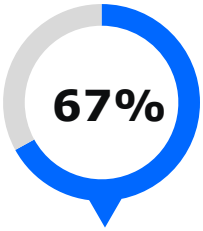


Figure 13. 67% answered NO to Question #18 of Survey I 'In your opinion, is the National Disaster Fund adequate to respond to a major disaster?'

In addition to the operating budget addressed above, the Dominican Republic has a national disaster reserve fund, the Fondo Nacional de Prevención, Mitigación y Respuesta ante Desastres (Fondo Nacional). Two-thirds of survey respondents were of the opinion that the Fondo Nacional is inadequate to respond to a major disaster event (see Figure 13).

Stakeholder interviews indicate that although 5% of the entire national budget is to be allocated to the Fondo Nacional, this allotment is optional for the government, and rarely made. As mentioned above, the Budget Division of the Treasury reallocates funds from all government entities to meet disaster needs. The reallocated funds come from both operational accounts and monies earmarked for infrastructure projects. As a result, the lack of disaster reserve funding impacts both the day-to-day operations of the government and long-term development by diverting funding to meet disaster needs, resulting in long-term infrastructure capacity shortfalls.

Currently the Fondo Nacional can only accept funding from appropriated sources, restricting the flexibility of the government to identify alternative funding sources to support disaster response and relief operations. According

to interviews, CNE is instituting a change to *Ley 147-02* which would allow the Fondo Nacional to accept funding from alternative sources, including gas station licensing fees and INGO fees. This is a positive step toward reducing reliance on the redirection of operational funds to cover disaster costs.

According to stakeholders, the Dominican Republic does not participate in any disaster risk transfer programs. Risk transfer is "the process of formally or informally shifting the financial consequences of particular risks from one party to another" (UNISDR). Risk transfer mechanisms include disaster insurance and reinsurance programs, catastrophe bonds and contingent credit facilities. The lack of participation in a risk transfer program exposes the Dominican Republic to the full financial impacts of disasters.

Appointed/Cabinet-level Position

The President of CNE, who also serves as the Director of Defensa Civil, is appointed by the President of the Republic and has direct access to the head of state when needed. Provincial disaster managers are Defensa Civil employees with direct access to the provincial governors, the mayors of the municipalities, and all PMR committees at municipal and local levels. This ensures that disaster managers have access to political leadership when needed, enabling quick decision-making if necessary. There are no experiential or training requirements for either the President of CNE or the regional or provincial disaster managers. This could result in untrained and inexperienced personnel leading disaster response activities.

Successes

Annual appropriation

Funding is appropriated annually for the operational needs of CNE and Defensa Civil.

Culture of volunteerism

Paid staff of Defensa Civil is augmented by over 8,000 active volunteers, evidence of a strong spirit of volunteerism that greatly contributes to the country's culture of preparedness.

National disaster fund

The Dominican Republic has established a national disaster fund.

Cabinet-level access

The President of CNE is appointed by the President of the Dominican Republic and has access when needed.

Challenges Identified

Resource and capacity-building shortfalls

Disaster management funding and resources are limited, resulting in resource and capacity-building shortfalls at all administrative levels.

Disaster reserve funding shortfalls

Although there is a disaster reserve fund, the fund is insufficient to cover both the day-to-day operations of the government and long-term development goals, resulting in capacity shortfalls.

Lack of a risk transfer mechanism

The lack of a risk transfer mechanism exposes the Dominican Republic to the full financial impacts of disasters.

Recommendations

01

Increase resourcing at national, provincial and municipal levels

Work with partners to develop alternative methods to increase resources at the national, provincial, and municipal levels (Impact: Significant).

Methodology / Resources. Alternative methods could include: developing a program to identify and use college interns; and developing grant proposals for foreign government or International Non-Government Organizations (INGO) funding.

Effort:

Complexity:
Complex

Cost: $$$

02

Increase resourcing to the *Fondo Nacional*

Work with national and international partners to identify alternative sources to increase appropriations to the Fondo Nacional de Prevención, Mitigación y Respuesta ante Desastres to the point that it can cover all disaster expenses incurred each year based on a 20-year disaster loss average (Impact: Moderate).

Methodology / Resources. Alternative sources are being explored through legislation to include licensing fees for gas stations and INGO fees. Other sources could include: adding a tax to each property insurance policy issued; additional fees for development / building permits in higher-risk areas; and increasing the tourist visa fee, earmarking the proceeds for the Fondo Nacional. COPECO in Honduras could provide insight into additional sources of revenue.

Effort:

Complexity: Complex

Cost: **$$$**

03

Explore risk transfer mechanisms

Explore and consider implementing or joining a risk transfer mechanism such as insurance, catastrophe bond or contingent credit facility (Impact: Moderate).

Methodology / Resources. Assistance with implementing risk transfer mechanisms can be provided by the IDB, the World Bank, and the International Monetary Fund.

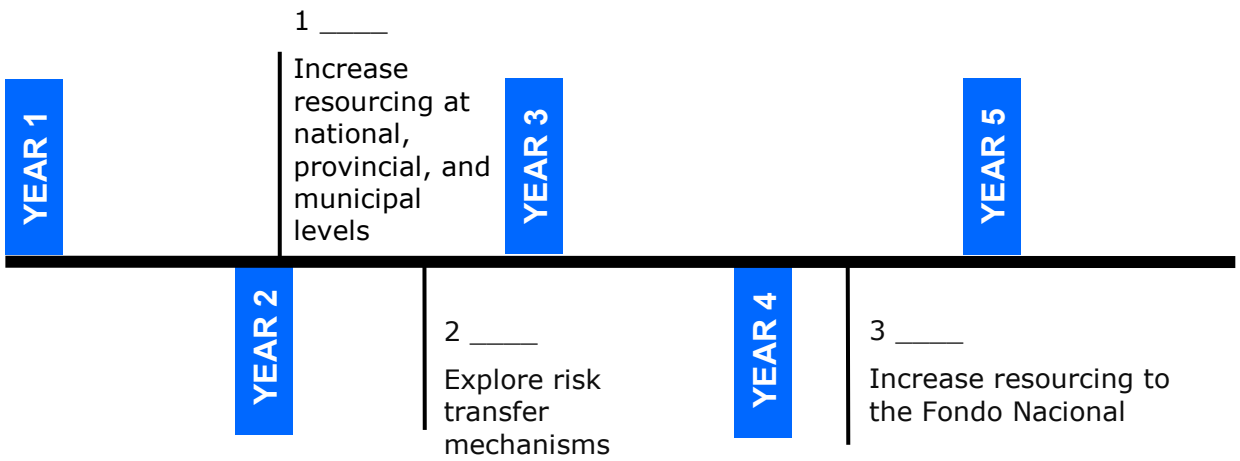
Effort:

Complexity: Medium

Cost: **$$$**

Five-Year Plan

Based on a review of the recommendations against four criteria (level of effort, difficulty, cost, and impact, a suggested timeline for the implementation of recommendations is provided below with the understanding that country stakeholders will further prioritize based on these, and other criteria.


1 _____
Increase resourcing at national, provincial, and municipal levels
YEAR 1
YEAR 2
YEAR 3
YEAR 4
YEAR 5
2 _____
Explore risk transfer mechanisms
3 _____
Increase resourcing to the Fondo Nacional

Legal Authority to Act

Legal authority to act provides the necessary foundation for implementation of CDM. The legal framework within which disaster operations occur has a significant impact on preparedness, response, recovery and mitigation. Without the authority to act and the support of government officials, CDM activities can be halted, leaving residents vulnerable to disasters.

The legal authority to act is critical for any disaster management system since it forms the foundation for developing and implementing the system and enforcing requirements. Indicators used to explore this aspect of CDM in the Dominican Republic included existing disaster management legislation, authorities, roles and responsibilities of disaster management actors, the availability and accessibility of disaster plans and Standard Operating Procedures (SOPs), and the frequency at which plans and SOPs are updated.

Disaster Management Legislation

Ley 147-02 instituted the Sistema Nacional de Prevención, Mitigación y Respuesta ante Desastres (SN-PMRD) (National System for Prevention, Mitigation and Disaster Response) under which disaster management is organized within the Dominican Republic. *Ley 147-02* also established the *Plan Nacional de Gestión de Riesgos*, the *Actualización del Plan Nacional de Emergencias*, the *Sistema Integrado Nacional de Información*, and the *Fondo Nacional de Prevención, Mitigación y Respuesta ante Desastres* as implementation tools of the disaster management system. The coordination structure established in *Ley 147-02* includes the Consejo Nacional de Prevención, Mitigación y Respuesta a Desastres, the Comisión Nacional de Emergencias (CNE – which includes the Centro de Operaciones de Emergencias – COE), and PMR Committees at regional, provincial, and municipal levels.

Ley 147-02 grants general powers to the President of the Republic to issue administrative rules and regulations in the areas of fiscal and contract controls, donated goods, acquisition and expropriation of property, and refinancing public debt. However, it does not provide explicit disaster management powers to the President or other government officials to be used during declared disasters or emergencies (i.e. the authority to order mandatory evacuations, or to set aside certain laws that might impede disaster response).

Ley 147-02 identifies members of CNE and the COE by organization, but is more general with the membership of regional, provincial, and municipal PMR Committees. According to interviews and other research, the current national system provides a higher level of disaster management coordination than the structure in place prior to the enactment of *Ley 147-02* – lowering response time in the wake of disaster events, saving financial resources, and increasing the overall effectiveness of disaster management in the country.

While advancements at the national level have been significant, stakeholders conveyed that there is a lack of participation and engagement in the disaster management system at provincial, municipal and community levels. This was validated by survey responses, with 61% of survey participants expressing that existing disaster risk reduction laws are not being adequately implemented at the subnational level. These findings indicate a lack of support for disaster management at the provincial and municipal level, resulting in a lack of capacity and capability at these levels.

Designated Authorities

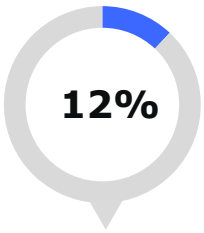


Figure 14. 12% answered YES to Question #12 of Survey I 'Do you feel that the existing disaster risk reduction laws are being adequately implemented at the local level?"

Clarity regarding roles and responsibilities for all stakeholders engaged in a country's disaster management system is essential to minimize duplication of effort, and maximize the utilization of limited resources. Stakeholders conveyed in both interviews and surveys that they consider disaster management to be functional at the national level, but that resource and capacity shortfalls weaken regional, provincial and municipal level disaster management capabilities.

Ley 147-02 establishes the authority for disaster management throughout the country, instituting a hierarchical system of prevention, mitigation, and response at all administrative levels of government. However, one stakeholder interviewed stated that certain municipalities are not following the requirements of *Ley 147-02*, resulting in a weakened disaster management system. This statement was validated by survey results, with just over 10% of respondents agreeing that disaster risk reduction laws are being adequately implemented at the sub-national level.

Ley 147-02 envisions a layered disaster response system that starts at the community level, with each level of government acting on its own authority within the system. However, the law does not provide authority for a community-level disaster management coordination mechanism (such as a

local PMR Committee), resulting in little capacity and delayed response efforts at the community level.

During a disaster, incident command is initially established at the community or municipal level. When resources at each level are overwhelmed, incident command moves to the next administrative level (from municipal to provincial to regional and finally to the national level). Interviews indicate that, with limited capacity and few resources at municipal and community levels, incident command over anything larger than a very localized emergency begins at the provincial level and rapidly migrates upward, resulting in the COE often coordinating and directing response operations for relatively minor emergencies. This rapid centralization of incident command results in a less efficient response.

"Institutions are not supposed to improvise – they all know the plan and their roles within the plan."

Provincial Disaster Manager

According to stakeholders, disaster managers below the national level are expected to respond strictly within the confines of the procedures established in the *Actualización del Plan Nacional de Emergencias* and provincial or municipal plans, and implement the directives issued from the COE without any room for adaptation based on local conditions or circumstances. This could result in response efforts that are either slowed by centralization (as disaster managers wait for direction) or inappropriate for the situation.

Together, the lack of legal authority at the community level, and resources and capacity at municipal and provincial levels, result in a centralized and directive disaster management system. Although centralization can create efficiencies, it can also result in delayed or inappropriate response actions and a loss of participation and support.

Figure 15. Regional Defensa Civil office in Barahona, Barahona Province, the Dominican Republic

Disaster Management Documentation Availability

The coordination of disaster activities across a broad range of partner organizations is most successful when partners are encouraged to engage throughout the planning process, from the initial drafting of plans to the sharing of relevant plans between organizations.

Disaster management documentation helps guide inter-agency cooperation and coordination throughout all phases of the disaster management process. The availability of, and access to, disaster management documentation is a key indicator for how effectively preparedness and response operations will function in the event of a disaster. The Dominican Republic has a highly integrated set of disaster management plans at the national level and many plans are available on-line. In collaboration with various international partners, Defensa Civil has published disaster planning guides for different levels of government and for various institutions. Over three-quarters (78%) of survey respondents indicated that their organization had a comprehensive disaster management plan, with similar numbers having preparedness, response and mitigation plans and somewhat fewer having recovery plans. As most of the respondents to this survey represented organizations from the central government, this indicates a high level of planning at the national level. However, 56% also reported they do not have copies of their organization's disaster management plans, indicating a lack of familiarity with the intricacies of their organizations' roles in disaster management.

The Ministerio de Educacion República Dominicana (MINERD) has produced an extensive series of response plans for each of their administrative levels, from

national complexes to education centers and schools. MINERD has also produced an integrated risk management curriculum for the primary school system, complete with teacher and student guides. This is a best practice and indicates an investment in establishing a culture of preparedness throughout the Dominican Republic.

Figure 16. Availability and accessibility of disaster plans according to Survey II results

The *Actualización del Plan Nacional de Emergencias* (*Plan Nacional*) requires institutions (ministries) to create their own plans based on the *Plan Nacional* (paragraph 7.2.3). Stakeholder interviews indicated that at least one institution does not have their own disaster plan or access to a copy of the *Plan Nacional*, weakening the cohesiveness of the disaster response system.

Survey results indicate that not all disaster plans are comprehensive in nature, with only 60% reporting that their plans cover all hazard types (see Table 11), resulting in gaps in planning at the national level. A key deficiency in this area is recovery planning, with only 34% reporting that their plans incorporate long-term community recovery. Research shows that the lack of pre-disaster recovery planning results in very slow recovery for communities impacted by disasters. The lack of long-term recovery planning could lead to extended periods of resource diversion and slow growth for the entire country following a major disaster.

Table 11. Frequency of responses to questions regarding specific elements of disaster management plans (45 respondents) according to Survey II

Does plan include information on:	Yes	No	Other*
	%	%	%
All hazard types	***60***	***25***	***15***

Does plan include information on:	Yes	No	Other*
	%	%	%
Public outreach	51	38	11
Early warning	47	36	17
Evacuation	62	29	9
Logistics	62	25	13
Shelter operations	58	27	15
EOC activation	38	49	13
Separate SOP for EOC activation	67	25	8
Transportation	51	23	26
Communications	51	34	15
Public works and engineering	54	31	15
Public health and medical services	25	60	15
Search and rescue	42	38	20
Hazardous materials	45	42	13
Agricultural and natural resources	34	58	8
Public safety	25	51	24
Long-term community recovery	*34*	*49*	*17*

*Other category includes "I Do Not Know", "Does Not Apply" and missing answers

Interviews with stakeholders highlighted that few organizations share their disaster plans. This is supported by survey results which showed that only 44% of organizations have shared their disaster management plans with other agencies or organizations active in disaster management. This could lead to less than optimal collaboration between agencies and result in slow or ineffective response and recovery operations.

The *Plan Nacional* states that provinces, municipalities, and NGOs "have the responsibility of preparing their plans." Provincial and municipal disaster

response plans are generally lacking, with research and interviews indicating that only three (out of 31) provinces and 45 (out of 125) municipalities have plans in place. A lack of, or inadequate planning contributes to provinces and municipalities being inadequately prepared to respond to emergencies and disasters. Defensa Civil maintains a central repository of provincial, and municipal plans to ensure rapid access to them by the COE if needed.

Documentation / SOP Update Frequency

Effective disaster management is dependent upon the entire disaster management community working together to develop, revise, practice and execute disaster plans in a coordinated manner.

Stakeholder interviews indicated that there are no national standards for updating plans or SOPs, and one ministerial plan was last updated in 1985. Only 22% of respondents to surveys reported updating their plans regularly, although 42% routinely test their plans. Just over half of survey participants stated that SOPs are reviewed and updated at least every two years (see Figure 17). These data indicate that disaster plans and SOPs are not updated on a regular basis, missing an opportunity to incorporate best practices and lessons learned into disaster planning.

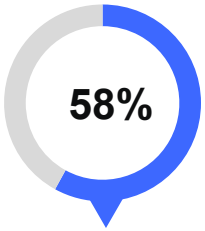


Figure 17. 58% update their SOPS at least every two years, according to responses for Question #29 of Survey II.

As ministerial plans are updated, they are submitted to the PMR Technical Committee for review to ensure standardization and alignment with the *Plan Nacional*.

Ley 147-02 was last updated in 2009, and the National SOPs were updated in 2013. The *Plan Nacional de Gestión de Riesgos* was last updated in January 2011 and is updated every four years. Both the *Plan Nacional de Gestión de Riesgos* and the *Plan Nacional de Emergencias* are currently under revision. By frequently reviewing and revising their national-level laws, plans and SOPs, the Dominican Republic ensures that they incorporate the latest advances and lessons learned.

Successes

Ley 147-02

Ley 147-02 (the country's disaster management law) establishes the response system and roles and responsibilities from the national level down to the municipal level and is regularly reviewed and updated.

Highly integrated disaster preparedness and response plans

Disaster preparedness and response plans are highly integrated at the national level and facilitate both intra-governmental response actions and close collaboration between the government and NGOs.

National disaster plan guidelines

National guidelines have been established for provincial and municipal disaster plans.

Challenges Identified

Community-level disaster coordination mechanisms

Ley 147-02 does not provide community-level disaster management coordination or implementation mechanisms, resulting in delayed response at the local level.

Ley 147-02 not fully implemented

Some municipalities are not fully implementing *Ley 147-02*, reducing the effectiveness of the disaster management system.

Lack of institution-level disaster plans

At least one institution does not have their own disaster plan or access to a copy of the *Plan Nacional*, weakening the cohesiveness of the disaster response system.

Recovery planning

Not all organizations have incorporated recovery planning into their disaster plans. The lack of long-term recovery planning

could lead to extended periods of resource diversion and slow growth for the entire country following a major disaster.

Lack of provincial and municipal disaster plans

Provincial and municipal generally lack disaster response plans, with only 3 of 31 provinces and 45 of 125 municipalities having plans.

No established plan or SOP update interval

No national standard is established for reviewing and updating plans and SOPs / protocols and some plans have not been regularly updated.

Recommendations

01

Community response organizations

Determine the need for formal community response organizations and, if needed, add the requirement to Ley *147-02* (Impact: Significant).

Methodology / Resources. Conduct a review of the disaster management system and the role of the local PMR committee to determine if there are gaps in needed capabilities. If gaps are identified, develop a plan to create legislation and identify needed resources.

Effort:

Complexity: Medium

Cost: $

02

Socialize *Ley 147-02*

Develop a program to provide training to the mayors and local community representatives on the requirements of *Ley 147-02*, and follow up with assistance visits to ensure they are meeting the requirements of the law (Impact: Moderate).

Methodology / Resources. Develop and deliver a training course on the requirements of Ley 147-02 to all mayors and local community representatives. Conduct visits to each municipality to identify shortfalls against the requirements. Develop and implement a strategy to meet the shortfalls in each municipality.

Effort:

Complexity: Simple

Cost: $

03

Ministry disaster plans

Identify ministries without disaster plans and establish a strategy to assist them with completing required plans (Impact: Minor).

Methodology / Resources. Develop a plan to review all ministry disaster plans, identify those without plans or with outdated or insufficient plans, and provide support to complete the required plans.

Effort:

Complexity: Simple

Cost: $

04

Complete recovery plans

Identify organizations that have not developed recovery plans and work with partners and the international community to complete recovery plans (Impact: Significant).

Methodology / Resources. Develop a program to train ministries, provinces and municipalities on recovery planning and implement the recovery planning process. UNISDR's Guidance Note on Pre-Disaster Recovery Planning and PDC/ASEAN's Disaster Recovery Training Course could provide a foundation for successfully developing recovery plans.

Effort:

Complexity: Complex

Cost: $$

05

Province and municipal disaster plans

Identify provinces and municipalities without disaster plans and work with partners and the international community to identify resources to assist with completing required plans (Impact: Moderate).

Methodology / Resources. Develop a program to identify the provinces and municipalities without disaster plans, identify the resources needed to develop the missing disaster plans, and assist with completing them in accordance with the guidelines established by CNE and Defensa Civil.

Effort:

Complexity: Medium

Cost: $$

06

Plan and SOP update requirements

Develop and promulgate minimum requirements for updating plans and SOPs. (Impact: Minor)

Methodology / Resources. Recommended intervals: review and update plans after each major disaster or at least every five years; review and update SOPs at the beginning of each hurricane season.

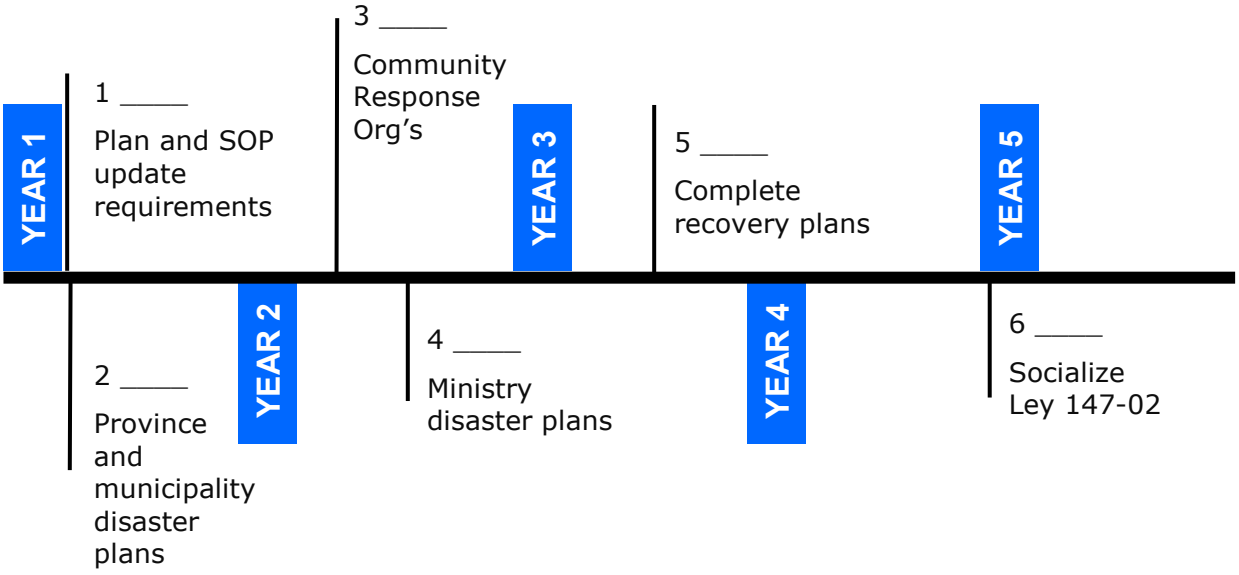
Effort:

Complexity: Simple

Cost: $

Five-Year Plan

Based on a review of the recommendations against four criteria (level of effort, difficulty, cost, and impact, a suggested timeline for the implementation of recommendations is provided below with the understanding that country stakeholders will further prioritize based on these, and other criteria.


YEAR 1
1 _____
Plan and SOP update requirements
YEAR 2
2 _____
Province and municipality disaster plans
YEAR 3
3 _____
Community Response Org's
4 _____
Ministry disaster plans
YEAR 4
5 _____
Complete recovery plans
YEAR 5
6 _____
Socialize Ley 147-02

Advocacy Supporting Action

Advocacy supporting action is necessary to ensure that disaster management policies are implemented nation-wide. The backing of political leaders is not always enough to ensure that hazard policies are implemented. Successful disaster management requires strong stakeholder support across all levels. Following a disaster, stakeholder support for action is generally high and may play a key role in hazard policy implementation. Stakeholders include traditional and non-traditional partners involving the general public, non-governmental organizations, academic institutions, the private sector, and those providing assistance before, during and after a disaster.

Advocacy supporting action explores the entire community's involvement in the disaster management system. The assessment considered recent disaster events, the disaster declaration process, recent or pending changes to disaster management legislation, the activities of NGO partners, cooperation with the private sector and local community empowerment.

Recent Disaster Events

An organization's ability to respond adequately to a disaster event is indicative of the broader commitment to, and support for, disaster management activities by communities and the government. Communities recently impacted by major disaster events are generally more supportive of disaster risk reduction initiatives. Stakeholder interviews indicate that the last major disaster declaration in the Dominican Republic was for Hurricane Matthew in October 2016 (see Figure 18). Surveys conducted prior to Hurricane Matthew show that 53% of respondents felt the national response to the last major disaster was effective. Fifty percent (50%) felt that disaster alert/warning messages were issued effectively during the last disaster, and 47% felt that the mobilization of resources and response personnel was effective during the last disaster. Those interviewed stated that the national response system generally functioned well during disasters ranging from Hurricane Matthew and the Haiti earthquake to small- and medium-scale flooding. Despite the resource constraints of the Dominican Republic, survey data and interviews indicate that the disaster management system functions effectively.

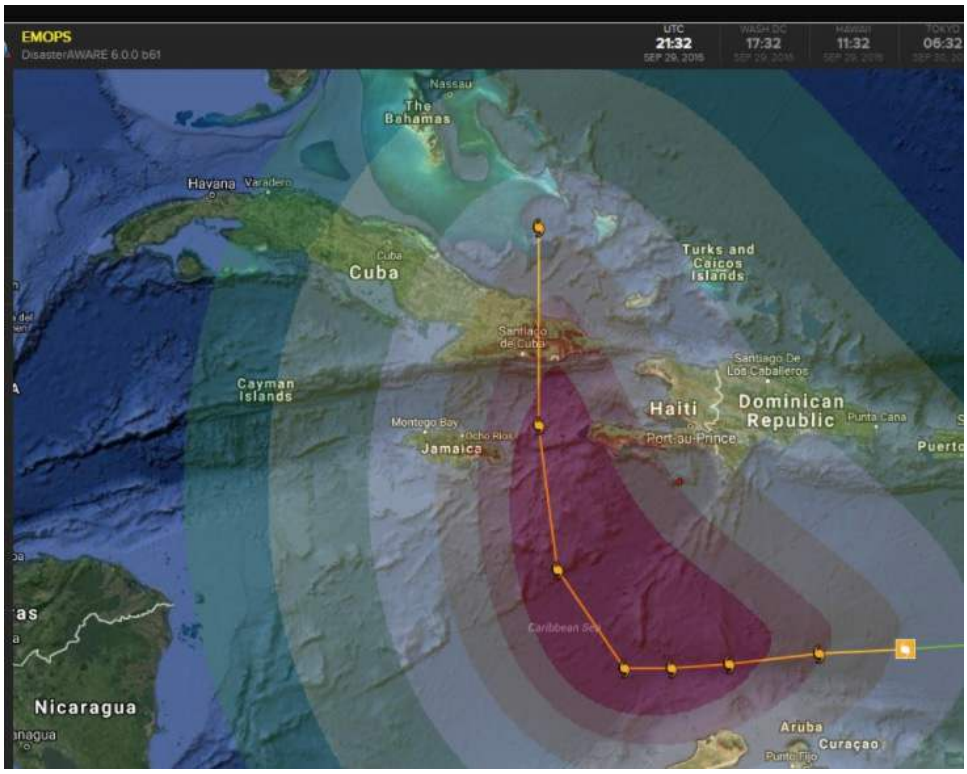


Figure 18. Projected track of Hurricane Matthew, 29 September 2016 ©Pacific Disaster Center

Disaster Declarations

According to *Ley 147-02*, only the President of the Dominican Republic can make a disaster declaration. This was validated by interviews conducted with government officials at all administrative levels. The declaration is made based on the recommendation of CNE and is classified as one of four types based on the affected areas:

- National – when a disaster is imminent or impacts or exceeds the technical capacities and administrative resources of three or more provinces;
- Regional – when a disaster impacts or exceeds the resources and technical capacities of two or more provinces;
- Provincial – when a disaster impacts or exceeds the resources and technical capacities of two or more municipalities; and
- Municipal – when a disaster impacts or exceeds the resources and technical capacity of a single municipality.

Disaster declaration requests typically begin at the municipal level and escalate, with each level of government asking the next level for a disaster declaration. However, in certain instances a Mayor (municipal level) can send

a disaster declaration request directly to the President of CNE. Disaster declarations must be supported by the submission of damage assessments which are collected, consolidated, and processed through the PMR Committees at each level. Stakeholder interviews indicated that the disaster declaration process is clearly understood by all government officials.

Recent Disaster Legislation

Recent disaster management legislation can provide an indication of whether lawmakers are actively supporting disaster management and DRR. CNE officials stated they are submitting an update to *Ley 147-02* to the legislature. According to stakeholder interviews, CNE consulted all of their partners over a four-year period regarding this update to the country's disaster management legislation. This indicates that CNE has evaluated *Ley 147-02* against the requirements of the disaster management system and identified additional authorities needed to improve the system. CNE's engagement of stakeholders during the process highlights a commitment to collaboration and cooperation. Requests to CNE for a copy of the proposed revisions to the legislation were not met.

Number of NGOs with a Disaster Focus Active in the Country

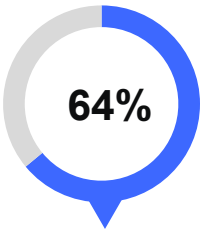


Figure 19. 64% answered YES to Question #21 of Survey I 'In your opinion, are non-government organizations (NGOs) effectively supporting national disaster management goals?'

Effective disaster response requires the participation of multiple agencies and organizations, including non-traditional partners. Almost two-thirds of survey participants (see Figure 19) feel that NGOs are effectively supporting national disaster management goals, while just over half (58%) believe that NGOs are actively engaged in disaster preparedness at the local level. Stakeholder interviews confirm that NGOs are actively engaged in disaster preparedness and response in the Dominican Republic. NGO disaster preparedness support ranges from providing community ambulance services, to conducting disaster preparedness training in local communities, and developing community hazard maps. NGOs are also a key part of disaster response in the Dominican Republic, providing disaster response teams and supplies.

CNE facilitates participation of the international community in disaster risk reduction activities, working with a large assortment of NGOs and projects. There is an NGO Cluster for disaster response, as well as an NGO-specific risk management forum, Foro de Gestion de Riesgos, which allows NGOs the opportunity to fully participate in risk management activities in the country. NGOs actively engaged in the Dominican Republic include the Red Cross, Oxfam, Save the Children, PLAN International, World Vision, and Caritas. Overall, NGOs perform a key role in the disaster management system and are well integrated into preparedness, response and recovery operations.

Figure 20. Cruz Roja Dominicana (Dominican Red Cross – CRD) Ambulances at the CRD Headquarters in Santo Domingo

Cruz Roja Dominicana (CRD – Dominican Red Cross) is the primary disaster management NGO for the country, as well as a key disaster management partner for Defensa Civil. CRD has 235 paid staff and 20,000 volunteers, 177 stations and branches, 4 blood centers, and 17 warehouses. CRD maintains clearly established partnerships with the government, the private sector, and local communities, as well as the nation's 911 support service. Top priorities for CRD include empowering authorities to do appropriate and adequate work in prevention at all levels of government, as well as preparation and training in communities to reduce vulnerability. CRD also engages in contingency planning, mapping (information mapping, vulnerability mapping, and capacity mapping), and the opening and management of shelters during disaster events. CRD has a close relationship with CNE and Defensa Civil, participating in planning activities, exercises and operations. This relationship provides

greater capacity to the disaster management system and a high degree of flexibility in supporting communities stricken by disaster.

Private Sector Engagement

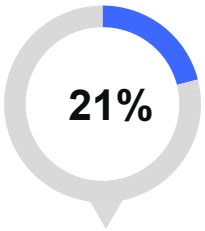


Figure 21. 21% anwered YES to Question #16 of Survey I 'In your opinion, is there strong support of public-private partnerships in disaster management at the local level?'

Ley 147-02 states that membership of the regional, provincial, and municipal PMR Committees will include two members representing civil society who are selected from trade unions, professional associations or the community. There is little evidence that this occurs. Sixty-six percent (66%) of survey respondents state their organizations engage with the private sector to support disaster response, however, only 21% feel there is strong support for public-private partnerships in disaster management at the local level (see Figure 21). As most respondents for the survey represented central government organizations, this could indicate that private sector engagement at the national level is high, but is low at the provincial and municipal levels. There is little evidence that the private sector is involved in disaster management at provincial, municipal or community levels. A lack of private sector engagement in the disaster management system below the national level leads to missed opportunities for cooperation and support, resulting in less efficient response and recovery operations.

Local Community Empowerment

Ley 147-02 envisions a layered disaster response system that starts at the local level. The type of system envisioned by the law requires local actors to have the responsibility, authority and resources to act during emergencies and disasters. However, interviews and survey responses emphasized the lack of local authority and the need to trust and empower local government and strengthen coordination between all levels of government (see Figure 22, below).

The *Plan Nacional de Gestión de Riesgos* calls for "[t]he strengthening of the preparation, the capacity for action, institutional organization and the inter-agency collaboration… at the local level with the support of national entities. It should strengthen the local operating agencies and collaborate with non-governmental organizations (NGOs), the private sector and community organizations." Research and interviews indicate that there is little evidence that local capacity building is occurring. However, the CNE recognized this and the *Escuela Nacional de Gestion de Riesgo* now has a goal of decentralizing

training over the next five years in order to, in part, increase community capacity.

Stakeholders at all levels of government stated that disaster response begins at the community level and is managed by the local PMR Committee. As operational capacity is approached, the local Committee asks the PMR Committee at the next level for assistance. This process is repeated, from municipal, provincial, and regional levels on up to the national level. Since municipal and provincial governments generally do not have the capacity to respond to disasters, the National COE is often activated to respond to small-scale disasters. This results in overly-centralized and inefficient disaster response operations. An increase in the empowerment of municipal and community disaster management authorities is necessary to decentralize the country's disaster management system and improve its efficiency.

Figure 22. Responses to Question #20 of Survey II 'In your opinion, what is your greatest challenge to effective disaster response?'

Successes

Disaster declaration process

The disaster declaration process is clearly understood.

Culture of volunteerism

There is a very strong spirit of volunteerism throughout the country.

NGOs

NGOs are actively involved in the disaster management system and are regularly engaged by CNE and Defensa Civil.

Challenges Identified

Limited private sector engagement

Limited private sector engagement at municipal and local levels results in a less efficient disaster management system.

Lack of capacity

As provincial and municipal governments generally do not have the capacity to respond to disasters, the COE is often activated to respond to small-scale disasters. This results in overly-centralized and inefficient disaster response operations.

Local empowerment

An increase in the empowerment of municipal disaster management authorities is necessary to facilitate the full decentralization of the country’s disaster management system.

Recommendations

01

Encourage private sector engagement

Strengthen *Ley 147-02* to encourage engagement with private sector organizations at the national, provincial, municipal and community levels and include the private sector in all phases of disaster management (Impact: Significant).

Methodology / Resources. Encourage participation in the PMRs at all levels through representation by trade groups such as the Chamber of Commerce or other appropriate organizations. Develop a program to open a dialogue between government and private sector trade groups to determine: what the private sector needs from government; what government needs from the private sector; what each can provide the other; and design a strategy to implement the findings.

Effort:

Complexity: Complex

Cost: $

02

Increase capacity at the provincial, municipal and local levels

Work with private sector and NGO partners to increase capacity at the provincial, municipal and local levels to conduct all disaster management responsibilities (Impact: Significant).

Methodology / Resources. Programs to increase capacity could include: leveraging collaborative relationships to provide additional opportunities for training and exercise participation; adopting standardized training requirements; and providing programs that strengthen local disaster management response capabilities, including community resilience building, developing and rehearsing plans, and response-operations management training. One example of community resilience building is the State of Hawaii's Hawaii Hazards Awareness and Resilience Program (HHARP) available through PDC.

Effort:

Complexity: Complex

Cost: $$

03

Enhance municipal and community empowerment

Work with partners to enhance municipal and community empowerment (Impact: Significant).

Methodology / Resources. Empowerment could come through preparedness activities such as: developing local response plans; strengthening community partnerships; providing preparedness and response training activities; and community hazard mapping.

Effort:

Complexity: Complex

Cost: **$$**

Five-Year Plan

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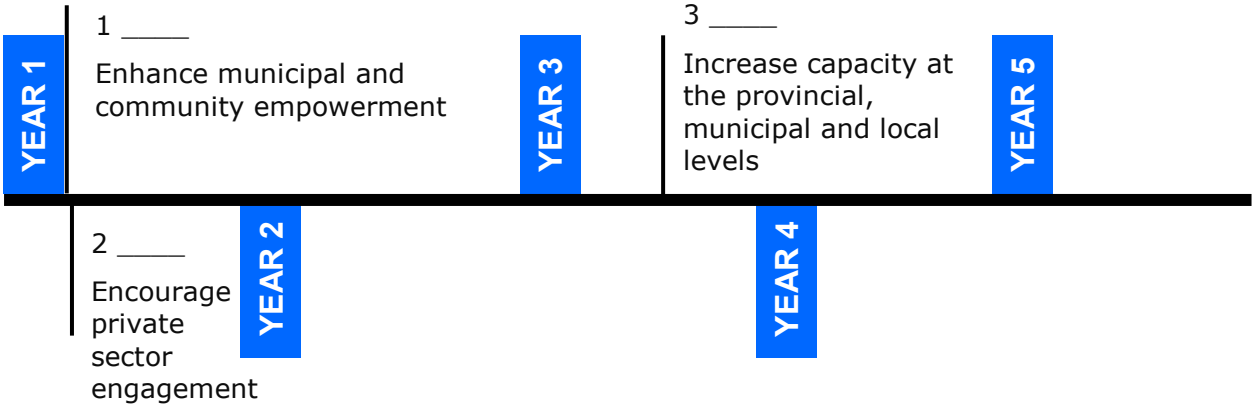


Necessary Institutional Resources

It is critical that every jurisdiction has an accurate assessment of available resources (human and material), and knows the availability of those resources during a disaster. Although a jurisdiction may have a limited economic base and few immediate resources, through mutual-aid agreements with neighboring jurisdictions, resources can be easily mobilized to respond. Being able to quickly assess the community needs and having the knowledge of available resources, aid can be requested in a timely manner to ensure immediate emergency needs are met.

Adequate resourcing for the disaster management system is critical for effective preparedness, response and recovery programs. The assessment for necessary institutional resources considered key components of resourcing, including resources designated for use during disasters, resource inventories, mutual aid agreements and emergency operations centers.

Resources Designated for Disaster Management

Resources designated for disaster management provide an indication that a country has invested in and supports disaster management activities. This can include equipment and personnel assigned to government ministries, specialized disaster response supplies, and shelters.

According to stakeholder interviews with government officials, all government resources are available for use during disaster operations. However, survey participants identify resource shortfalls as a significant challenge to effective disaster response, with only 59% of survey participants stating that their organizations have adequate staffing to conduct disaster response. When asked "what would make disaster response more effective in the Dominican Republic" many recommended an increase in the availability and management of resources. Over half of those surveyed (see Figure 23) state their organizations do not have sufficient inventory to respond to a large-scale disaster, and only 18% feel that government inventory (supplies) are sufficient to respond to a large-scale disaster. This signifies the widespread perception that there are not sufficient resources to support a large-scale disaster. This was contradicted in interviews, where a number of stakeholders

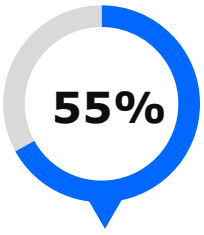


Figure 23. 55% answered NO to Question #10 of Survey I 'In your opinion, does your organization have sufficient inventory to respond to a large-scale disaster?'

at the national and regional level stated that they have never run short of resources during a disaster event, including the Haiti earthquake. This seeming dichotomy could indicate that the government is adept at reallocating resources to ensure disaster needs are met.

Emergency Communications System

The Dominican Republic operates and maintains a nation-wide emergency radio communications system which links the COE with critical partners, including:

- Regional and provincial PMR Committees;
- Cruz Roja Dominicana;
- The Armed Forces;
- Electric companies;
- Policía Nacional;
- Tourist police;
- National Office of Meteorology; and
- The Seismological Institute.

Stakeholder interviews indicate that equipment for the system is in working order and regularly tested, ensuring that the emergency communications system is available throughout the country during disasters.

Shelter System

According to Defensa Civil's shelter operations staff, there are 3,193 shelters nationwide (Figure 24), with greater numbers of shelters in highly populated areas. Shelters are operated by Defensa Civil, the COE, and Cruz Roja Dominicana at the provincial level. The shelter system can accommodate 900,000 people, or about 9% of the nation's population. Defensa Civil annually publishes a list of shelters that have been evaluated against international standards. There is only one purpose-built shelter in the nation, and 80% of shelter spaces are in schools. This creates friction when trying to quickly open schools in the aftermath of a disaster. Shelters are opened upon the request of PMR committees at the municipal or provincial level. Defensa Civil directs the opening of shelters with assistance from:

- The Social Plan of the Presidency – equipping shelters, and providing food;
- Ministry of Health – provides vector control;
- National Institute of Drinking Water and Sewerage – provides water; and
- The armed forces – provides security.

Stakeholders reported that protocols are in place to open shelters, and these are carried out quickly and efficiently to meet the needs of the population before and during disasters.

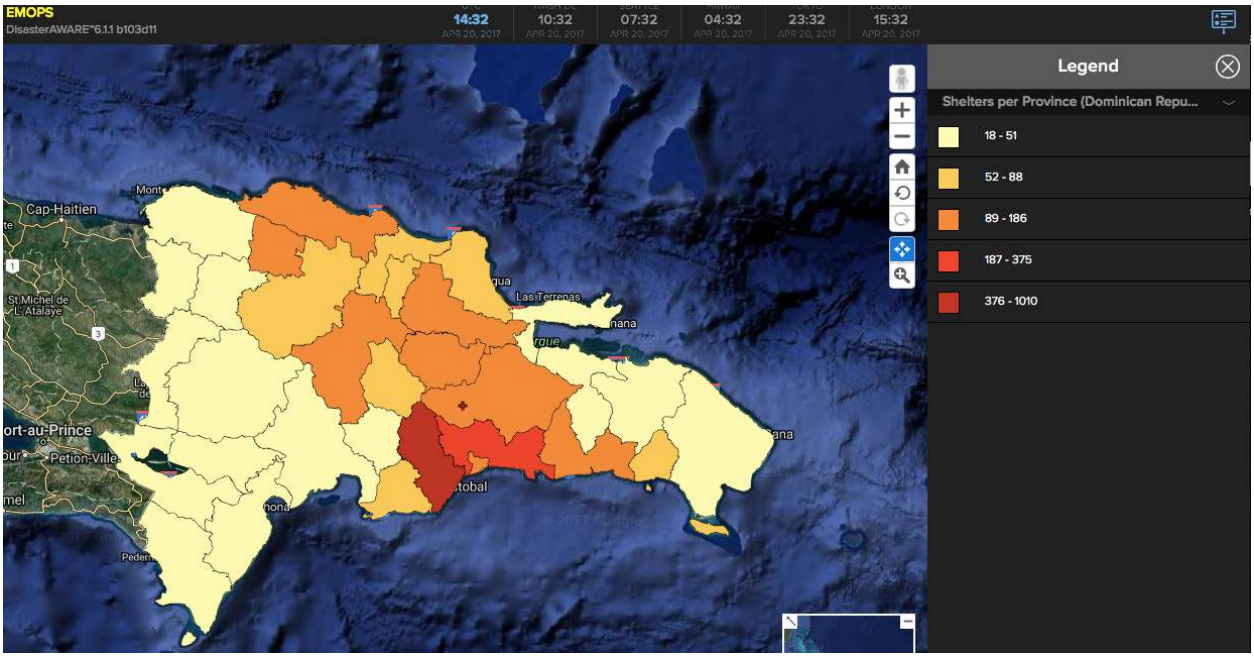


Figure 24. Shelters per province in the Dominican Republic - ©Pacific Disaster Center

Disaster Relief Supplies

Government disaster relief supplies are held by several different agencies. Defensa Civil maintains a central warehouse in Santo Domingo with minimal stocks and relies on other agencies (including the Social Plan of the Presidency) to provide additional supplies. During a site visit, the project team noted that the Defensa Civil warehouse contained roughly three pallets of water, less than two-hundred mattresses, and a minor amount of medicine (Figure 25). Defensa Civil logistics personnel stated that there are warehouses throughout the country where disaster relief supplies are staged during a disaster. The current relief system requires local PMR Committees to assess needs and submit requests through approved channels to the COE. The COE subsequently oversees the collection of supplies from the various organizations and their transportation to the stricken area for distribution. Stakeholders state the current system works well in that they have never run short of supplies and that money is saved by having only a few agencies maintain and rotate relief supplies. However, one interviewee identified the need for local warehouses to store food, water and cots in order to provide resources more quickly during disaster relief operations.

In addition to government disaster relief stores, Cruz Roja Dominicana maintains 14 warehouses across the nation, stocking hygiene and kitchen kits, mosquito nets, and blankets. CRD does not stock or provide food during relief operations. Interviews with CRD personnel indicate that other NGOs have stocks of disaster relief supplies as well, and that they coordinate with one another during disasters to maximize relief efforts.

Figure 25. Minimal disaster supplies are maintained in the Defensa Civil warehouse in Santo Domingo

Inventory of Available Resources

Inventories provide an indication of available resources that can be utilized in the event of a disaster response and must be kept up to date in order to provide an accurate count of resources that are available. The *Actualización del Plan Nacional de Emergencias* (Chapter 5) states that it is necessary to have an inventory of existing disaster management resources at the national level. Resource lists must be kept strictly updated by those responsible for the materials and warehouses that can be utilized in emergency operations. The requirement is for institutions (ministries) to keep updated inventory lists of available resources for emergency operations, and to provide these updated inventory lists to the COE for use as appendices to the *Actualización del Plan Nacional de Emergencias*.

Stakeholder interviews indicate that institutional resource lists are provided to the COE by the first of June every year, and that the lists are maintained as part of the various national contingency plans. However, none of the contingency plans reviewed for this assessment contained resource lists, and requests for copies of resource lists were not met. According to interviews, at least one ministry does not maintain a resource list. Incomplete or outdated inventories could result in critical resource shortfalls during disaster response operations.

Mutual-Aid Agreements

Chapter 1 of *Ley 257*, under which the Oficina Nacional de Defensa Civil was established, authorizes Defensa Civil to sign and implement mutual-aid agreements and receive international aid. Desk research identified references to mutual-aid agreements between the Dominican Republic and neighboring countries, such as Panama and Puerto Rico. According to those surveyed, 55% said that their organizations have mutual-aid agreements in place, and 78% stated that their organizations have pre-established agreements for support during times of disaster. Resources such as equipment, services, and supplies are provided through these agreements with international agencies, state institutions and the private sector.

There are no formal mutual-aid agreements in place between PMR Committees for resource sharing prior to, during, or after a disaster event. This lack of formalized agreement to share resources limits the flexibility of the disaster response system, although it must be noted that most municipalities have very few resources to share.

Emergency Operations Centers

Having a dedicated location from which to conduct disaster response operations allows for more successful and comprehensive disaster management at national and subnational levels. There is only one designated Emergency Operations Center in the Dominican Republic, the EOC at the Defensa Civil compound in Santo Domingo. All other disaster coordination centers are called *salas*, or situation rooms.

Ley 147-02 establishes the EOC as the preparedness and response coordinating agency for the nation. Led by Defensa Civil, the Secretary of State for the Armed Forces, and the Santo Domingo Fire Brigade, the EOC is a sole-purpose, 24/7 facility. The EOC has equipment and supplies, including computers, to operate for at least 72 hours during a disaster event. The EOC has backup power, food, and water to last for up to ten days. The alternate EOC is the Armed Forces Joint Command Center.

Figure 26. Entrance to the COE in the Defensa Civil compound in Santo Domingo

Ley 147-02 directs twenty-two organizations to provide permanent representatives to the EOC, although stakeholder interviews indicate that thirty institutions send representatives to the EOC when fully activated. This results in more than 150 people in the EOC and creates very crowded conditions which limits the operational capacity of the COE (see Figure 27 and Figure 28). According to interviews, the overcrowding causes the EOC staff to restrict the number of people allowed into the facility, diminishing operational capacity, increasing coordination issues between partners, and resulting in less efficient response operations.

Figure 27. Interior of the EOC showing approximately half of the space available

Figure 28. Interior of the EOC showing approximately half of the space available

Stakeholder interviews indicate that some ministries have their own *salas*, while others do not. Fifty-nine percent (59%) of survey respondents' organizations maintain an Emergency Operations Center, indicating a high degree of commitment to coordinating disaster response operations. However, only 34% of these respondents stated that their EOCs have adequate resources to perform effectively, highlighting the need for increased resourcing.

Each regional, provincial, and municipal PMR Committee maintains a *sala* in their respective administrative building. S*alas* are dual purpose spaces designated for use during emergencies. *Salas* have very limited supplies (e.g. maps, phones, radios,

copy machines) and disaster management staff do not maintain lists of the equipment and supplies needed to perform operations. PMR committee members must bring all needed supplies and equipment, including computers and phones, when called to the *sala* during a disaster event, resulting in coordination challenges during the initial stages of a disaster.

Successes

Government resources

All government resources are available during a disaster.

Emergency shelter system

The emergency shelter system is well resourced and responsive.

EOC

The national EOC is a 24/7 facility with equipment and backup power, food and water, and an emergency communications system.

Challenges Identified

Lack of resource lists

Resource lists are not maintained or updated as required under the *Actualización del Plan Nacional de Emergencias*, which could potentially result in critical resource shortfalls during disaster response operations.

COE size

The COE is not of adequate size to accommodate the operational needs of all staff during a major disaster event, which results in inefficient staff coordination.

Salas have limited resources

Regional and provincial PMR Committee *salas* have limited resources, thereby impeding response time during the initial stages of a disaster.

Recommendations

01

Resource lists

Require ministries to develop and update lists of resources available for emergency operations and develop a central repository for the list at the COE (Impact: Minor).

Methodology / Resources. Review resource list submissions for all ministries and determine those that have not provided information or have provided inadequate information. Train ministry personnel on resource list requirements. Provide a list of ministries that have not provided resource lists to the President of CNE.

Effort:

Complexity: Simple

Cost: $

02

Purpose-built COE

Plan, construct and provide the necessary equipment for a stand-alone, purpose-built Emergency Operations Center (EOC) that can house all functions needed to respond to a large-scale national disaster (Impact: Significant).

Methodology / Resources. Review operational requirements and design, build and furnish a purpose-built national EOC.

Effort:

Complexity: Complex

Cost: $$$

03

Prioritize *salas* based on MHE and provide facilities

Prioritize regional and provincial *salas* based on overall multi-hazard exposure from the RVA and work with international partners to provide stand-alone facilities, equipment, and supplies to the top three at-risk provinces (Impact: Significant).

Methodology / Resources. Provide logistical and administrative areas (including an EOC) to the provinces that are most at-risk according to the findings of the RVA.

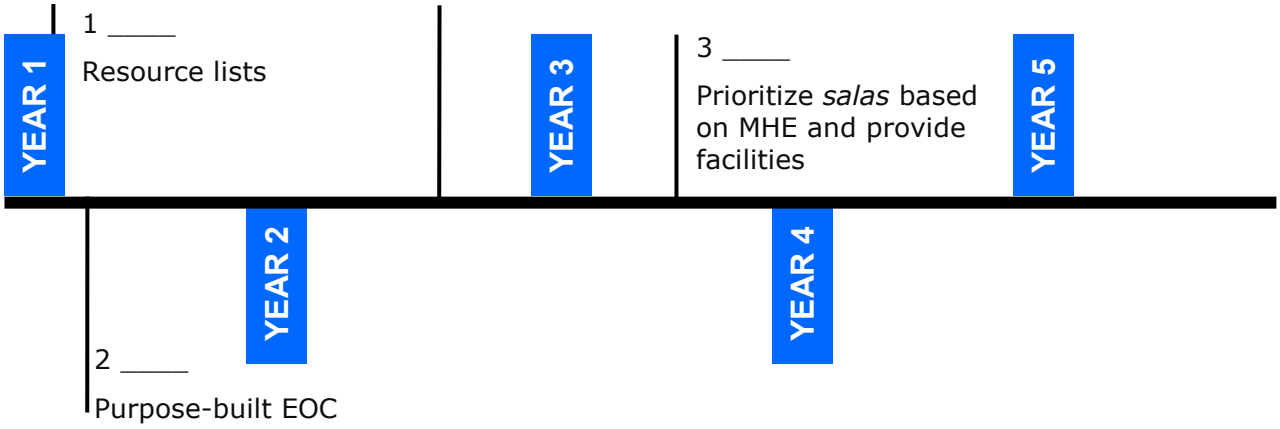
Effort:

Complexity: Medium

Cost: **$$$**

Five-Year Plan

Based on a review of the recommendations against four criteria (level of effort, difficulty, cost, and impact, a suggested timeline for the implementation of recommendations is provided below with the understanding that country stakeholders will further prioritize based on these, and other criteria.



CDM Five-Year Implementation Plan

Recommendations were prioritized for implementation over a five-year period based on feedback received from stakeholders at the Final Workshop and Knowledge Exchange (see

Figure 29).

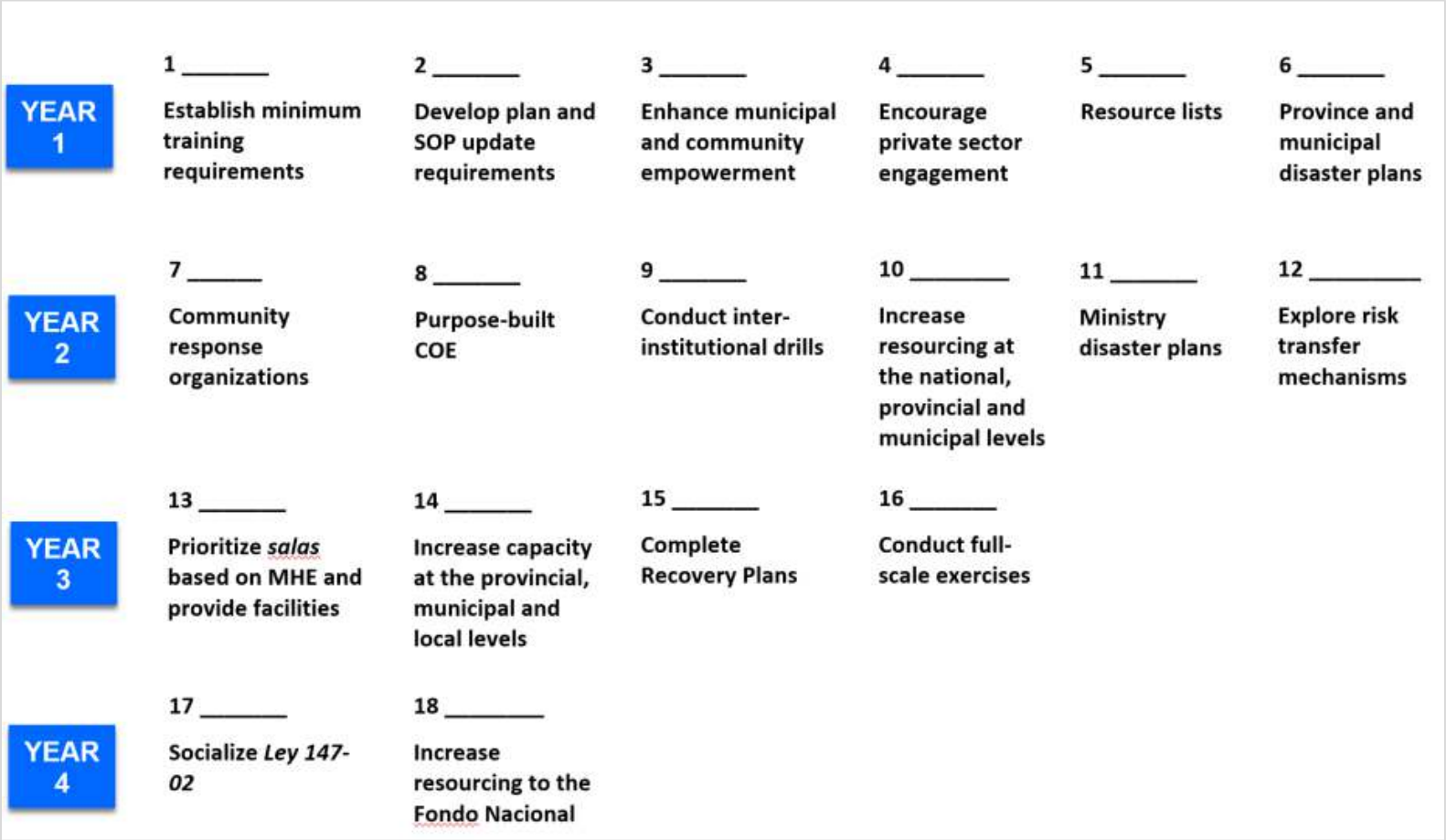


Figure 29. Five-year Implementation Plan for CDM Recommendations

Conclusion

The goal of the Dominican Republic NDPBA was to develop and conduct a baseline assessment focused on risk and vulnerability identification, and evaluation of existing disaster management capacities, leading to enhanced resilience to future hazards. Using two concurrent, stakeholder-driven analyses: Risk and Vulnerability Assessment (RVA) and Comprehensive Disaster Management (CDM), the Dominican Republic NDPBA results provide a comprehensive understanding of the strengths and challenges for managing and reducing disaster risk in Dominican Republic. Emerging from these results, are actionable recommendations to increase disaster management capabilities and guide investments with an aim to strengthen overall resilience.

The goal of the RVA was to characterize the elements of multi-hazard risk, and estimate the likelihood of a negative occurrence given exposure to natural hazards. RVA results describe the collective characteristics of each province that predispose it to detrimental hazard impacts, including an examination of Multi-Hazard Exposure, Vulnerability, and Coping Capacity.

The results of the RVA highlighted areas of the country that may require support in preparing for, responding to, and recovering from disasters. By identifying specific factors that influence risk in each province, the RVA supports evidence-based decision making through focused interventions that increase coping capacity, reduce vulnerability, and acknowledge hazard exposure at the subnational level. In summarizing the results of the RVA across Dominican Republic, prevalent drivers of risk included hazard exposure, economic constraints and access to information.

The goal of disaster management is to create safer communities and implement programs that protect human life, reduce losses and promote rapid recovery. Disaster management activities are most effective when informed by risk and vulnerability information such as what hazards are most likely to occur and where, and who and what may be in harm’s way. Characteristics of the population and the built environment play a key role in determining vulnerability to hazard impacts and potential losses. Investing in projects and programs that aim to reduce risk and vulnerability and boost disaster management capacities and capabilities will promote resilience and support sustainable long-term growth and development.

Using a mixed methods approach, the CDM assessment examined preparedness and response capacities and capabilities in the Dominican Republic. Assessment results provide actionable recommendations that draw on existing strengths and address possible gaps that affect the delivery of effective disaster management.

The Dominican Republic has a strong national disaster management system. The country’s legal framework, highly integrated disaster planning and support for training programs have established a firm foundation for steady advancement of

CDM principles. The greatest strength of the Dominican Republic is the spirit of volunteerism, which has enabled the disaster management system to flourish with a minimum of state-provided resources. Additionally, CNE has recognized gaps in training capacity and is revamping the curriculum of the National Risk Management School to fill those gaps.

The Dominican Republic is on the path of implementing its vision of comprehensive disaster management. Overcoming challenges related to budget constraints (including the lack of adequate facilities), lack of capacity and resources, and the lack of engagement with the private sector will positively influence CDM growth for the country.

The RVA and CDM elements of the NDPBA are complementary, providing valuable context for increasing resilience in Dominican Republic. The RVA helps disaster managers decide where and how to focus limited resources, and enables them to anticipate the severity of impacts and the need for response activities such as evacuation and sheltering. The CDM assessment characterizes the structure and capacity of the country's disaster management system, through which DRR activities will take place.

The recommendations provided in this assessment are designed to be implemented over the next five years, after which time a follow-up assessment can be used to evaluate program effectiveness and progress from the baseline provided by the NDPBA. As a measurable and repeatable approach, the NDPBA provides a methodology to support national and regional efforts to save lives and protect property by continuing to build a more disaster-resilient nation.

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Province Profiles

National Disaster Preparedness Baseline Assessment
Final Report

Better solutions.
Fewer disasters.
Safer world.

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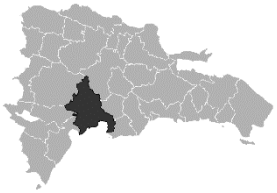
Azua

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Azua

Province Capital: Azua



Area: 3,001 km^2

Azua's economy is based on coffee, sugar and tobacco plantations. It is also supported by cereal, rice, vegetables, and corn crops. The city of Azua is rich in monuments and buildings with historical, social or religious value.

Municipality	Population
Azua	93,969
Estebanía	5,804
Guayabal	5,415
Las Charcas	11,566
Las Yayas de Viajama	18,126
Padre las Casas	20,615
Peralta	15,695
Pueblo Viejo	11,559
Sabana Yegua	19,567
Tábara Arriba	18,154

Multi-Hazard Risk Rank: Low (25 of 32)

Lack of Resilience Rank: High (9 of 32)

RVA Component Scores

Table 12. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		High		Low		Very High		Very High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.473	25	0.525	9	0.370	26	0.585	6	0.536	7

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[3] Rank: 26 of 32 Provinces (Score: 0.370)

Table 13. Estimated ambient population[4] exposed to each hazard

Cyclone

100%

253,656 People

Earthquake

1%

2,522 People

Landslide

69%

175,417 People

Flood

49%

123,640 People

Tsunami

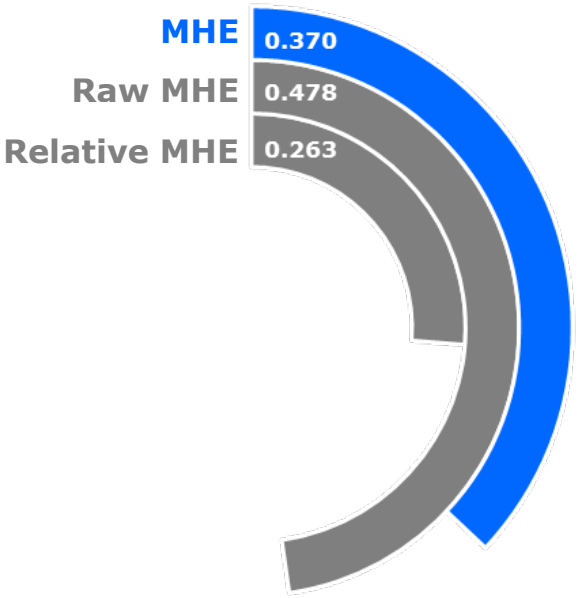
2%

4,971 People

Case Study: Disaster Risk Reduction in Las Terreras, Azua

After Hurricane Sandy decimated a significant portion of the Dominican Republic in 2012, including coastal communities in Azua, NGOs and the European Commission's Humanitarian Aid and Civil Protection Department (ECHO) partnered to implement disaster risk reduction programs in impacted areas. With the aim of building resilience in communities affected by major weather events on a routine basis, ECHO and NGOs supported the construction of livestock shelters for the protection of farmers' livelihoods. Communities were also educated in the country's alert levels and how to ensure their safety at each level of alert.

"The Dominican Republic Prepares for Future Hurricanes and Floods" – European Commission, 14 October 2015



[3] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[4] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[5] Rank: 6 of 32 Provinces (Score: 0.585) Vulnerability in Azua is primarily influenced by **Gender Inequality, Environmental Stress** and **Information Access Vulnerability.** The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

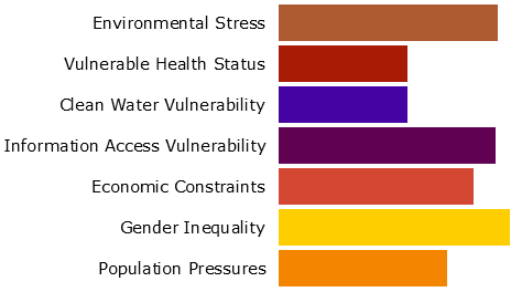


Table 14. Component Scores for each Vulnerability Sub-component

Environmental Stress	**90%** Province Susceptible to Drought	**-1.4%** Average Annual Forest Change					
Vulnerable Health Status	**14.8** Infant Mortality Rate	**102.7** Maternal Mortality Rate	**13.5** Chronic Malnutrition	**7.1%** Population Disabled			
Clean Water Vulnerability	**11.3%** Households without Access to Improved Water	**15.9%** Households without Access to Flush Toilets					
Information Access Vulnerability	**24.3%** Illiteracy	**85.3%** Primary School Enrollment	**95.9%** Households without Internet	**37.3%** Households without TV	**63.7%** Households without Radio	**5.4** Average years of Schooling	
Economic Constraints	**62.4** Economic Dependency Ratio	**65.1%** Population in Poverty	**47.0%** CEP Beneficiaries				
Gender Inequality	**34.1%** Female Seats in Government	**1.2** Female to Male Years of Schooling	**0.54** Female to Male Labor Ratio				

[5] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Population Pressures	**0.37%** Average Annual Population Change	**5.6%** Average Annual Urban Population Change	

Coping Capacity (CC)

Coping Capacity[6] Rank: 7 of 32 Provinces (Score: 0.536) The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure (Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

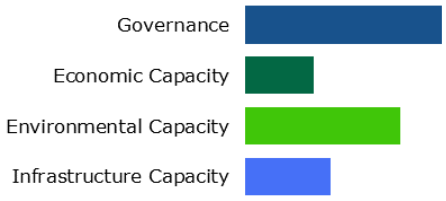


Table 15. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.98** Debt to Service Ratio	**91.7%** Employment Rate (Male)	**RD$ 15,330** Average Annual Income per Capita			
Governance	**82.1%** Registered Voter Participation (2016 Election)	**11.4** Homicide Rate per 100k persons	**80.5%** Households with Garbage Collection			
Environmental Capacity	**47.2%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**14.1** Hospital Beds per 10,000 Persons	**15.2** Nurses per 10,000 Persons	**14.4** Physicians per 10,000 Persons	**4.5 km** Average Distance to Nearest Hospital	**0.78** Vaccination Index[7]	

[6] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[7] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

	**Communications Capacity**	**9.7%** Households with Access to Fixed Phone Line	**62.1%** Households with Access to Mobile Phone
	**Transportation Capacity**	**21.9 km** Average Distance to Nearest Port or Airport	**0.35 km** Total Length of Road per km^2 (area)

Lack of Resilience (LR)

Lack of Resilience[8] Rank: 9 of 32 Provinces (Score: 0.525)

Azua's score and ranking are due to very high Vulnerability combined with high Coping Capacity scores. Azua has the 6th highest Vulnerability and the 7th highest Coping Capacity.

Table 16. The 3 Thematic areas with the Weakest Relative Scores

Gender Inequality

Environmental Stress

Communications Infrastructure Capacity

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[9] Rank: 25 of 32 Provinces (Score: 0.473)

Azua's score and ranking are due to very low Multi-Hazard Exposure combined with very high Vulnerability scores and high Coping Capacity.

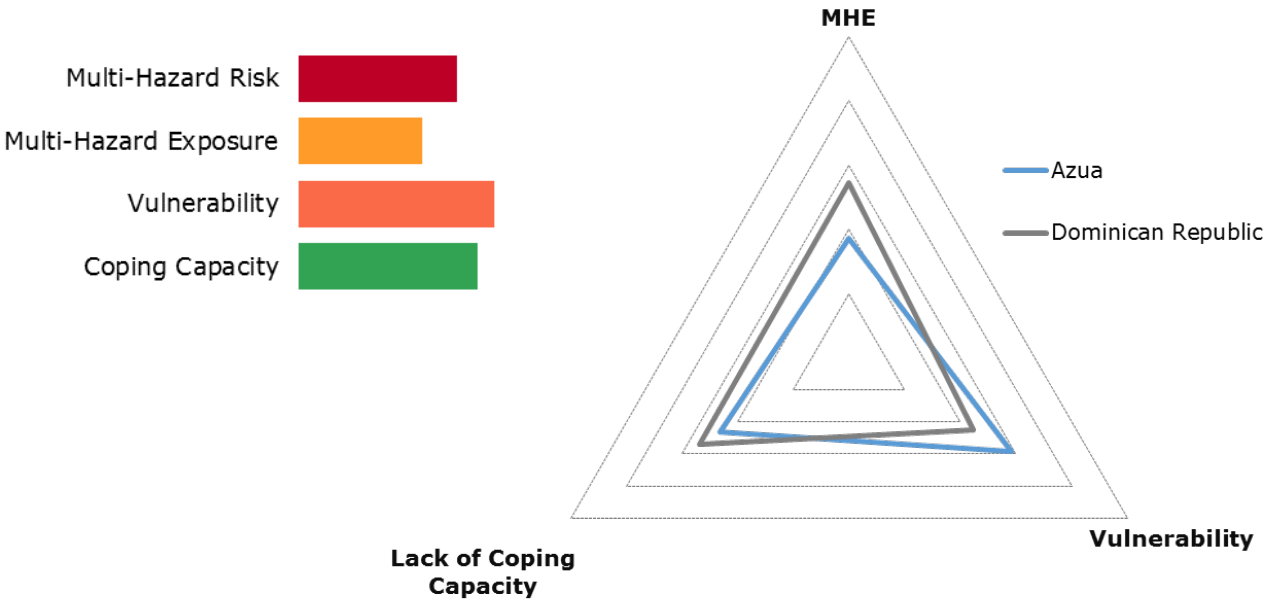


Figure 30. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[8] **Lack of Resilience**: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[9] **Multi-Hazard Risk**: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High coping capacity

Ranked 7 of 32 provinces, high coping capacity indicates the province's ability, using existing skills and resources, to face and manage adverse conditions, emergencies, or disasters.

Highest overall governance

Ranked 1 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Recommendations

01

Promote gender equality

Support equal-educational enrollment at all levels; access to the labor market, wages, and credit; and political representation to reduce vulnerability.

02

Reduce environmental stress

Invest in drought- and erosion-mitigation and reforestation projects to reduce environmental stress and degradation.

03

Increase information access

Invest in educational programs, including non-traditional, community-based approaches to increase educational attainment and adult literacy. Support comprehensive efforts to increase access to information mediums (phone, internet, TV, radio) and distribute disaster-preparedness and hazard-warning information in multiple formats and across multiple platforms, ensuring that vulnerable communities receive easily understandable and actionable disaster-related information.

Better solutions.
Fewer disasters.
Safer world.

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Baoruco

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Baoruco

Province Capital: Neiba

Area: 1,435 km^2

Baoruco province is located in the *Hoya de Enriquillo* valley, a dry valley with some parts below sea level. Baoruco is an important area for the extraction and commercialization of the larimar gemstone.

99,964
Population
(2017)

74.5%
Population in Poverty

24.9%
Illiterate Population

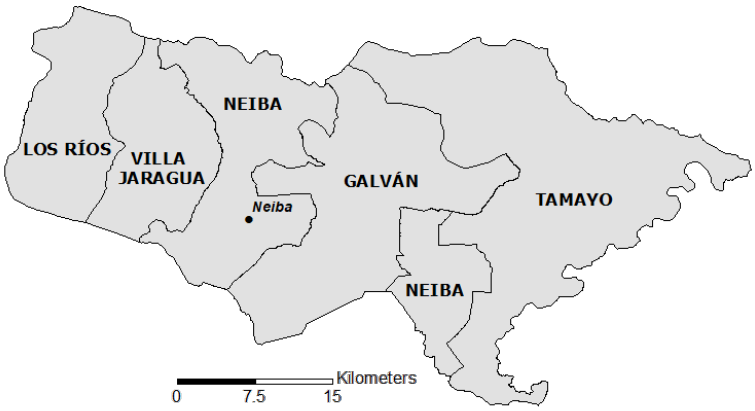
15.6
Infant Mortality Rate

86.0%
Access to Improved Water

Municipality	Population
Neiba	37,508
Galván	16,129
Tamayo	27,501
Villa Jaragua	10,907
Los Ríos	7,919

Multi-Hazard Risk Rank: Very High (4 of 32)

Lack of Resilience Rank: Very High (2 of 32)



RVA Component Scores

Table 17. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		**Very High**		**Low**		**Very High**		**Very Low**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.563	4	0.653	2	0.382	24	0.655	1	0.349	30

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[10] Rank: 24 of 32 Provinces (Score: 0.382)

Table 18. Estimated ambient population[11] exposed to each hazard

Cyclone

100%

111,075 People

Earthquake

52%

57,701 People

Landslide

66%

73,421 People

Flood

33%

37,039 People

Tsunami

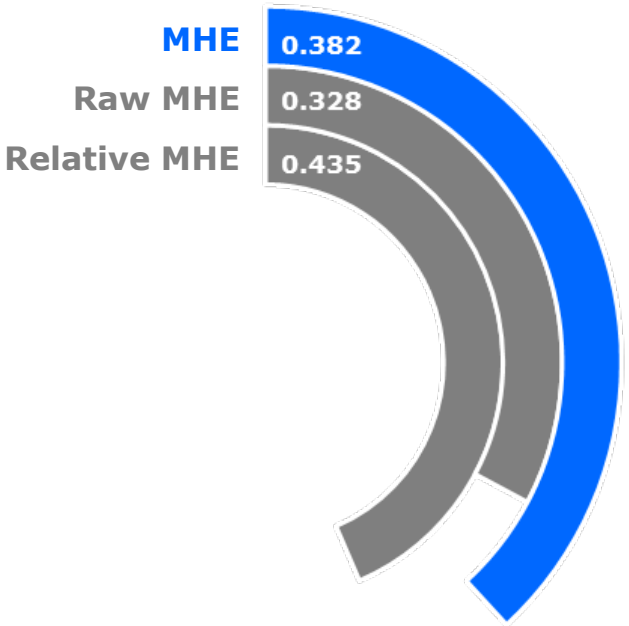
0%

0 People

Case Study: Disaster Impacts and Vulnerable Populations

After the passage of Tropical Storm Noel in October 2007, UNFPA and UN-INSTRAW partnered to conduct an evaluation on the impacts of disasters on vulnerable persons in the Dominican Republic. The province of Baoruco was included in the evaluation, as it was one of the regions most affected by the storm in terms of affected homes and number of displaced persons. Baoruco's high rate of extreme poverty significantly impacted its capacity to prepare for and respond to Tropical Storm Noel, exposing its vulnerable persons to increased instances of violence and traumatic stress. The UN agencies proposed a series of recommendations to improve security and enhance the safety of vulnerable persons in the province.

"*UN study: Vulnerable populations and natural disasters" – UN International Research and Training Institute for the Advancement of Women (ReliefWeb), 09 October 2008*



[10] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[11] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[12] Rank: 1 of 32 Provinces (Score: 0.655) Vulnerability in Baoruco is primarily influenced by **Vulnerable Health Status, Economic Constraints,** and **Information Access Vulnerability.** The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

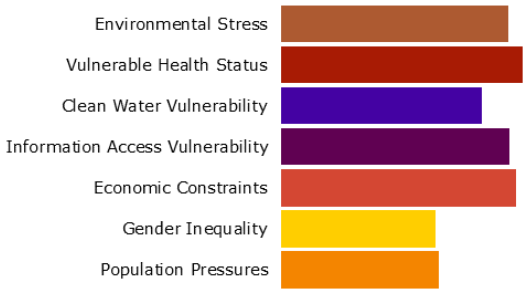


Table 19. Component Scores for each Vulnerability Sub-component

Environmental Stress	**100%** Province Susceptible to Drought	**-0.6%** Average Annual Forest Change					
Vulnerable Health Status	**15.6** Infant Mortality Rate	**294.7** Maternal Mortality Rate	**18.3** Chronic Malnutrition	**8.4%** Population Disabled			
Clean Water Vulnerability	**14.0%** Households without Access to Improved Water	**25.3%** Households without Access to Flush Toilets					
Information Access Vulnerability	**24.9%** Illiteracy	**86.5%** Primary School Enrollment	**97.1%** Households without Internet	**38.5%** Households without TV	**66.1%** Households without Radio	**5.0** Average years of Schooling	
Economic Constraints	**72.6** Economic Dependency Ratio	**74.5%** Population in Poverty	**40.5%** CEP Beneficiaries				
Gender Inequality	**41.4%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.52** Female to Male Labor Ratio				
Population Pressures	**0.33%** Average Annual Population Change	**5.0%** Average Annual Urban Population Change					

[12] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[13] Rank: 30 of 32 Provinces (Score: 0.349) The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure (Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

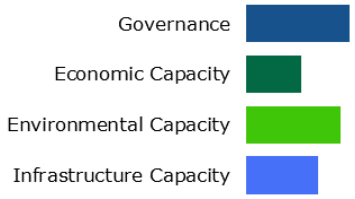


Table 20. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.88** Debt to Service Ratio	**89.6%** Employment Rate (Male)	**RD$ 15,762** Average Annual Income per Capita			
Governance	**79.6%** Registered Voter Participation (2016 Election)	**23.2** Homicide Rate per 100k persons	**59.7%** Households with Garbage Collection			
Environmental Capacity	**28.9%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**12.9** Hospital Beds per 10,000 Persons	**25.3** Nurses per 10,000 Persons	**10.8** Physicians per 10,000 Persons	**4.4 km** Average Distance to Nearest Hospital	**0.95** Vaccination Index[14]
Communications Capacity	**6.8%** Households with Access to Fixed Phone Line	**56.4%** Households with Access to Mobile Phone			
Transportation Capacity	**36.6 km** Average Distance to Nearest Port or Airport	**0.39 km** Total Length of Road per km^2 (area)			

[13] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[14] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[15] Rank: 2 of 32 Provinces (Score: 0.653)

Baoruco's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. Baoruco ranks 1st in Vulnerability and 30th in Coping Capacity.

Table 21. The 3 Thematic areas with the Weakest Relative Scores

Vulnerable Health Status	**Economic Constraints**	**Economic Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[16] Rank: 4 of 32 Provinces (Score: 0.563)

Baoruco's score and ranking are driven primarily by very high Vulnerability and very low Coping Capacity scores.

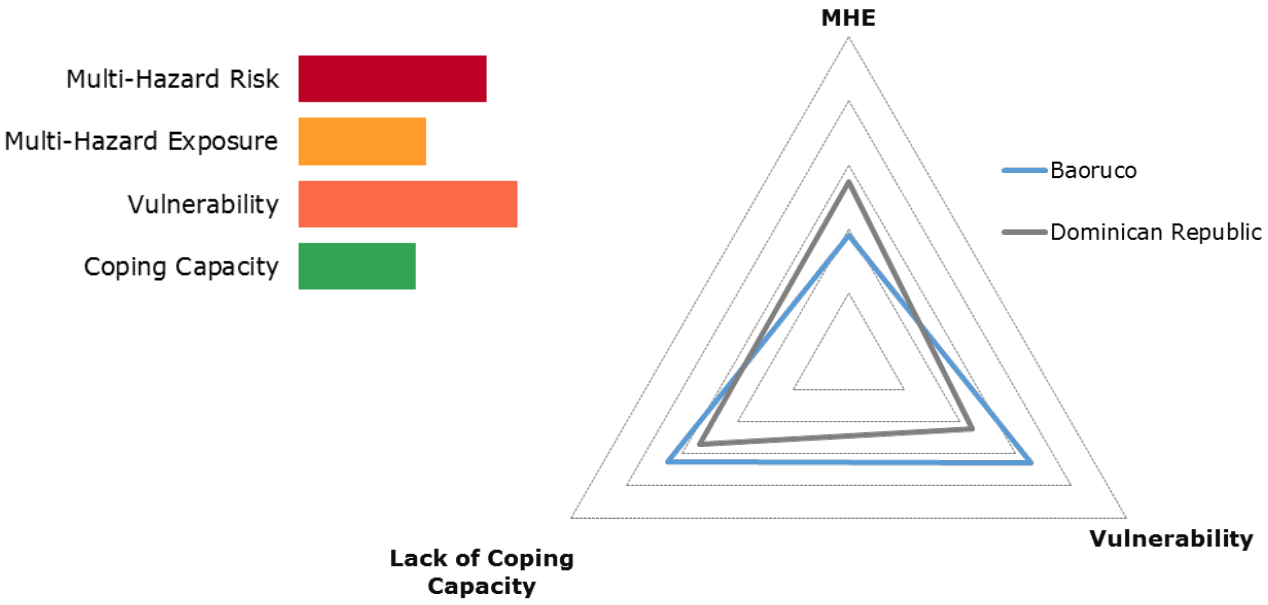


Figure 31. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[15] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[16] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Relatively low gender inequality

Driven by relative gender parity in government representation, education and in the workforce. Low gender inequality indicates that vulnerable populations are more likely to have their needs met under 'normal' conditions and may be less susceptible during times of disaster.

Recommendations

01

Reduce vulnerable health status

Invest in public welfare services to decrease malnutrition, support the disabled population, and decrease infant and maternal mortality.

02

Increase economic capacity

Foster small-business development and invest in business education and human capital to raise economic stability and increase employment.

03

Alleviate economic constraints

Focus investments to reduce poverty and encourage business development and education programs to increase stable and viable economic opportunities in the region.

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Fewer disasters.
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Barahona

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Barahona

Province Capital: Barahona

Area: 1,847 km^2

Barahona, located in the southwest of the country, is known for its beaches and turquoise waters. The main economic activity of the province is agriculture, producing coffee in the mountains and plantain and sugar cane in the valley of the river.

188,929
Population
(2017)

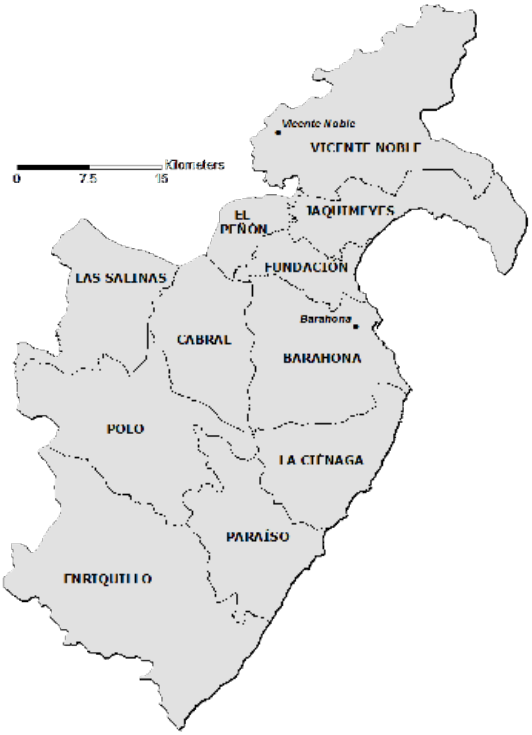
65.1%
Population in Poverty

18.7%
Illiterate Population

18.3
Infant Mortality Rate

87.3%
Access to Improved Water

Municipality	Population
Barahona	84,442
Cabral	14,967
Enriquillo	13,290
Paraíso	15,538
Vicente Noble	21,815
El Peñón	4,008
La Cienega	9,199
Fundación	8,122
Las Salinas	4,748
Polo	8,269
Jaquimeyes	4,531



Multi-Hazard Risk Rank: Low (26 of 32)

Lack of Resilience Rank: High (12 of 32)

RVA Component Scores

Table 22. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		High		Low		Medium		Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.472	26	0.511	12	0.393	23	0.458	15	0.435	21

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[17] Rank: 23 of 32 Provinces (Score: 0.393)

Table 23. Estimated ambient population[18] exposed to each hazard

Cyclone

100%

215,159 People

Earthquake

0%

0 People

Landslide

72%

155,643 People

Flood

51%

109,409 People

Tsunami

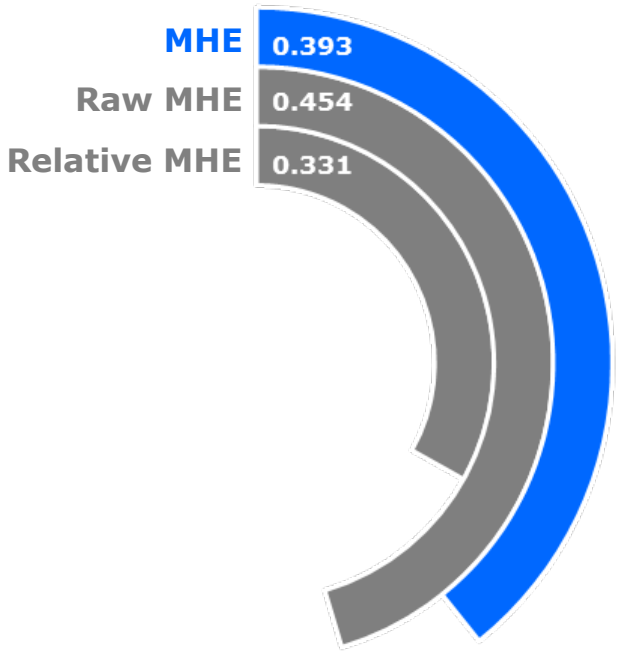
10%

21,028 People

Case Study: Building Resilience in Santa Cruz de Barahona

In July 2012, Santa Cruz de Barahona signed up for UNISDR's "Making Cities Resilient" Campaign. Concern regarding earthquakes and tsunamis prompted the city's support of the Campaign which aims "to reduce the loss of life due to disasters caused by natural hazards and to build the resilience of cities so that they can be better prepared and can better cope with the potential problems caused by disasters." Santa Cruz de Barahona further committed to the development of a Municipal Risk Management Unit with support from external partners, as well as training first responders in post-earthquake search and rescue, in order to "position itself internationally as a safe and resilient city."

"Cities Campaign Expands in Dominican Republic" – UNISDR, 23 July 2012



[17] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[18] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[19] Rank: 15 of 32 Provinces (Score: 0.458) Vulnerability in Barahona is influenced by **Economic Constraints,** and **Information Access Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

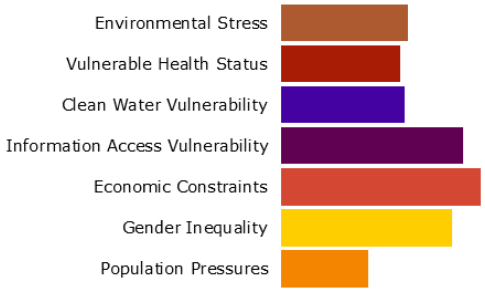


Table 24. Component Scores for each Vulnerability Sub-component

Environmental Stress	**41%** Province Susceptible to Drought	**-0.0%** Average Annual Forest Change					
Vulnerable Health Status	**18.3** Infant Mortality Rate	**45.3** Maternal Mortality Rate	**13.6** Chronic Malnutrition	**6.3%** Population Disabled			
Clean Water Vulnerability	**12.7%** Households without Access to Improved Water	**14.3%** Households without Access to Flush Toilets					
Information Access Vulnerability	**18.7%** Illiteracy	**88.8%** Primary School Enrollment	**94.4%** Households without Internet	**34.4%** Households without TV	**62.0%** Households without Radio	**5.9** Average years of Schooling	
Economic Constraints	**66.5** Economic Dependency Ratio	**65.1%** Population in Poverty	**42.8%** CEP Beneficiaries				
Gender Inequality	**37.9%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.50** Female to Male Labor Ratio				
Population Pressures	**0.09%** Average Annual Population Change	**2.0%** Average Annual Urban Population Change					

[19] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[20] Rank: 21 of 32 Provinces (Score: 0.435) The thematic areas with the weakest relative scores are **Infrastructure (Communications and Transportation),** and **Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

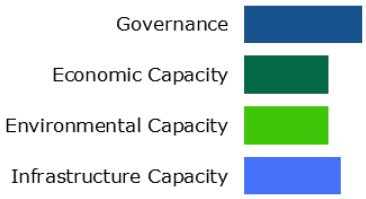


Table 25. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.89** Debt to Service Ratio	**91.5%** Employment Rate (Male)	**RD$ 16,867** Average Annual Income per Capita			
Governance	**78.2%** Registered Voter Participation (2016 Election)	**22.3** Homicide Rate per 100k persons	**70.5%** Households with Garbage Collection			
Environmental Capacity	**25.7%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**16.4** Hospital Beds per 10,000 Persons	**32.7** Nurses per 10,000 Persons	**15.1** Physicians per 10,000 Persons	**5.0 km** Average Distance to Nearest Hospital	**0.71** Vaccination Index[21]	
Communications Capacity	**11.9%** Households with Access to Fixed Phone Line	**63.0%** Households with Access to Mobile Phone				
Transportation Capacity	**20.0 km** Average Distance to Nearest Port or Airport	**0.34 km** Total Length of Road per km^2 (area)				

[20] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[21] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[22] Rank: 12 of 32 Provinces (Score: 0.511)

Barahona's score and ranking are due to moderate Vulnerability combined with low Coping Capacity scores. Barahona ranks 15th in Vulnerability and 21st in Coping Capacity.

Table 26. The 3 Thematic areas with the Weakest Relative Scores

Communications Capacity

Economic Constraints

Economic Capacity

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[23] Rank: 26 of 32 Provinces (Score: 0.472)

Barahona's score and ranking are due to low Multi-Hazard Exposure combined with moderate Vulnerability and low Coping Capacity scores.

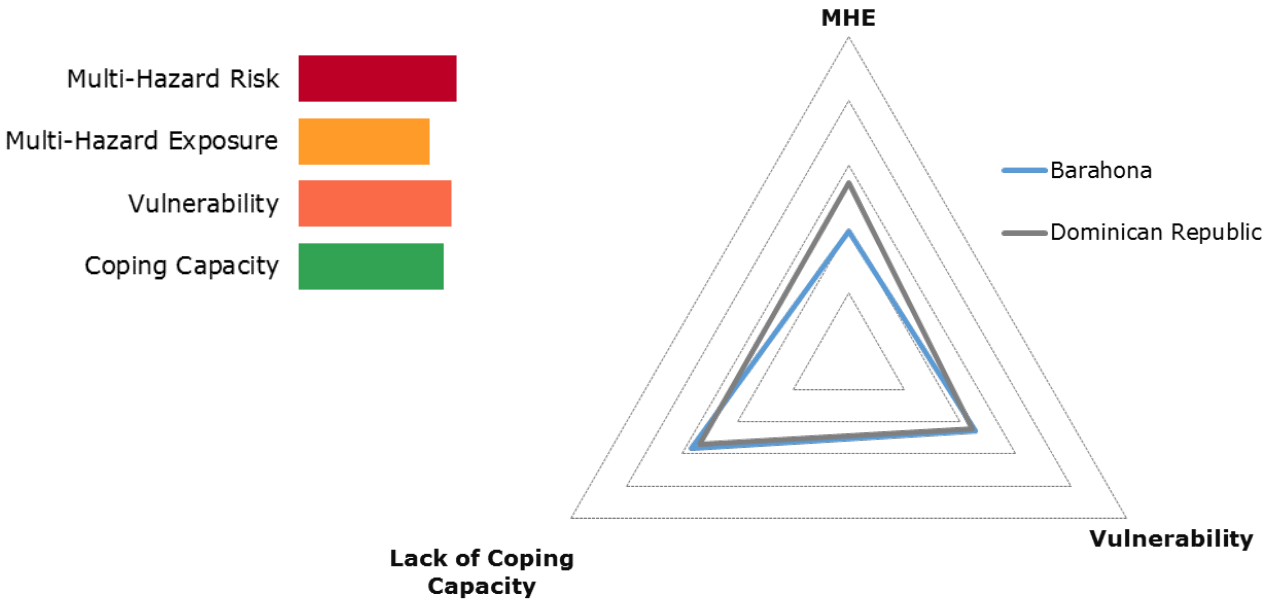


Figure 32. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[22] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[23] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High health care capacity

Ranked 9 of 32 provinces, high health care capacity indicates that the population will have access to healthcare services before, during, and after a disaster.

High environmental capacity

Ranked 10 of 32 provinces, high environmental capacity indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Recommendations

01

Alleviate economic constraints

Focus investments to reduce poverty and encourage business development and education programs to increase stable and viable economic opportunities in the region.

02

Increase information access and communications capacity

Invest in educational programs, including non-traditional, community-based approaches to increase educational attainment and adult literacy. Support comprehensive efforts to increase access to information mediums (phone, internet, TV, radio) and distribute disaster-preparedness and hazard-warning information in multiple formats and across multiple platforms, ensuring that vulnerable communities receive easily understandable and actionable disaster-related information.

03

Increase economic capacity

Foster small-business development and invest in business education and human capital to raise economic stability and increase employment.

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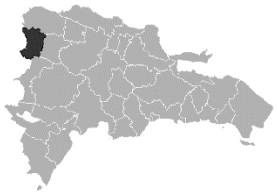
Dajabón

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Dajabón

Province Capital: Dajabón



Area: 1,153 km^2

Dajabón is located in the northwest of the country and serves as a trade center for the hides, timber, bananas, coffee and honey produced in the region.

65,760
Population
(2017)

53.7%
Population in Poverty

16.8%
Illiterate Population

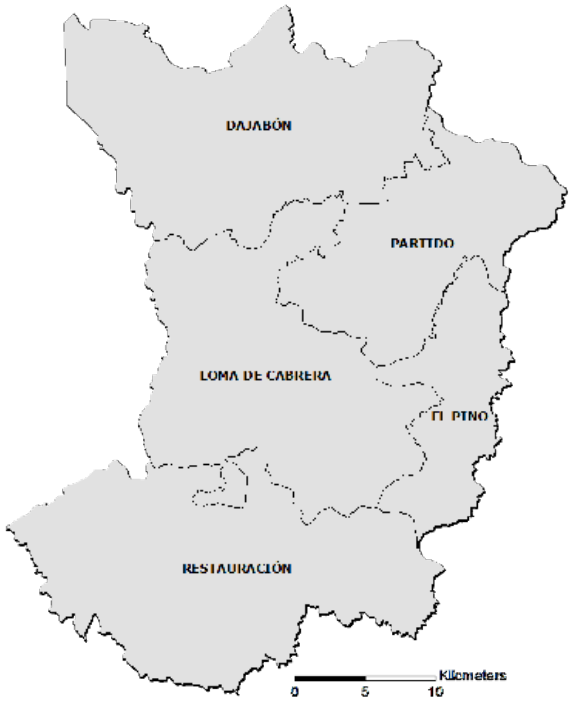
20.6
Infant Mortality Rate

93.6%
Access to Improved Water

Municipality	Population
Dajabón	28,865
Loma De Cabrera	16,067
Partido	7,146
Restauración	7,478
El Pino	6,204

Multi-Hazard Risk Rank: Very Low (27 of 32)

Lack of Resilience Rank: High (13 of 32)



RVA Component Scores

Table 27. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very Low		**High**		**Very Low**		**Medium**		**Low**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.457	27	0.508	13	0.355	29	0.44	17	0.424	22

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[24] Rank: 29 of 32 Provinces (Score: 0.355)

Table 28. Estimated ambient population[25] exposed to each hazard

Cyclone

100%

101,793 People

Earthquake

100%

101,793 People

Landslide

46%

46,796 People

Flood

0%

46 People

Tsunami

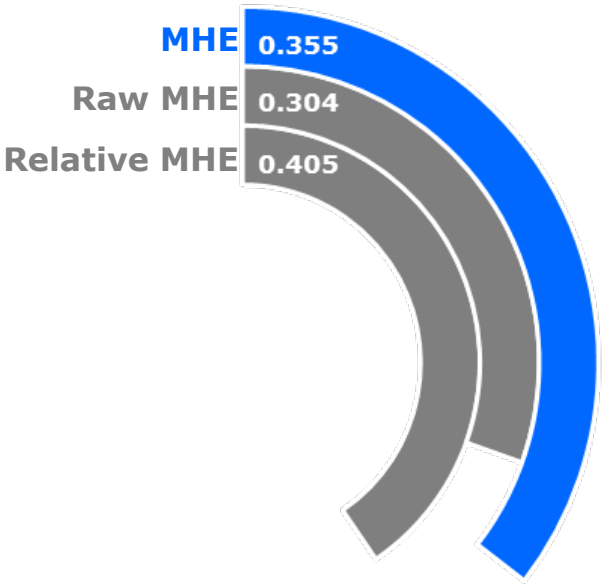
0%

0 People

Case Study: Early Warning Systems in Dajabón

During the 2017 hurricane season, the Dominican Republic was impacted by Hurricanes Irma and Maria in rapid succession. The country's Provincial and Municipal *Prevention, Mitigation and Response Committees (CPMRs)* were required to activate their Early Warning Systems and emergency plans in order to prevent loss of life among the population. Dajabón's Provincial Committee exhibited exemplary planning and coordination, with its CPMR performing "efficiently and effectively" in the activation of its emergency plans and Early Warning Systems.

"Effectiveness of Disaster Risk Reduction (DRR) Programs Funded by ECHO in the Caribbean - Evidence Collected After Hurricanes Irma and Maria" - DIPECHO



[24] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[25] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[26] Rank: 17 of 32 Provinces (Score: 0.440) Vulnerability in Dajabón is influenced primarily by **Vulnerable Health Status, Economic Constraints,** and **Population Pressures**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

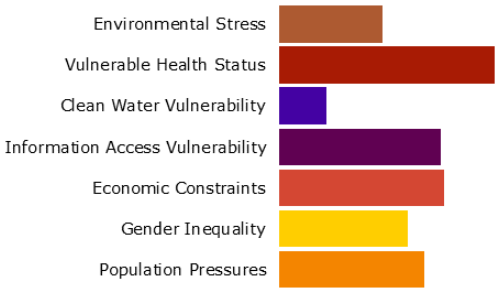


Table 29. Component Scores for each Vulnerability Sub-component

Environmental Stress	**24.7%** Province Susceptible to Drought	**-0.2%** Average Annual Forest Change					
Vulnerable Health Status	**20.6** Infant Mortality Rate	**258.0** Maternal Mortality Rate	**16.2** Chronic Malnutrition	**6.6%** Population Disabled			
Clean Water Vulnerability	**6.4%** Households without Access to Improved Water	**6.3%** Households without Access to Flush Toilets					
Information Access Vulnerability	**16.8%** Illiteracy	**88.6%** Primary School Enrollment	**94.7%** Households without Internet	**33.3%** Households without TV	**52.7%** Households without Radio	**5.9** Average years of Schooling	
Economic Constraints	**63.7** Economic Dependency Ratio	**53.7%** Population in Poverty	**41.9%** CEP Beneficiaries				
Gender Inequality	**46.0%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.50** Female to Male Labor Ratio				
Population Pressures	**0.35%** Average Annual Population Change	**3.9%** Average Annual Urban Population Change					

[26] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[27] Rank: 22 of 32 Provinces (Score: 0.424) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

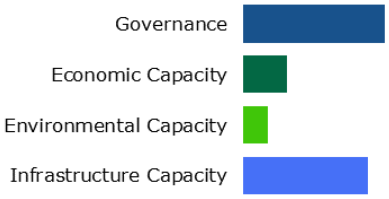


Table 30. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.1** Debt to Service Ratio	**90.9%** Employment Rate (Male)	**RD$ 18,753** Average Annual Income per Capita			
Governance	**81.4%** Registered Voter Participation (2016 Election)	**16.9** Homicide Rate per 100k persons	**61.5%** Households with Garbage Collection			
Environmental Capacity	**7.7%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**21.7** Hospital Beds per 10,000 Persons	**31.8** Nurses per 10,000 Persons	**20.6** Physicians per 10,000 Persons	**3.1 km** Average Distance to Nearest Hospital	**0.86** Vaccination Index[28]
Communications Capacity	**10.7%** Households with Access to Fixed Phone Line	**76.4%** Households with Access to Mobile Phone			
Transportation Capacity	**32.9 km** Average Distance to Nearest Port or Airport	**0.49 km** Total Length of Road per km^2 (area)			

[27] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[28] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[29] Rank: 13 of 32 Provinces (Score: 0.508)

Dajabón's score and ranking are due to moderate Vulnerability (17th) combined with low Coping Capacity (22nd) scores.

Table 31. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity	**Economic Capacity**	**Vulnerable Health Status**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[30] Rank: 27 of 32 Provinces (Score: 0.457)

Dajabón's score and ranking are due to very low Multi-Hazard Exposure combined with moderate Vulnerability and low Coping Capacity scores.

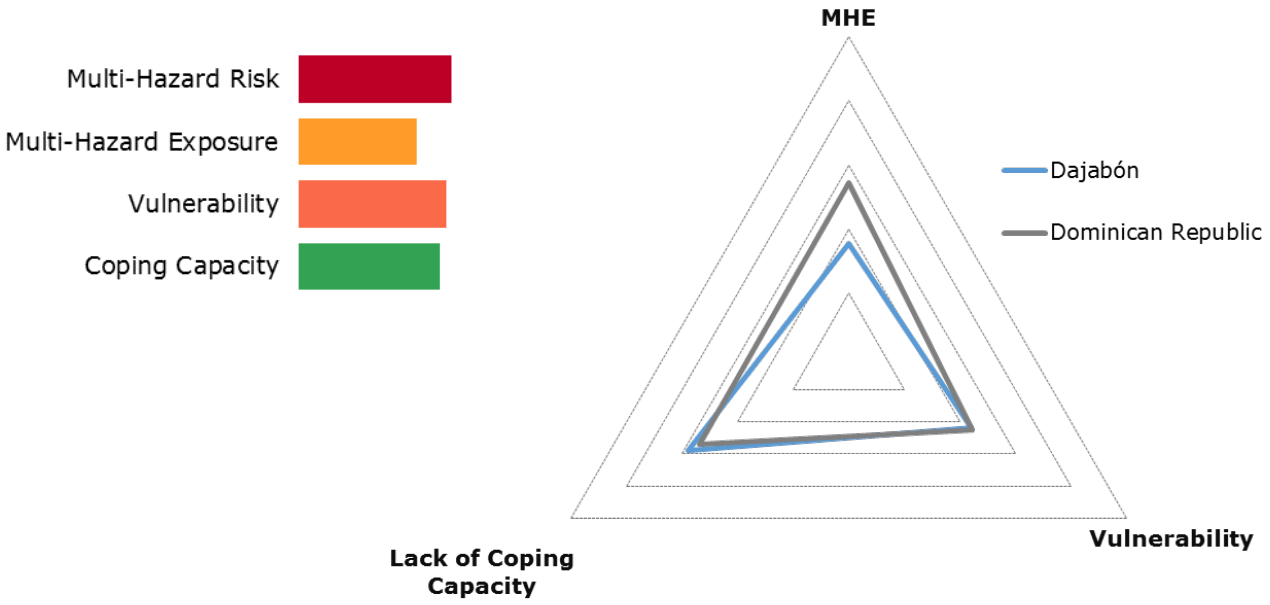


Figure 33. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[29] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[30] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low clean water vulnerability

Ranking 28 of 32 provinces, low clean water vulnerability indicates that a population has access to high water quality and good containment systems, reducing susceptibility to disaster.

Low gender inequality

Ranked 28 of 32 provinces, low gender inequality indicates that vulnerable populations are more likely to have their needs met under 'normal' conditions and may be less susceptible during times of disaster.

Recommendations

01

Reduce vulnerable health status

Invest in public welfare services to decrease malnutrition, support the disabled population, and decrease infant and maternal mortality.

02

Increase economic capacity

Foster small-business development and invest in business education and human capital to raise economic stability and increase employment.

03

Improve environmental capacity

Invest in protected areas to reduce environmental stress and degradation.

Better solutions.
Fewer disasters.
Safer world.

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Distrito Nacional

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Distrito Nacional

Area: 102 km^2
The Distrito Nacional is a subdivision of the Dominican Republic and includes the National capital city of Santo Domingo.

1,022,236 Population (2017)

28.3% Population in Poverty

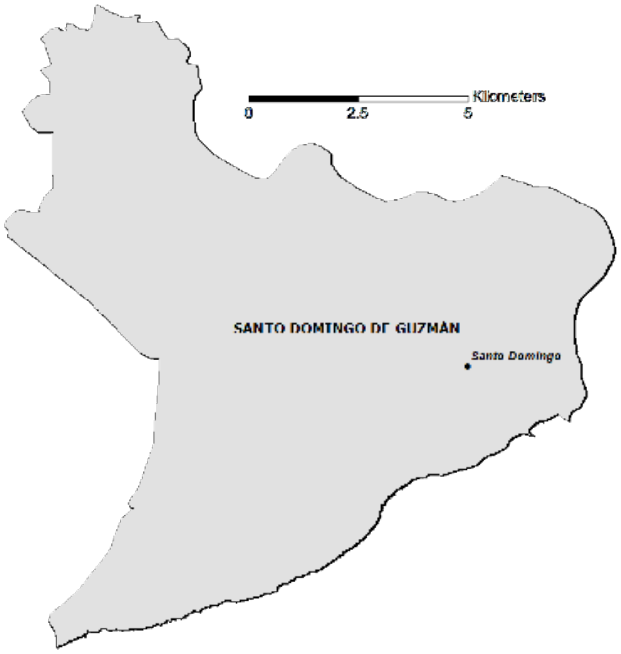
7.4% Illiterate Population

22.4 Infant Mortality Rate

97.7% Access to Improved Water

Multi-Hazard Risk Rank: Very Low (30 of 32)

Lack of Resilience Rank: Very Low (32 of 32)



RVA Component Scores

Table 32. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very Low		Very Low		Very High		Very Low		Very High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.426	30	0.257	32	0.764	6	0.153	32	0.639	1

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[31] Rank: 6 of 32 Provinces (Score: 0.764)

Table 33. Estimated ambient population[32] exposed to each hazard

Cyclone

100%

1,109,778 People

Earthquake

98%

1,088,411 People

Landslide

85%

942,975 People

Flood

1%

6,612 People

Tsunami

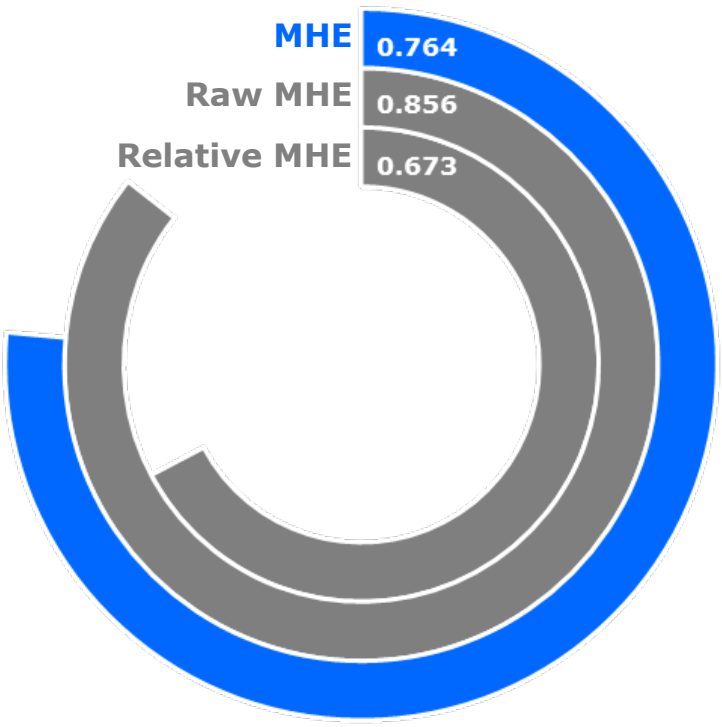
10%

109,062 People

Case Study: Reducing Childhood Vulnerability in Distrito Nacional

The Palmera Development Program operates within Distrito Nacional with the goal of improving the well-being of the area's most vulnerable children. With a long-term, holistic focus, the program "seeks to enable… families, local communities and partners to address the underlying causes of poverty." The program has conducted small business trainings, developed health committees, and has worked with local partners to continue to strengthen the development and growth of children in the area.

"Palmera Development Program" – NGO Aid Map



[31] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[32] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[33] Rank: 32 of 32 Provinces (Score: 0.153)
Distrito Nacional is influenced by moderate subcomponent scores in the thematic areas of **Vulnerable Health Status** and **Population Pressures**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

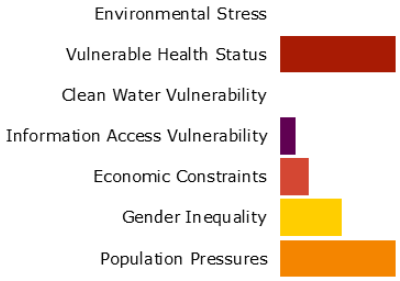


Table 34. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**5.9%** Average Annual Forest Change					
Vulnerable Health Status	**22.4** Infant Mortality Rate	**67.3** Maternal Mortality Rate	**7.1** Chronic Malnutrition	**7.8%** Population Disabled			
Clean Water Vulnerability	**2.3%** Households without Access to Improved Water	**1.2%** Households without Access to Flush Toilets					
Information Access Vulnerability	**7.4%** Illiteracy	**89.6%** Primary School Enrollment	**66.7%** Households without Internet	**11.7%** Households without TV	**38.4%** Households without Radio	**8.9** Average years of Schooling	
Economic Constraints	**49.7** Economic Dependency Ratio	**28.3%** Population in Poverty	**29.3%** CEP Beneficiaries				
Gender Inequality	**38.9%** Female Seats in Government	**1.0** Female to Male Years of Schooling	**0.29** Female to Male Labor Ratio				
Population Pressures	**0.79%** Average Annual Population Change	**0.71%** Average Annual Urban Population Change					

[33] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[34] Rank: 1 of 32 Provinces (Score: 0.639) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Governance** The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

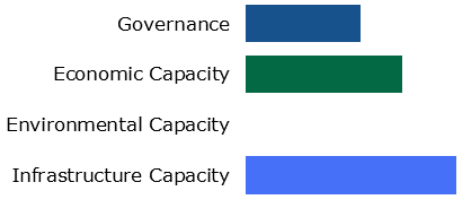


Table 35. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.04** Debt to Service Ratio	**94.2%** Employment Rate (Male)	**RD$ 59,392** Average Annual Income per Capita			
Governance	**64.1%** Registered Voter Participation (2016 Election)	**18.2** Homicide Rate per 100k persons	**92.1%** Households with Garbage Collection			
Environmental Capacity	**0%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**15.8** Hospital Beds per 10,000 Persons	**29.2** Nurses per 10,000 Persons	**51.8** Physicians per 10,000 Persons	**0.5 km** Average Distance to Nearest Hospital	**0.77** Vaccination Index[35]
Communications Capacity	**50.1%** Households with Access to Fixed Phone Line	**85.1%** Households with Access to Mobile Phone			
Transportation Capacity	**3.5 km** Average Distance to Nearest Port or Airport	**14.1 km** Total Length of Road per km^2 (area)			

[34] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[35] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[36] Rank: 32 of 32 Provinces (Score: 0.257)

Distrito Nacional's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Distrito Nacional has the lowest Vulnerability and the highest Coping Capacity, indicating high overall resilience.

Table 36. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity	**Governance**	**Vulnerable Health Status**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[37] Rank: 30 of 32 Provinces (Score: 0.426)

Distrito Nacional's score and ranking are due to very high Multi-Hazard Exposure combined with very low Vulnerability and very high Coping Capacity scores.

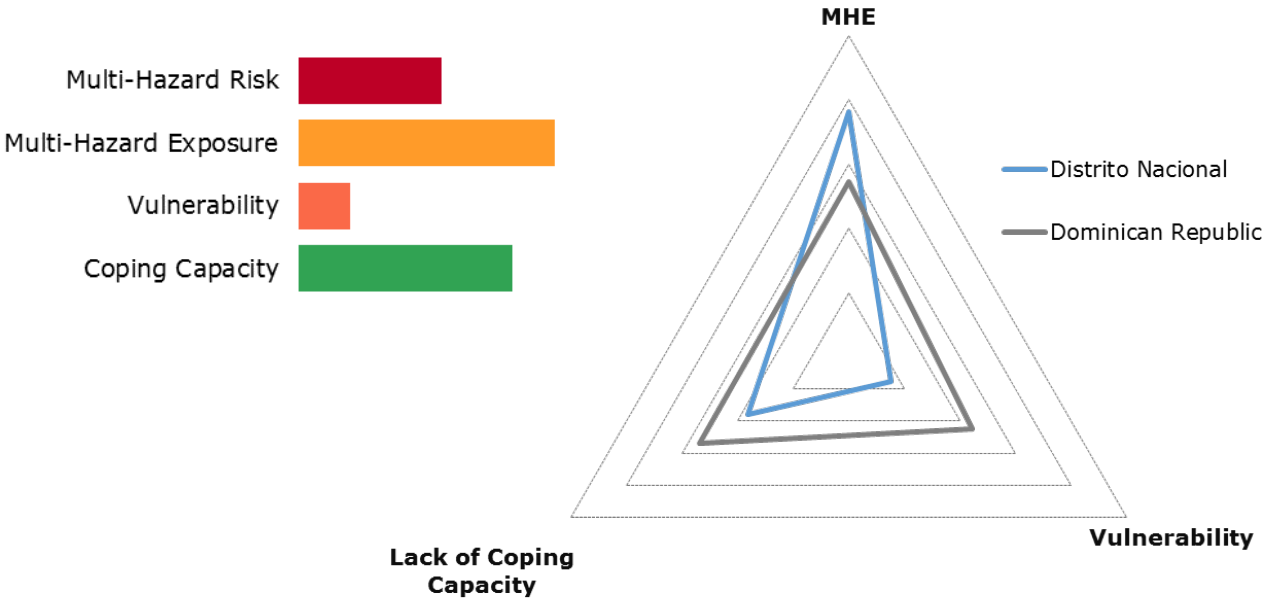


Figure 34. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[36] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[37] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Lowest environmental stress
Ranked 32 of 32 provinces, low environmental stress indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

High information access
High information access indicates that the population has an increased ability to access and comprehend disaster-related information before, during, and after events.

Highest overall coping capacity
Ranking 1 of 32 provinces, high coping capacity indicates the province's ability, using existing skills and resources, to face and manage adverse conditions, emergencies, or disasters.

Recommendations

01

Improve environmental capacity
Invest in protected areas to reduce environmental stress and degradation.

02

Reduce vulnerable health status
Invest in public welfare services to decrease malnutrition, support the disabled population, and decrease infant and maternal mortality.

03

Improve governance
Provide additional support for local police, firefighters, and emergency medical resources to improve public safety and reduce crime rates. In addition, seek partnerships with the private sector to increase the provision of services, such as garbage collection.

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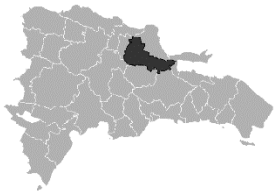
Duarte

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Duarte

Province Capital: San Francisco de Macorís



Area: 1,861 km^2

Duarte is located in the central north of the country and is an important agricultural producer of cacao and rice.

296,558
Population
(2017)

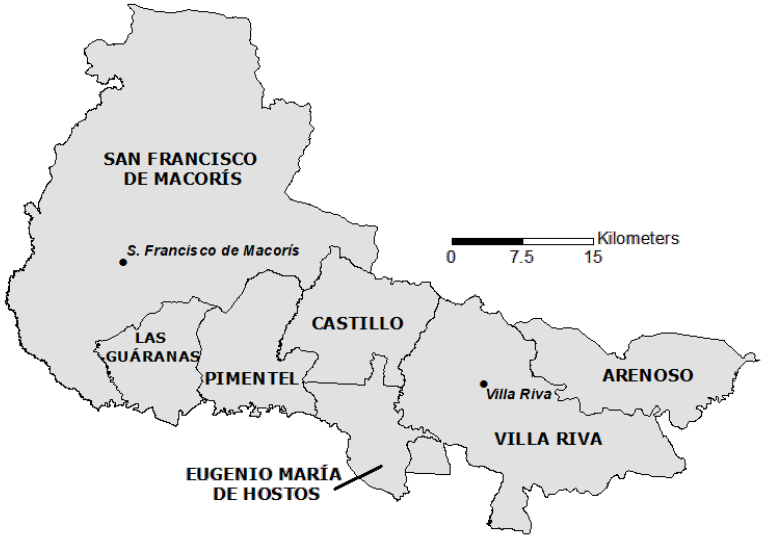
41.7%
Population in Poverty

13.9%
Illiterate Population

14.2
Infant Mortality Rate

74.5%
Access to Improved Water

Municipality	Population
San Francisco De Macorís	192,669
Arenoso	14,396
Castillo	16,086
Pimentel	18,293
Villa Riva	34,469
Las Guaranás	15,015
Eugenio Maria De Hostos	5,630



Multi-Hazard Risk Rank: Very High (1 of 32)

Lack of Resilience Rank: Medium (19 of 32)

RVA Component Scores

Table 37. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		**Medium**		**Very High**		**Low**		**Low**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.588	1	0.487	19	0.792	4	0.395	22	0.422	24

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[38] Rank: 4 of 32 Provinces (Score: 0.792)

Table 38. Estimated ambient population[39] exposed to each hazard

Cyclone

100%

341,759 People

Earthquake

100%

341,759 People

Landslide

64%

218,764 People

Flood

78%

267,178 People

Tsunami

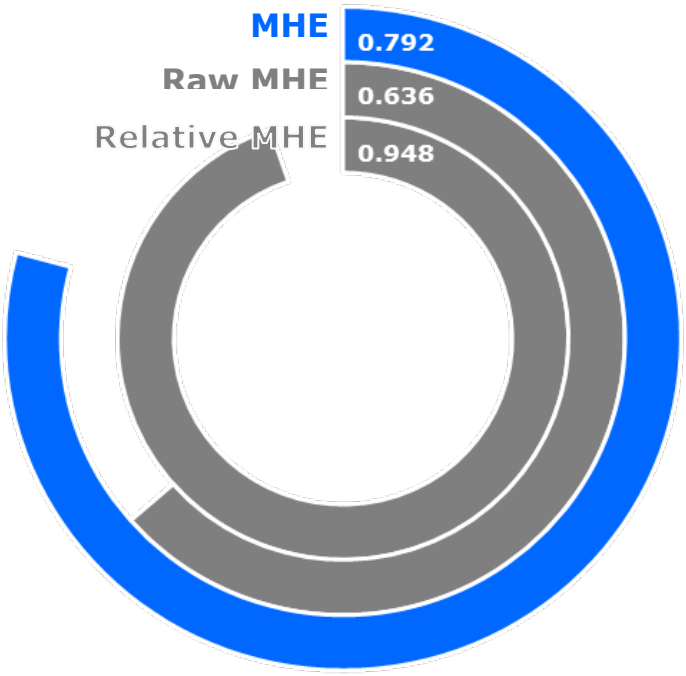
0%

0 People

Case Study: Cacao Enterprises in Duarte

Rich in cacao, the Duarte province has been hard hit by extreme weather events in the past two years. Major flooding, landslides, and storm impacts have significantly lowered cacao production and quality with delayed and shortened harvest seasons. Cacao producers in the province are working to increase their resilience to hazards through environmentally conscientious growing practices, trainings, microfinance loans, and local partnerships.

"*Origin Report: Öko Caribe, Dominican Republic" – Uncommon Cacao, 23 May 2018*



[38] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[39] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[40] Rank: 22 of 32 Provinces (Score: 0.395)
Though Vulnerability in Duarte is relatively low, the province ranks highest in the country in **Gender Inequality**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

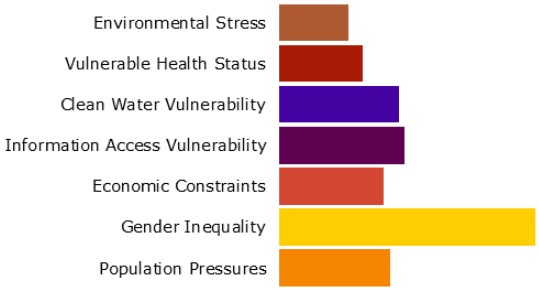


Table 39. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-0.6%** Average Annual Forest Change					
Vulnerable Health Status	**14.2** Infant Mortality Rate	**59.1** Maternal Mortality Rate	**8.9** Chronic Malnutrition	**7.3%** Population Disabled			
Clean Water Vulnerability	**25.5%** Households without Access to Improved Water	**6.6%** Households without Access to Flush Toilets					
Information Access Vulnerability	**13.9%** Illiteracy	**84.8%** Primary School Enrollment	**91.2%** Households without Internet	**21.0%** Households without TV	**49.1%** Households without Radio	**6.6** Average years of Schooling	
Economic Constraints	**53.8** Economic Dependency Ratio	**41.7%** Population in Poverty	**41.9%** CEP Beneficiaries				
Gender Inequality	**34.5%** Female Seats in Government	**1.2** Female to Male Years of Schooling	**0.52** Female to Male Labor Ratio				
Population Pressures	**0.29%** Average Annual Population Change	**2.0%** Average Annual Urban Population Change					

[40] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[41] Rank: 24 of 32 Provinces (Score: 0.422) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Governance**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

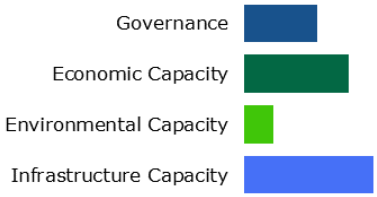


Table 40. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.99** Debt to Service Ratio	**92.8%** Employment Rate (Male)	**RD$ 21,874** Average Annual Income per Capita			
Governance	**71.5%** Registered Voter Participation (2016 Election)	**23.8** Homicide Rate per 100k persons	**62.2%** Households with Garbage Collection			
Environmental Capacity	**9.0%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**13.5** Hospital Beds per 10,000 Persons	**29.6** Nurses per 10,000 Persons	**21.9** Physicians per 10,000 Persons	**2.8 km** Average Distance to Nearest Hospital	**0.5** Vaccination Index[42]
Communications Capacity	**19.1%** Households with Access to Fixed Phone Line	**77.0%** Households with Access to Mobile Phone			
Transportation Capacity	**33.2 km** Average Distance to Nearest Port or Airport	**0.61 km** Total Length of Road per km^2 (area)			

[41] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[42] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[43] Rank: 19 of 32 Provinces (Score: 0.487)

Duarte's score and ranking are due to low Vulnerability combined with low Coping Capacity scores. Duarte ranks 22nd in Vulnerability and 24th in Coping Capacity.

Table 41. The 3 Thematic areas with the Weakest Relative Scores

Gender Inequality	**Governance**	**Environmental Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[44] Rank: 1 of 32 Provinces (Score: 0.588)

Duarte's score and ranking are driven by a combination of very high Multi-Hazard Exposure, low Vulnerability, and low Coping Capacity scores.

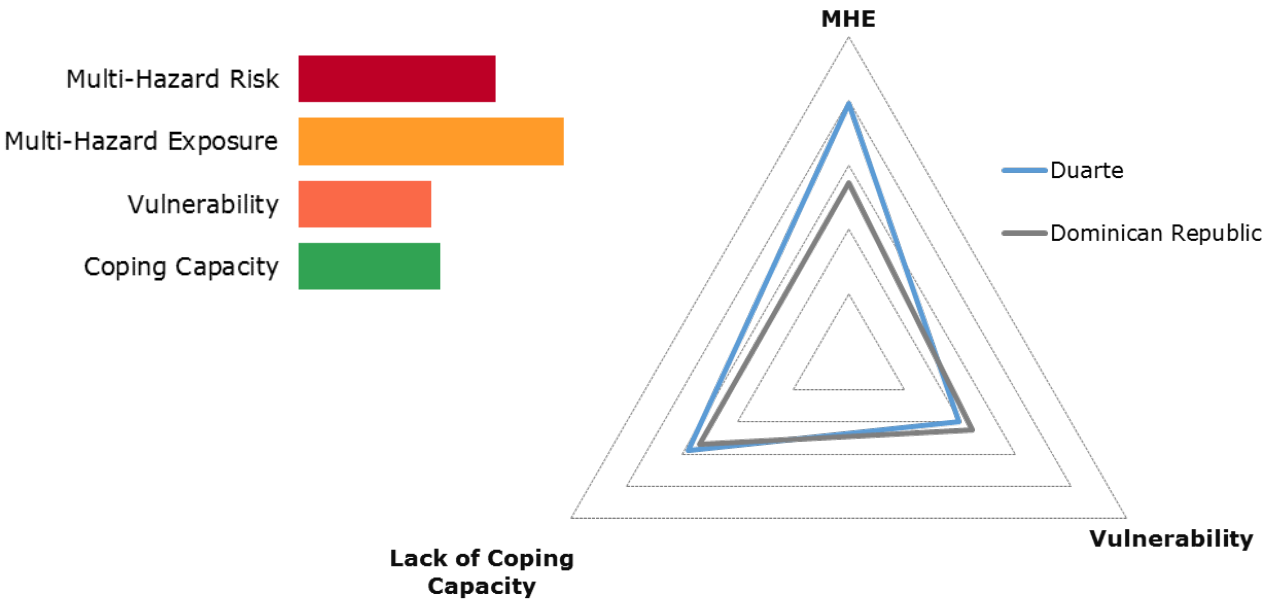


Figure 35. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[43] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[44] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low vulnerable health status
Ranked 27 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Low environmental stress
Ranked 28 of 32 provinces, low environmental stress indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

High health care capacity
Ranked 6 of 32 provinces, high health care capacity indicates that the population will have access to healthcare services before, during, and after a disaster.

Recommendations

01

Promote gender equality
Support equal-educational enrollment at all levels; access to the labor market, wages, and credit; and political representation to reduce vulnerability.

02

Improve governance
Provide additional support for local police, firefighters, and emergency medical resources to improve public safety and reduce crime rates. In addition, seek partnerships with the private sector to increase the provision of services, such as garbage collection.

03

Improve environmental capacity
Invest in protected areas to reduce environmental stress and degradation.

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El Seibo

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: El Seibo

Province Capital: Santa Cruz de El Seibo

Area: 2,008 km^2

El Seibo is located in the east of the country. The region yields cacao, coffee, sugarcane and corn crops in addition to beeswax and livestock.

91,826
Population
(2017)

69.1%
Population in Poverty

20.4%
Illiterate Population

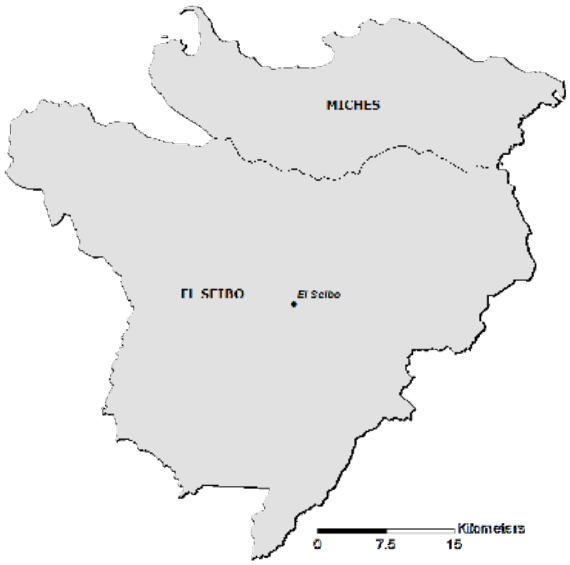
6.1
Infant Mortality Rate

75.7%
Access to Improved Water

Municipality	Population
El Seibo	70,026
Miches	21,800

Multi-Hazard Risk Rank: Very High (2 of 32)

Lack of Resilience Rank: Very High (3 of 32)



RVA Component Scores

Table 42. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		**Very High**		**Low**		**Very High**		**Very Low**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.584	2	0.648	3	0.458	22	0.601	5	0.305	31

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[45] Rank: 22 of 32 Provinces (Score: 0.458)

Table 43. Estimated ambient population[46] exposed to each hazard

Cyclone

100%

108,184 People

Earthquake

100%

108,184 People

Landslide

57%

61,165 People

Flood

13%

13,603 People

Tsunami

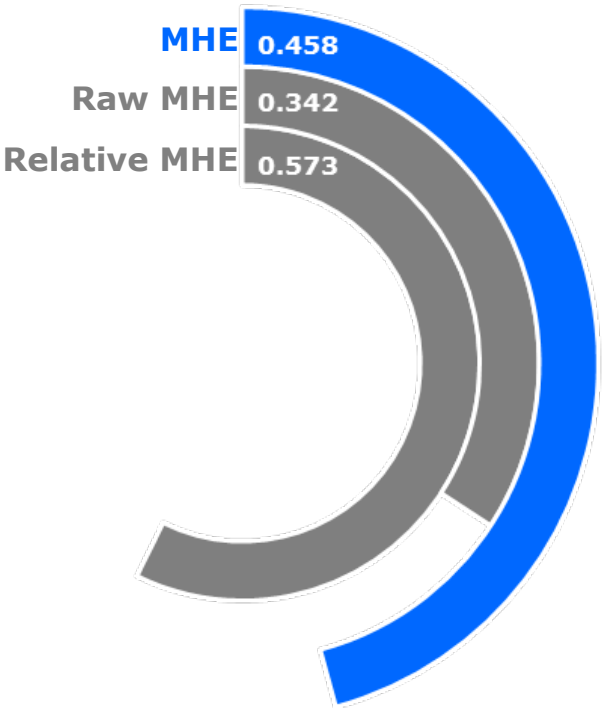
7%

7,251 People

Case Study: Community Preparedness in El Seibo

In 2008, El Seibo collaborated with World Vision to implement a Disaster Risk Reduction and Disaster Preparedness project in the province. This led to the development of Community Disaster Preparedness and Response Committees which enhanced the province's capacity to respond to disasters at both the local level and across borders. In 2010, these Committees actively coordinated to bring aid to neighboring Haiti after the devastating earthquake. Communication and coordination mechanisms were strengthened across the province as a result of these Committees.

"Dominican Republic: World Vision Disaster Preparedness Committees Help Haiti" – World Vision International, 3 February 2010



[45] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[46] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[47] Rank: 5 of 32 Provinces (Score: 0.601) Vulnerability in El Seibo is strongly influenced by **Gender Inequality, Information Access Vulnerability,** and **Clean Water Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

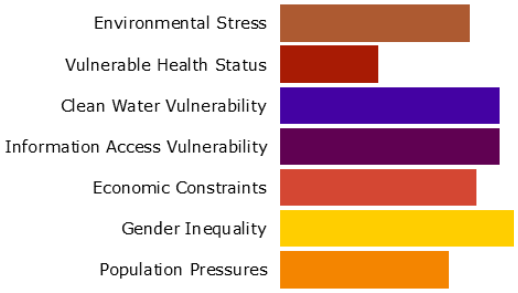


Table 44. Component Scores for each Vulnerability Sub-component

Environmental Stress	**20.1%** Province Susceptible to Drought	**-15.8%** Average Annual Forest Change					
Vulnerable Health Status	**6.1** Infant Mortality Rate	**101.9** Maternal Mortality Rate	**11.1** Chronic Malnutrition	**9.1%** Population Disabled			
Clean Water Vulnerability	**24.3%** Households without Access to Improved Water	**22.4%** Households without Access to Flush Toilets					
Information Access Vulnerability	**20.4%** Illiteracy	**83.7%** Primary School Enrollment	**96.5%** Households without Internet	**44.1%** Households without TV	**59.6%** Households without Radio	**5.1** Average years of Schooling	
Economic Constraints	**66.7** Economic Dependency Ratio	**69.1%** Population in Poverty	**38.9%** CEP Beneficiaries				
Gender Inequality	**36.7%** Female Seats in Government	**1.2** Female to Male Years of Schooling	**0.58** Female to Male Labor Ratio				
Population Pressures	**0.62%** Average Annual Population Change	**4.2%** Average Annual Urban Population Change					

[47] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[48] Rank: 31 of 32 Provinces (Score: 0.305) El Seibo ranks very low across many thematic areas in with its weakest relative scores in **Environmental Capacity, Governance** and **Infrastructure**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

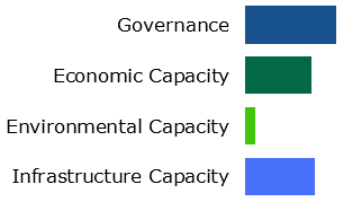


Table 45. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.02** Debt to Service Ratio	**90.9%** Employment Rate (Male)	**RD$ 19,967** Average Annual Income per Capita			
Governance	**77.4%** Registered Voter Participation (2016 Election)	**21.1** Homicide Rate per 100k persons	**50.1%** Households with Garbage Collection			
Environmental Capacity	**3.3%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**10.6** Hospital Beds per 10,000 Persons	**15.5** Nurses per 10,000 Persons	**16.1** Physicians per 10,000 Persons	**4.1 km** Average Distance to Nearest Hospital	**0.31** Vaccination Index[49]	
Communications Capacity	**8.3%** Households with Access to Fixed Phone Line	**59.8%** Households with Access to Mobile Phone				
Transportation Capacity	**37.7 km** Average Distance to Nearest Port or Airport	**0.47 km** Total Length of Road per km^2 (area)				

[48] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[49] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[50] Rank: 3 of 32 Provinces (Score: 0.648)

El Seibo's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. El Seibo ranks 5th in Vulnerability and 31st in Coping Capacity.

Table 46. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity

Gender Inequality

Governance

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[51] Rank: 2 of 32 Provinces (Score: 0.584)

El Seibo's score and ranking are a product of low Multi-Hazard Exposure combined with very high Vulnerability and very low Coping Capacity.

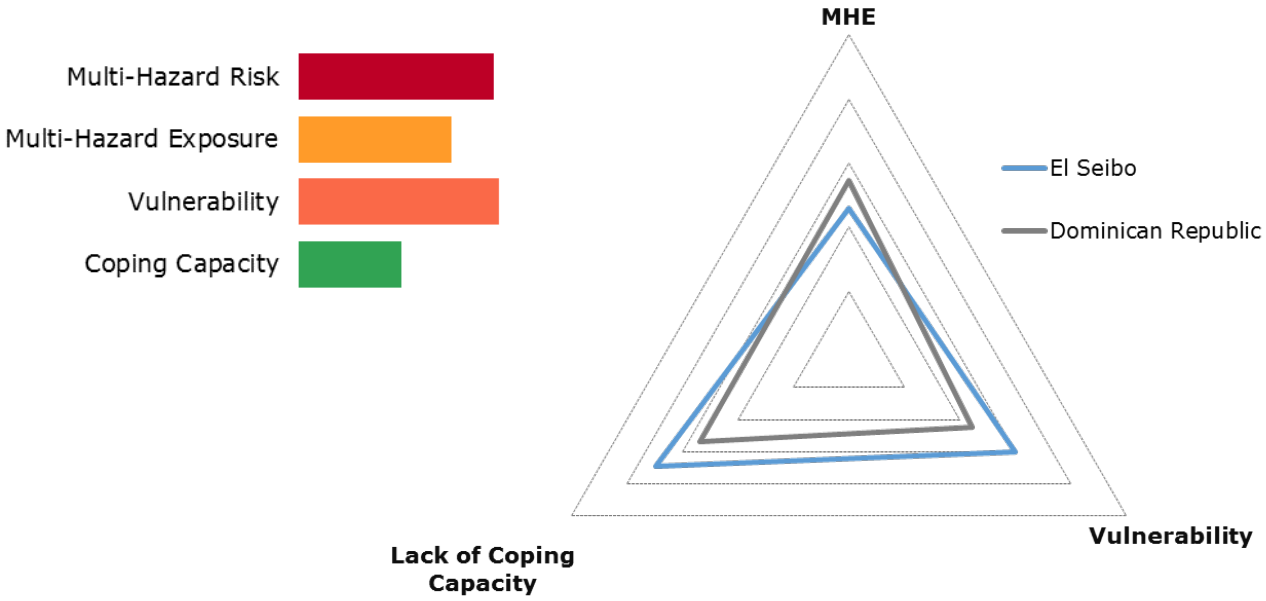


Figure 36. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[50] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[51] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low vulnerable health status

Ranked 26 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Recommendations

01

Improve environmental capacity

Invest in protected areas to reduce environmental stress and degradation.

02

Promote gender equality

Reduce inequality, ensuring that vulnerable populations have their needs met under 'normal' conditions and are less susceptible to disaster impacts.

03

Improve governance

Provide additional support for local police, firefighters, and emergency medical resources to improve public safety and reduce crime rates. In addition, seek partnerships with the private sector to increase the provision of services, such as garbage collection.

Better solutions.
Fewer disasters.
Safer world.

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Elías Piña

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Elías Piña

Province Capital: Comendador

Area: 1,567 km^2

Elías Piña, also called Comendador, is located in western Dominican Republic near the border with Haiti. The economy is mainly based on livestock and agriculture including sugarcane, cotton, coffee and fruit.

63,438
Population
(2017)

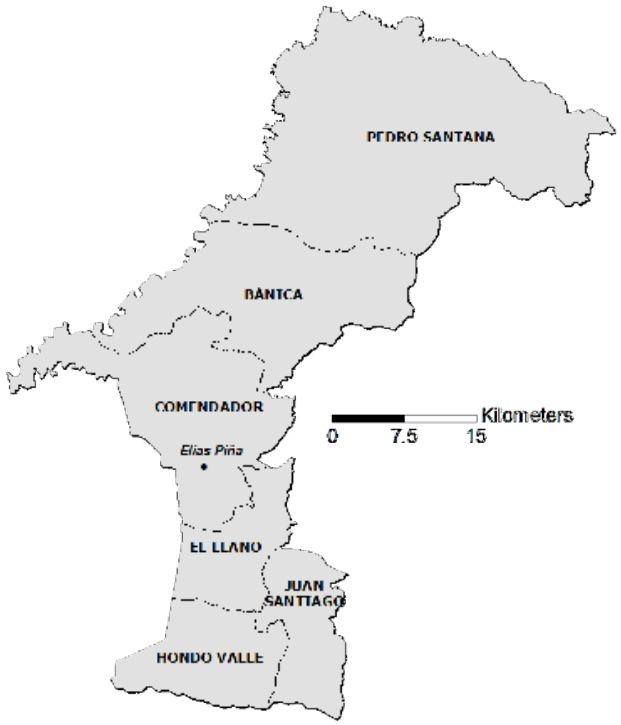
83.8%
Population in Poverty

35.8%
Illiterate Population

13.9
Infant Mortality Rate

73.6%
Access to Improved Water

Municipality	Population
Comendador	26,077
Bánica	6,574
El Llano	8,399
Hondo Valle	10,659
Pedro Santana	7,336
Juan Santiago	4,393



Multi-Hazard Risk Rank: Low (24 of 32)

Lack of Resilience Rank: Very High (1 of 32)

RVA Component Scores

Table 47. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		Very High		Very Low		Very High		Very Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.490	24	0.682	1	0.105	32	0.606	4	0.242	32

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[52] Rank: 32 of 32 Provinces (Score: 0.105)

Table 48. Estimated ambient population[53] exposed to each hazard

Cyclone

100%

92,668 People

Earthquake

9%

7,987 People

Landslide

61%

56,419 People

Flood

5%

4,386 People

Tsunami

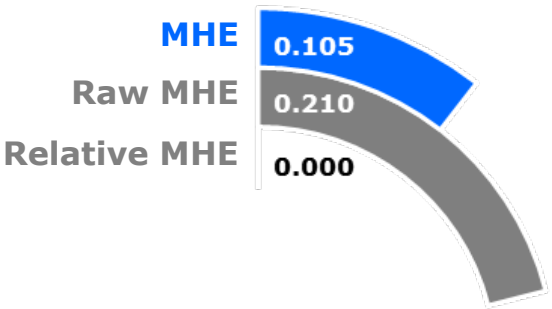
0%

0 People

Case Study: Improving Health and Relations at the Border

The province of Elías Piña sits within a few miles of the river which separates the Dominican Republic from neighboring Haiti. Despite being the poorest province in the country, Elías Piña still works to aid its neighbor. Through organization like Socios En Salud and the Dominican Ministry of Health, Haitians are able to access health care, community outreach, and testing for HIV in the Dominican border town. The province of Elías Piña understands how inextricably linked the Dominican Republic is with its western neighbor, and actively serves as a strong example of how to increase community resilience across borders.

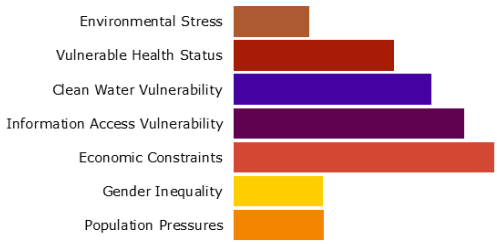
"Crossing Rivers—and Cultural Bounds—in the Dominican Republic" – Partners in Health, 23 May 2013



[52] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[53] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)



Vulnerability[54] Rank: 4 of 32 Provinces (Score: 0.606)
Vulnerability in Elías Piña is very strongly influenced by **Economic Constraints, Information Access Vulnerability,** and **Clean Water Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

Table 49. Component Scores for each Vulnerability Sub-component

Environmental Stress	**4.6%** Province Susceptible to Drought	**-2.1%** Average Annual Forest Change					
Vulnerable Health Status	**13.9** Infant Mortality Rate	**NO DATA** Maternal Mortality Rate	**22.7** Chronic Malnutrition	**7.4%** Population Disabled			
Clean Water Vulnerability	**26.4%** Households without Access to Improved Water	**24.3%** Households without Access to Flush Toilets					
Information Access Vulnerability	**35.8%** Illiteracy	**88.5%** Primary School Enrollment	**98.3%** Households without Internet	**58.3%** Households without TV	**68.5%** Households without Radio	**4.1** Average years of Schooling	
Economic Constraints	**88.2** Economic Dependency Ratio	**83.8%** Population in Poverty	**57.6%** CEP Beneficiaries				
Gender Inequality	**39.8%** Female Seats in Government	**1.04** Female to Male Years of Schooling	**0.50** Female to Male Labor Ratio				
Population Pressures	**0.05%** Average Annual Population Change	**3.9%** Average Annual Urban Population Change					

[54] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[55] Rank: 32 of 32 Provinces (Score: 0.242) Elías Piña's weakest relative scores are in **Economic Capacity** and **Infrastructure (Transportation and Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

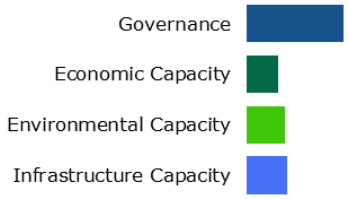


Table 50. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.93** Debt to Service Ratio	**86.4%** Employment Rate (Male)	**RD$ 11,070** Average Annual Income per Capita			
Governance	**78.3%** Registered Voter Participation (2016 Election)	**17.3** Homicide Rate per 100k persons	**40.2%** Households with Garbage Collection			
Environmental Capacity	**11.9%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**18.9** Hospital Beds per 10,000 Persons	**25.7** Nurses per 10,000 Persons	**15.6** Physicians per 10,000 Persons	**4.9 km** Average Distance to Nearest Hospital	**0.65** Vaccination Index[56]
Communications Capacity	**3.4%** Households with Access to Fixed Phone Line	**54.2%** Households with Access to Mobile Phone			
Transportation Capacity	**69.6 km** Average Distance to Nearest Port or Airport	**0.23 km** Total Length of Road per km^2 (area)			

[55] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[56] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[57] Rank: 1 of 32 Provinces (Score: 0.682)

Elías Piña's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. Elías Piña has the 4th highest Vulnerability and the lowest Coping Capacity.

Table 51. The 3 Thematic areas with the Weakest Relative Scores

Economic Constraints

Communications Infrastructure Capacity

Transportation Infrastructure Capacity

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[58] Rank: 24 of 32 Provinces (Score: 0.490)

Elías Piña's score and ranking are driven primarily by the combination of very high Vulnerability with very low Coping Capacity.

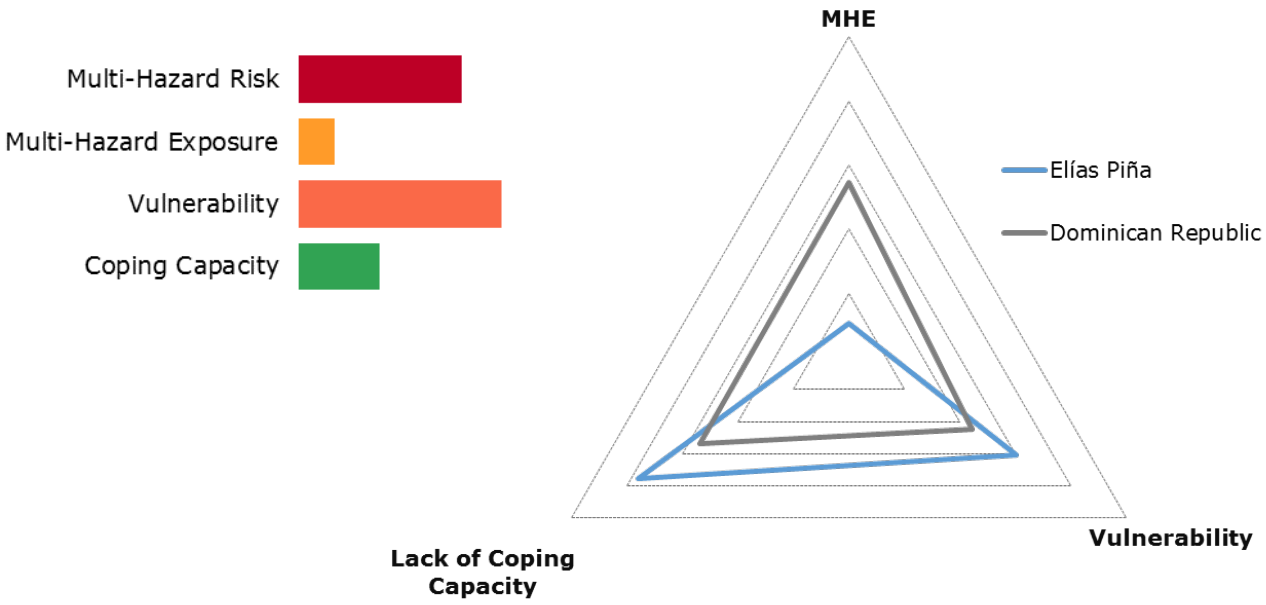


Figure 37. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[57] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[58] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low gender inequality

Ranked 31 of 32 provinces, low gender inequality indicates that vulnerable populations are more likely to have their needs met under 'normal' conditions and may be less susceptible during times of disaster.

Recommendations

01

Alleviate economic constraints

Focus investments to reduce poverty and encourage business development and education programs to increase stable and viable economic opportunities in the region.

02

Invest in infrastructure

Limited infrastructure inhibits the capacity to communicate and exchange information, reduces access to health care and limits the physical distribution of goods and services. Health care, transportation, and communication infrastructures require upgrading and investment to increase connectivity and welfare in the province. Focused investments in these areas will increase coping capacity and resilience.

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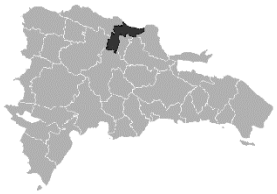
Espailalat

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Espaillat

Province Capital: Moca



Area: 953 km^2

Espaillat is a coastal province is located in the North-Central region of the country known for ecotourism and agricultural outputs including yuca, root crops, poultry and swine.

237,855
Population
(2017)

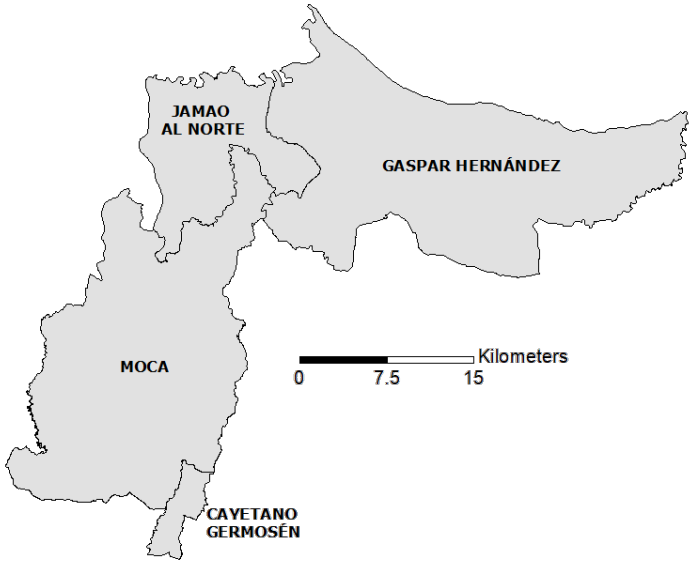
33.0%
Population in Poverty

13.2%
Illiterate Population

17.3
Infant Mortality Rate

76.1%
Access to Improved Water

Municipality	Population
Moca	184,027
Cayetano Germosén	7,073
Gaspar Hernandez	38,249
Jamao Al Norte	8,506



Multi-Hazard Risk Rank: Very High (5 of 32)

Lack of Resilience Rank: Low (21 of 32)

RVA Component Scores

Table 52. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		Low		Very High		Low		Medium	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.561	5	0.453	21	0.779	5	0.356	24	0.451	20

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[59] Rank: 5 of 32 Provinces (Score: 0.779)

Table 53. Estimated ambient population[60] exposed to each hazard

Cyclone

100%

270,809 People

Earthquake

100%

270,809 People

Landslide

66%

178,840 People

Flood

75%

203,992 People

Tsunami

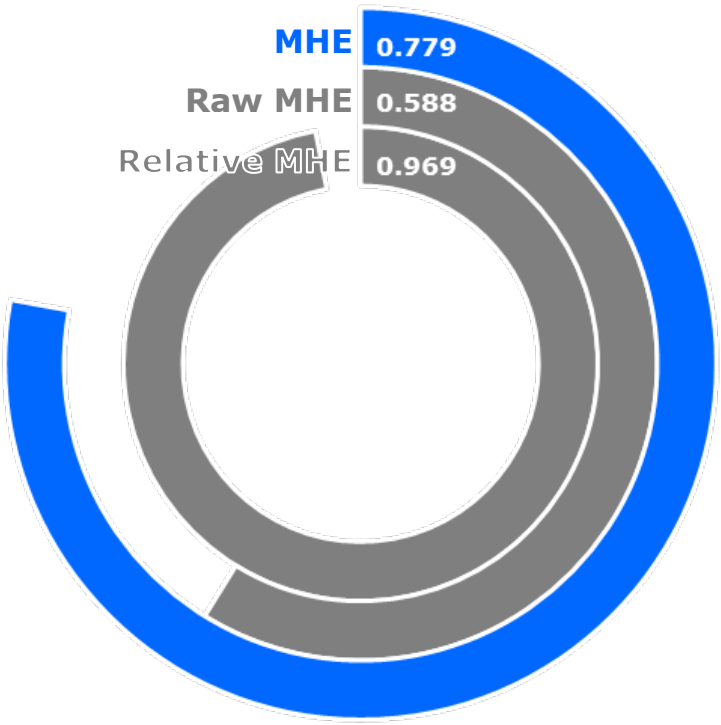
5%

12,582 People

Case Study: A National Flooding Emergency in Espaillat

In November 2016, the Dominican Republic received several weeks of heavy rain, resulting in mass displacement due to extensive flooding and landslides in several provinces. Espaillat was one of the most affected provinces, with the city of Gaspar Hernandez recording 223.5 mm of rainfall in 24 hours. A national emergency was declared for the province by the country's President on November 13th. The province remained on red alert for the duration of November.

"Dominican Republic – 18,000 Remain Displaced by Floods, National Emergency Declared" – Floodlist, 16 November 2016



[59] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[60] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[61] Rank: 24 of 32 Provinces (Score: 0.356) Though Vulnerability in Espaillat is relatively low, the index is influenced by moderate scores in **Gender Inequality, Population Pressures,** and **Clean Water Vulnerability.** The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

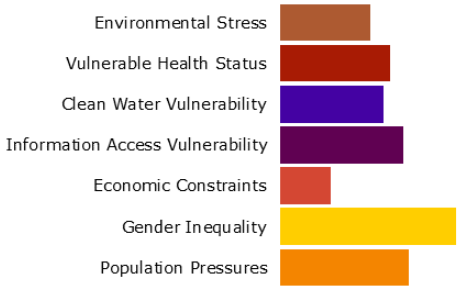


Table 54. Component Scores for each Vulnerability Sub-component

	Environmental Stress	**0%** Province Susceptible to Drought	**-2.6%** Average Annual Forest Change				
	Vulnerable Health Status	**17.3** Infant Mortality Rate	**77.3** Maternal Mortality Rate	**10.9** Chronic Malnutrition	**6.8%** Population Disabled		
	Clean Water Vulnerability	**23.9%** Households without Access to Improved Water	**5.0%** Households without Access to Flush Toilets				
	Information Access Vulnerability	**13.2%** Illiteracy	**80.7%** Primary School Enrollment	**91.1%** Households without Internet	**17.4%** Households without TV	**45.4%** Households without Radio	**6.6** Average years of Schooling
	Economic Constraints	**51.5** Economic Dependency Ratio	**33.0%** Population in Poverty	**31.7%** CEP Beneficiaries			
	Gender Inequality	**37.0%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.50** Female to Male Labor Ratio			
	Population Pressures	**0.31%** Average Annual Population Change	**3.0%** Average Annual Urban Population Change				

[61] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[62] Rank: 20 of 32 Provinces (Score: 0.451) The thematic areas with the weakest relative scores are **Environmental Capacity, Health Care Capacity,** and **Governance**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

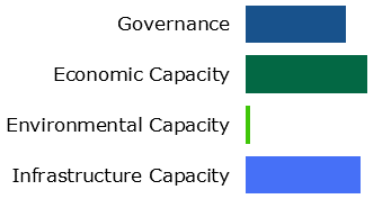


Table 55. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.92** Debt to Service Ratio	**94.9%** Employment Rate (Male)	**RD$ 19,394** Average Annual Income per Capita			
Governance	**75.2%** Registered Voter Participation (2016 Election)	**22.1** Homicide Rate per 100k persons	**65.8%** Households with Garbage Collection			
Environmental Capacity	**1.4%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**8.8** Hospital Beds per 10,000 Persons	**16.5** Nurses per 10,000 Persons	**11.7** Physicians per 10,000 Persons	**3.3 km** Average Distance to Nearest Hospital	**0.30** Vaccination Index[63]
Communications Capacity	**16.3%** Households with Access to Fixed Phone Line	**79.9%** Households with Access to Mobile Phone			
Transportation Capacity	**24.2 km** Average Distance to Nearest Port or Airport	**073 km** Total Length of Road per km^2 (area)			

[62] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[63] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[64] Rank: 21 of 32 Provinces (Score: 0.453)

Espaillat's score and ranking are due to low Vulnerability combined with low Coping Capacity scores. Espaillat 24th in Vulnerability and 20th in Coping Capacity.

Table 56. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity	**Health Care Infrastructure Capacity**	**Governance**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[65] Rank: 5 of 32 Provinces (Score: 0.561)

Espaillat's score and ranking are due to very high Multi-Hazard Exposure combined with low Vulnerability and Coping Capacity.

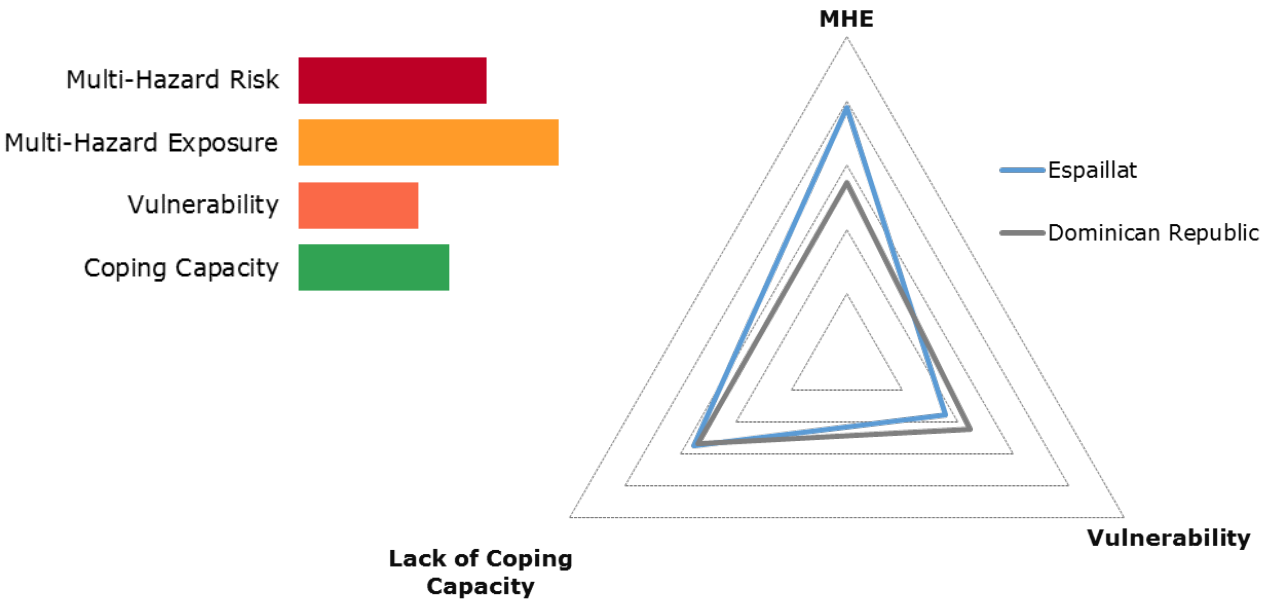


Figure 38. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[64] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[65] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High economic capacity

Ranked 10 of 32 provinces, high economic capacity indicates that Espaillat may be able to invest in additional mitigation and preparedness measures at the local and community level.

Low economic constraints

Ranked 27 of 32 provinces, low economic constraints indicate that Espaillat may be able to invest in additional mitigation and preparedness measures at the local and community level.

Recommendations

01

Improve environmental capacity

Invest in protected areas to reduce environmental stress and degradation.

02

Build health care capacity

Focus investments to increase access to health care and preventative medicine, as well as transportation to improve connectivity and ensure that health services can be reached by the entire population.

03

Improve governance

Provide additional support for local police, firefighters, and emergency medical resources to improve public safety and reduce crime rates. In addition, seek partnerships with the private sector to increase the provision of services, such as garbage collection.

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Hato Mayor

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Hato Mayor

Province Capital: Hato Mayor del Rey

Area: 1,482 km^2

Located in the east of the country, Hato Mayor is known for its great historic and geological value including the protected area of Refugio de la Vida Silvestre Manglar de la Jina.

85,653
Population
(2017)

61.5%
Population in Poverty

16.0%
Illiterate Population

13.5
Infant Mortality Rate

55.3%
Access to Improved Water

Municipality	Population
Hato Mayor	61,981
Sabana De La Mar	16,388
El Valle	7,284

Multi-Hazard Risk Rank: Medium (16 of 32)

Lack of Resilience Rank: High (10 of 32)

RVA Component Scores

Table 57. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Medium		High		Medium		High		Medium	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.525	16	0.518	10	0.539	19	0.496	11	0.461	19

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[66] Rank: 19 of 32 Provinces (Score: 0.539)

Table 58. Estimated ambient population[67] exposed to each hazard

Cyclone
100%
106,114 People

Earthquake
100%
106,114 People

Landslide
56%
59,161 People

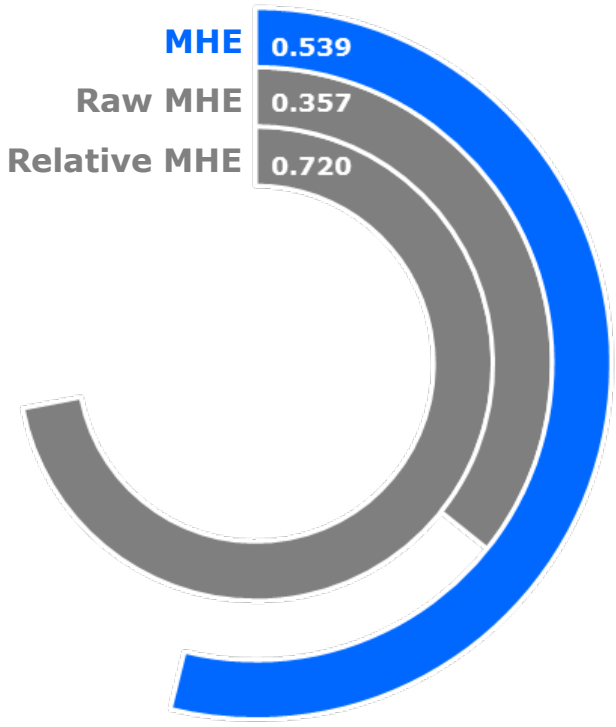
Flood
34%
35,632 People

Tsunami
12%
13,230 People

Case Study: Hurricane Maria Rescues in Hato Mayor

When Hurricane Maria hit the east coast of the Dominican Republic on September 21st, 2017, many people living within the province of Hato Mayor found themselves stranded by the rising floodwaters. Master guides from two Adventist churches in the province helped to rescue "dozens of people, including children and the elderly." Through coordination and rapid action, the master guides were able to pull people to safety at a neighboring church. With the military and fire department unable to access the town in time, local-level emergency response efforts became integral to the survival of many in the province.

"In the Dominican Republic, Master Guides Rescue Dozens from Flood Waters During Hurricane Maria" – Adventist News Network, 26 September 2017



[66] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[67] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[68] Rank: 11 of 32 Provinces (Score: 0.496) Vulnerability in Hato Mayor is influenced by **Clean Water Vulnerability, Gender Inequality,** and **Vulnerable Health Status.** The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

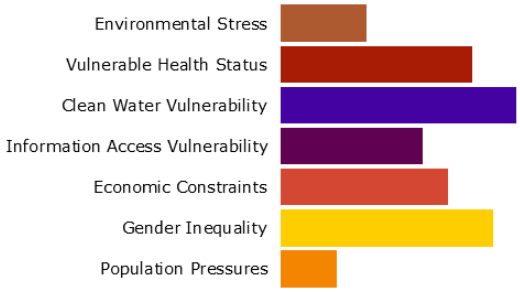


Table 59. Component Scores for each Vulnerability Sub-component

Environmental Stress	**1.7%** Province Susceptible to Drought	**-2.0%** Average Annual Forest Change					
Vulnerable Health Status	**13.5** Infant Mortality Rate	**246.2** Maternal Mortality Rate	**9.8** Chronic Malnutrition	**11.4%** Population Disabled			
Clean Water Vulnerability	**44.7%** Households without Access to Improved Water	**13.5%** Households without Access to Flush Toilets					
Information Access Vulnerability	**16.0%** Illiteracy	**96.1%** Primary School Enrollment	**94.5%** Households without Internet	**28.0%** Households without TV	**57.3%** Households without Radio	**6.1** Average years of Schooling	
Economic Constraints	**58.8** Economic Dependency Ratio	**61.5%** Population in Poverty	**44.4%** CEP Beneficiaries				
Gender Inequality	**37.3%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.52** Female to Male Labor Ratio				
Population Pressures	**0.06%** Average Annual Population Change	**0.9%** Average Annual Urban Population Change					

[68] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[69] Rank: 19 of 32 Provinces (Score: 0.461) The thematic areas with the weakest relative scores are **Infrastructure (Transportation and Communications)** and **Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

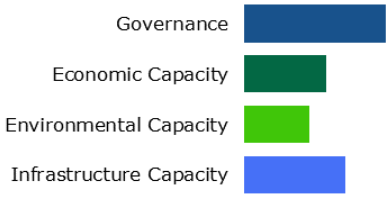


Table 60. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.00** Debt to Service Ratio	**92.1%** Employment Rate (Male)	**RD$ 18,446** Average Annual Income per Capita			
Governance	**76.7%** Registered Voter Participation (2016 Election)	**14.0** Homicide Rate per 100k persons	**65.0%** Households with Garbage Collection			
Environmental Capacity	**19.9%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.9** Hospital Beds per 10,000 Persons	**15.2** Nurses per 10,000 Persons	**24.9** Physicians per 10,000 Persons	**5.0 km** Average Distance to Nearest Hospital	**0.76** Vaccination Index[70]	
Communications Capacity	**9.9%** Households with Access to Fixed Phone Line	**71.4%** Households with Access to Mobile Phone				
Transportation Capacity	**27.0 km** Average Distance to Nearest Port or Airport	**0.40 km** Total Length of Road per km^2 (area)				

[69] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[70] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[71] Rank: 10 of 32 Provinces (Score: 0.518)

Hato Mayor's score and ranking are due to high Vulnerability combined with moderate Coping Capacity scores. Hato Mayor ranks 11th in Vulnerability and 19th in Coping Capacity.

Table 61. The 3 Thematic areas with the Weakest Relative Scores

Clean Water Vulnerability	**Vulnerable Health Status**	**Transportation Infrastructure Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[72] Rank: 16 of 32 Provinces (Score: 0.525)

Hato Mayor's score and ranking are due to moderate Multi-Hazard Exposure combined with high Vulnerability and moderate Coping Capacity.

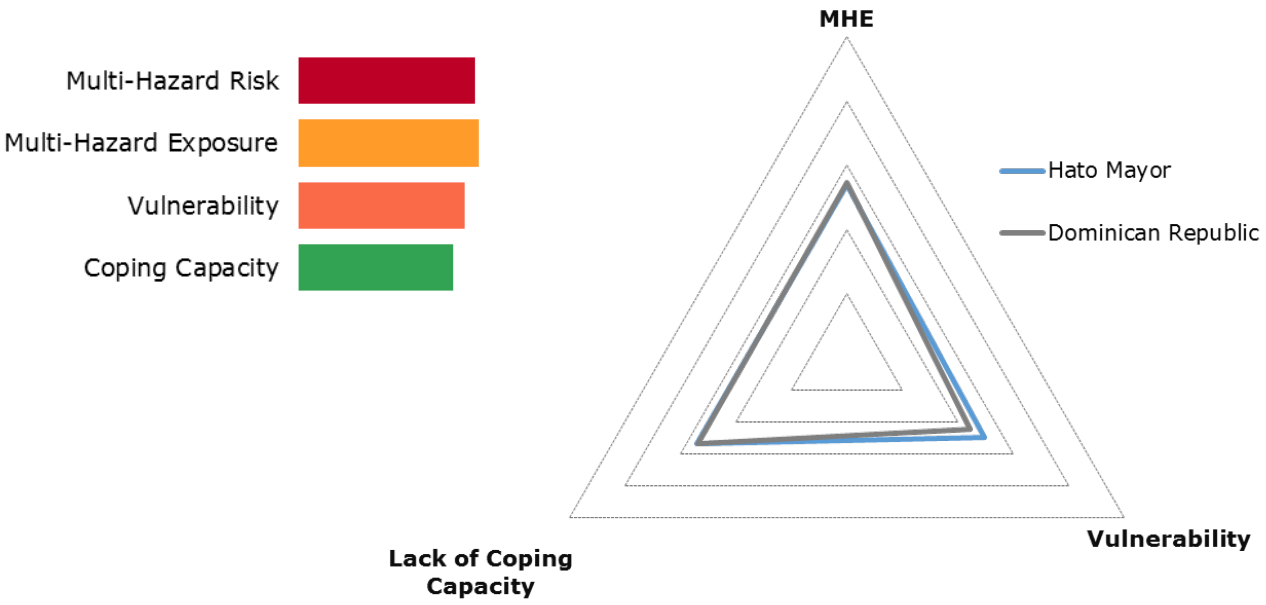


Figure 39. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[71] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[72] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High overall governance
Ranked 6 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Low population pressures
Ranked 31 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Recommendations

01

Reduce clean water vulnerability
Invest in public water and sewer infrastructure to ensure equitable access to safe, clean drinking water and sanitation.

02

Reduce vulnerable health status
Invest in public welfare services to decrease malnutrition, support the disabled population, and decrease infant and maternal mortality.

03

Increase transportation capacity
Invest in transportation networks to facilitate the movement of goods and services, decreasing wait times for response and relief supplies.

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Hermanas Mirabal

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Hermanas Mirabal

Province Capital: Salcedo

Area:483 km^2

Hermanas Mirabal province is located in the central north of the country and includes humid sub-tropical forests. Its economy is mainly agriculturally based including banana, cassava, cocoa and coffee.

92,311
Population
(2017)

36.4%
Population in Poverty

14.4%
Illiterate Population

14.4
Infant Mortality Rate

54.8%
Access to Improved Water

Municipality	Population
Salcedo	39,613
Tenares	27,798
Villa Tapia	24,900

Multi-Hazard Risk Rank: High (9 of 32)

Lack of Resilience Rank: Low (9 of 32)

RVA Component Scores

Table 62. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		Low		High		Low		High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.538	9	0.453	22	0.707	8	0.392	23	0.486	11

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[73] Rank: 8 of 32 Provinces (Score: 0.707)

Table 63. Estimated ambient population[74] exposed to each hazard

Cyclone

100%

118,680 People

Earthquake

100%

118,680 People

Landslide

69%

82,395 People

Flood

82%

97,340 People

Tsunami

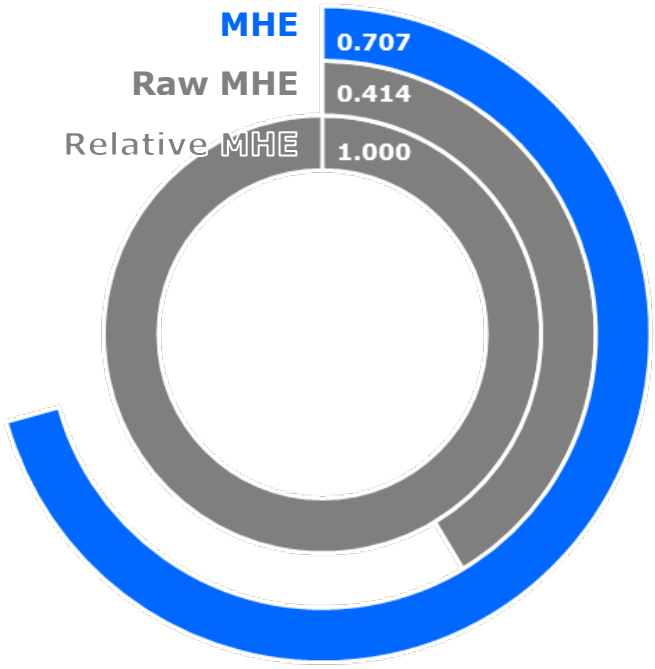
0%

0 People

Case Study: Climate Shock Vulnerability in Hermanas Mirabal

A 2018 joint study completed by the United Nations World Food Program (WFP) and the Dominican Republic's Ministry of Economy, Planning and Development (MEPyD) found that seventy-seven municipalities in the country are "vulnerable to climate-related shocks," including Hermanas Mirabal. Information from the study will be used to plan and implement programs aimed at increasing the resilience of the population. Increasing social protection and risk reduction initiatives will be additional outcomes of the study.

"Study: 77 Municipalities Vulnerable to Climate Shocks" – Dominican Today, 3 August 2018



[73] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[74] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[75] Rank: 23 of 32 Provinces (Score: 0.392) Vulnerability in Hermanas Mirabal is influenced by **Clean Water Vulnerability, Gender Inequality,** and **Vulnerable Health Status.** The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

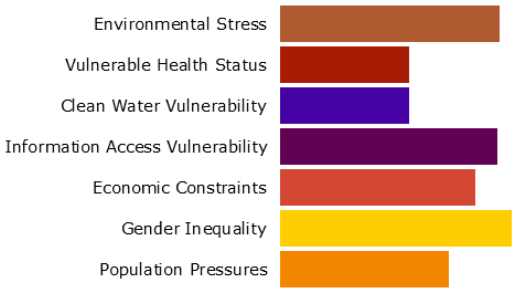


Table 64. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-0.9%** Average Annual Forest Change					
Vulnerable Health Status	**14.4** Infant Mortality Rate	**299.9** Maternal Mortality Rate	**10.5** Chronic Malnutrition	**5.8%** Population Disabled			
Clean Water Vulnerability	**45.2%** Households without Access to Improved Water	**3.4%** Households without Access to Flush Toilets					
Information Access Vulnerability	**14.4%** Illiteracy	**85.1%** Primary School Enrollment	**93.2%** Households without Internet	**18.1%** Households without TV	**45.2%** Households without Radio	**6.8** Average years of Schooling	
Economic Constraints	**55.8** Economic Dependency Ratio	**36.4%** Population in Poverty	**37.4%** CEP Beneficiaries				
Gender Inequality	**41.0%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.50** Female to Male Labor Ratio				
Population Pressures	**0.03%** Average Annual Population Change	**1.9%** Average Annual Urban Population Change					

[75] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[76] Rank: 11 of 32 Provinces (Score: 0.486) Hermanas Mirabal exhibits notable weaknesses in the thematic areas of **Environmental Capacity** and **Governance**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

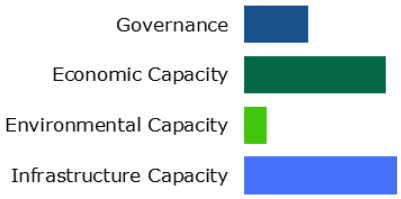


Table 65. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.72** Debt to Service Ratio	**93.1%** Employment Rate (Male)	**RD$ 20,319** Average Annual Income per Capita			
Governance	**72.1%** Registered Voter Participation (2016 Election)	**20.6** Homicide Rate per 100k persons	**43.5%** Households with Garbage Collection			
Environmental Capacity	**6.9%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**28.4** Hospital Beds per 10,000 Persons	**53.9** Nurses per 10,000 Persons	**25.6** Physicians per 10,000 Persons	**2.5 km** Average Distance to Nearest Hospital	**0.50** Vaccination Index[77]
Communications Capacity	**19.0%** Households with Access to Fixed Phone Line	**75.5%** Households with Access to Mobile Phone			
Transportation Capacity	**26.5 km** Average Distance to Nearest Port or Airport	**0.86 km** Total Length of Road per km^2 (area)			

[76] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[77] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[78] Rank: 22 of 32 Provinces (Score: 0.453)

Hermanas Mirabel's score and ranking are due to low Vulnerability combined with high Coping Capacity scores. Hermanas Mirabal ranks 23rd in Vulnerability and 11th in Coping Capacity.

Table 66. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity

Governance

Gender Inequality

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[79] Rank: 9 of 32 Provinces (Score: 0.538)

Hermanas Mirabal's score and ranking are due to high Multi-Hazard Exposure combined with low Vulnerability and high Coping Capacity.

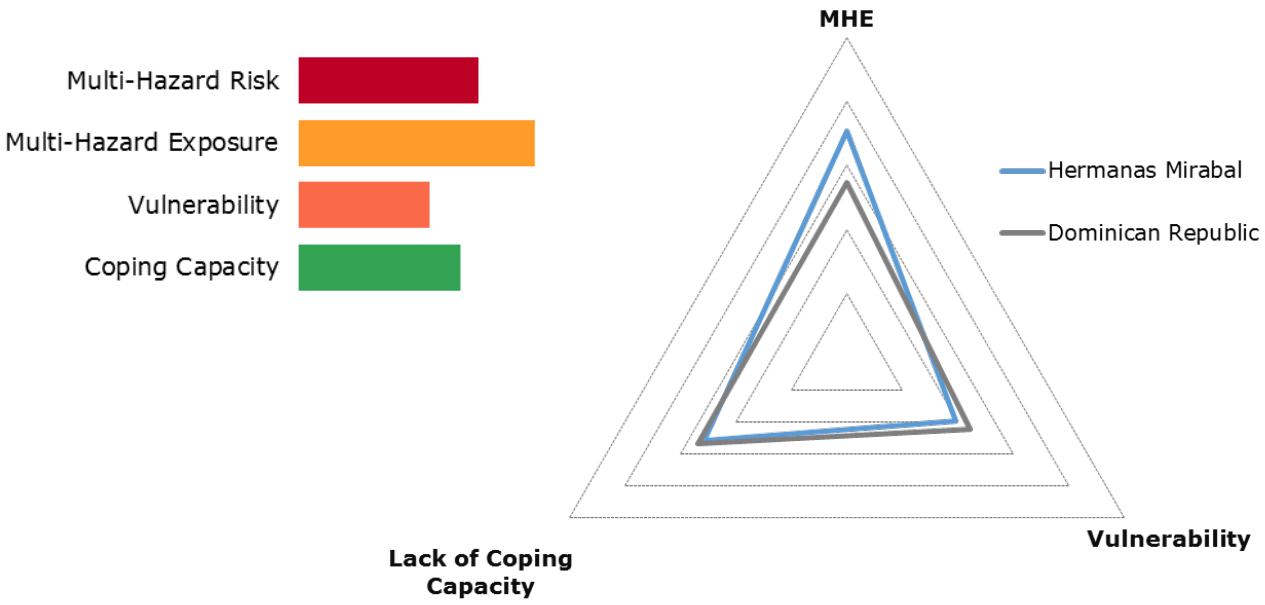


Figure 40. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[78] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[79] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low economic constraints
Ranked 22 of 32 provinces, low economic constraints indicate an increased ability to invest in mitigation and preparedness measures at the individual, household, and provincial level.

High overall infrastructure capacity
Ranked 4 of 32 provinces, well developed infrastructure – communication, health care, transportation - facilitates the exchange of information, and physical distribution of goods and services to the population.

Low population pressures
Ranked 29 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Recommendations

01

Improve environmental capacity
Invest in protected areas to reduce environmental stress and degradation.

02

Promote gender equality
Reduce inequality, ensuring that vulnerable populations have their needs met under 'normal' conditions and are less susceptible to disaster impacts.

03

Improve governance
Provide additional support for local police, firefighters, and emergency medical resources to improve public safety and reduce crime rates. In addition, seek partnerships with the private sector to increase the provision of services, such as garbage collection.

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Independencia

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

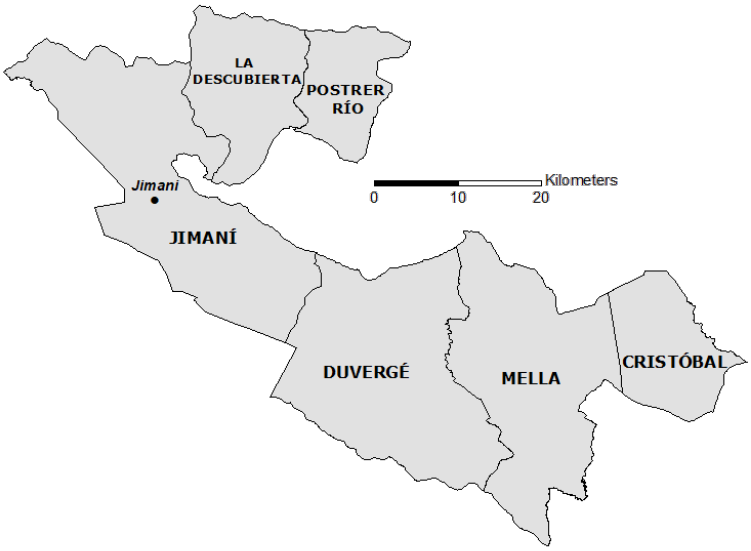
Province: Independencia

Province Capital: Jimaní

Area: 1,975 km^2

Independencia is located in western Dominican Republic near the border with Haiti and is known for its mountains, import/export with Haiti, and agriculture.

Municipality	Population
Jimaní	17,829
Duvergé	12,984
La Descubierta	8,965
Postrer Rio	6,116
Cristóbal	6,942
Mella	3,927



Multi-Hazard Risk Rank: High (12 of 32)

Lack of Resilience Rank: Very High (4 of 32)

RVA Component Scores

Table 67. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		Very High		Very Low		Very High		Very Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.531	12	0.618	4	0.356	27	0.635	2	0.399	27

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[80] Rank: 27 of 32 Provinces (Score: 0.356)

Table 68. Estimated ambient population[81] exposed to each hazard

Cyclone

100%

66,594 People

Earthquake

66%

44,027 People

Landslide

57%

38,236 People

Flood

37%

24,613 People

Tsunami

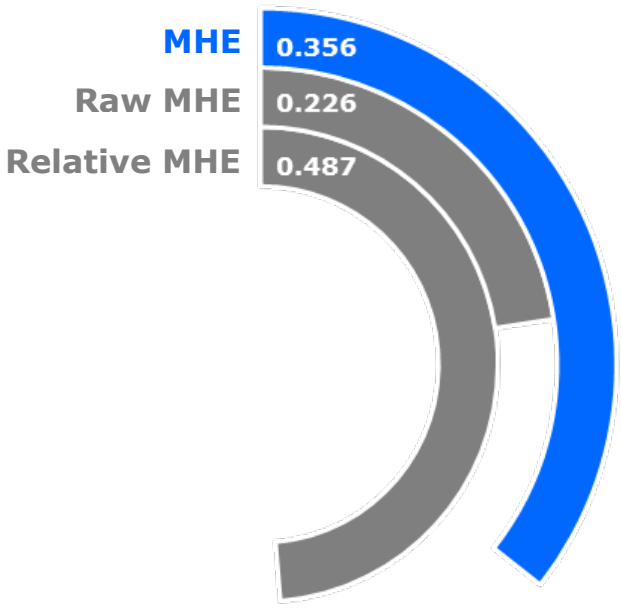
0%

0 People

Case Study: Flooding in Independencia

The province of Independencia experienced a significant flooding event in May of 2004 which resulted in devastating losses. Independencia's town of Jimaní, located on the border with Haiti, suffered the deaths of nearly four hundred people after the disaster event. "Many of the affected persons in the border region… were Haitian immigrants, most undocumented." Impacts were equally devastating on the Haitian side of the border. Relief efforts were "well-orchestrated and swift," and required effective coordination to manage response operations in both Haiti and the Dominican Republic.

"*Dominican Republic & Haiti: Floods" – IFRC, 28 February 2005*



[80] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[81] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[82] Rank: 2 of 32 Provinces (Score: 0.635)
Vulnerability in Independencia is strongly influenced by **Information Access Vulnerability, Economic Constraints,** and **Environmental Stress**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

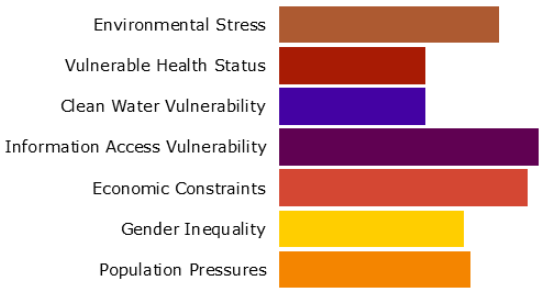


Table 69. Component Scores for each Vulnerability Sub-component

Environmental Stress	**88.2%** Province Susceptible to Drought	**-1.8%** Average Annual Forest Change					
Vulnerable Health Status	**10.2** Infant Mortality Rate	**272.5** Maternal Mortality Rate	**11.3** Chronic Malnutrition	**7.1%** Population Disabled			
Clean Water Vulnerability	**9.1%** Households without Access to Improved Water	**19.9%** Households without Access to Flush Toilets					
Information Access Vulnerability	**25.9%** Illiteracy	**74.5%** Primary School Enrollment	**97.9%** Households without Internet	**39.3%** Households without TV	**65.5%** Households without Radio	**5.2** Average years of Schooling	
Economic Constraints	**76.5** Economic Dependency Ratio	**73.3%** Population in Poverty	**41.2%** CEP Beneficiaries				
Gender Inequality	**35.6%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.46** Female to Male Labor Ratio				
Population Pressures	**1.1 %** Average Annual Population Change	**4.1%** Average Annual Urban Population Change					

[82] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[83] Rank: 27 of 32 Provinces (Score: 0.399) The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure (Transportation and Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

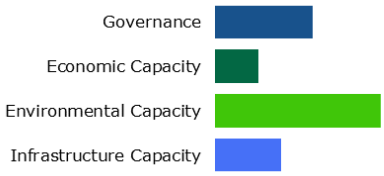


Table 70. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.99** Debt to Service Ratio	**91.0%** Employment Rate (Male)	**RD$ 13,047** Average Annual Income per Capita			
Governance	**84.0%** Registered Voter Participation (2016 Election)	**34.5** Homicide Rate per 100k persons	**65.4%** Households with Garbage Collection			
Environmental Capacity	**57.6%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**21.6** Hospital Beds per 10,000 Persons	**39.4** Nurses per 10,000 Persons	**16.5** Physicians per 10,000 Persons	**4.4 km** Average Distance to Nearest Hospital	**0.95** Vaccination Index[84]	
Communications Capacity	**5.5%** Households with Access to Fixed Phone Line	**55.2%** Households with Access to Mobile Phone				
Transportation Capacity	**44.8 km** Average Distance to Nearest Port or Airport	**0.28 km** Total Length of Road per km^2 (area)				

[83] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[84] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[85] Rank: 4 of 32 Provinces (Score: 0.618)

Independencia's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. Independencia ranks 2nd in Vulnerability and 27th in Coping Capacity.

Table 71. The 3 Thematic areas with the Weakest Relative Scores

Communications Infrastructure Capacity	**Information Access Vulnerability**	**Economic Constraints**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[86] Rank: 12 of 32 Provinces (Score: 0.531)

Independencia's score and ranking are driven primarily by a combination of very high Vulnerability with very low Coping Capacity.

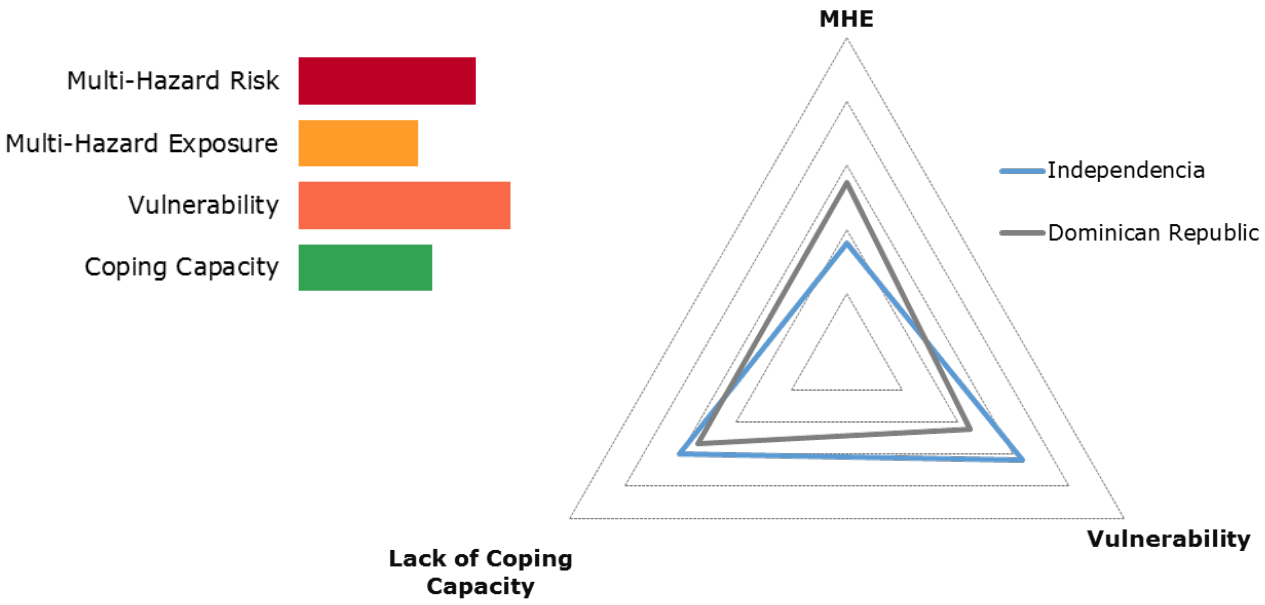


Figure 41. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[85] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[86] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High environmental capacity

Ranked 2 of 32 provinces, high environmental capacity indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Recommendations

01

Invest in communication infrastructure

Invest in communication infrastructure to allow for easier access to information and education material, increasing literacy and situational awareness of the population.

02

Increase economic capacity

Encourage business development and education programs to increase economic opportunities in the region.

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La Altagracia

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: La Altagracia

Province Capital: Salvaleón de Higüey

Area: 3,355 km^2

La Altagracia, the most eastern province in Dominican Republic and its second largest, includes the economically important ecotourism area of Punta Cana.

330,367
Population
(2017)

50.5%
Population in Poverty

13.6%
Illiterate Population

8.1
Infant Mortality Rate

27.4%
Access to Improved Water

Municipality	Population
Higüey	303,820
San Rafael Del Yuma	26,547

Multi-Hazard Risk Rank: High (11 of 32)

Lack of Resilience Rank: High (11 of 32)

RVA Component Scores

Table 72. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		**High**		**Medium**		**High**		**High**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.532	11	0.514	11	0.568	17	0.542	8	0.515	9

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[87] Rank: 17 of 32 Provinces (Score: 0.568)

Table 73. Estimated ambient population[88] exposed to each hazard

Cyclone

100%

220,007 People

Earthquake

100%

220,007 People

Landslide

55%

121,568 People

Flood

24%

51,734 People

Tsunami

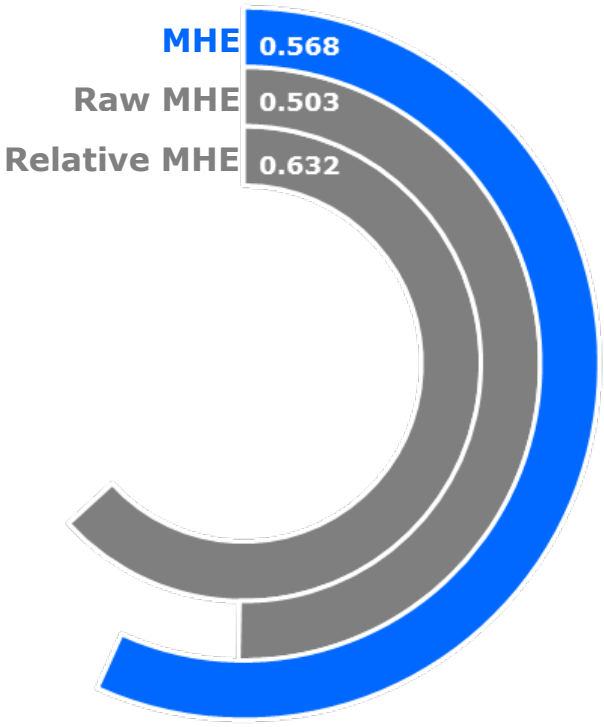
8%

16,542 People

Case Study: Hurricane Irma Impacts and the DRC

The province of La Altagracia was one of the most affected areas of the country after the passage of Hurricane Irma in early September 2017. Following the hurricane, the Dominican Red Cross (DRC) deployed teams to the province to conduct rapid damage assessment and needs analysis (DANA). These DRC teams also supported the UN Country Team and the Dominican Government in conducting a multi-sectorial damage assessment and needs analysis. Through these assessments, the DRC was able to effectively distribute relief supplies to transition the province from response to recovery operations.

"Dominican Republic: Hurricane Irma (MDRDO010) DREF Operation Update" – IFRC, 14 December 2017



[87] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[88] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[89] Rank: 8 of 32 Provinces (Score: 0.542) Vulnerability in La Altagracia is strongly influenced by, **Population Pressures, Environmental Stress,** and **Clean Water Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

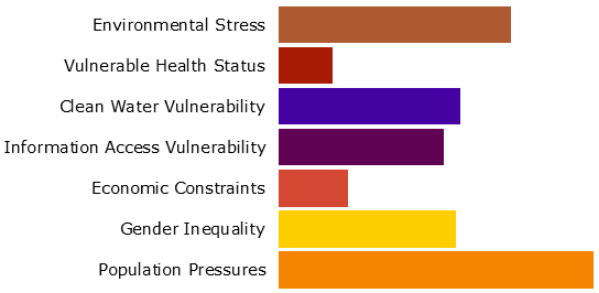


Table 74. Component Scores for each Vulnerability Sub-component

Environmental Stress	**47.8%** Province Susceptible to Drought	**-8.9%** Average Annual Forest Change					
Vulnerable Health Status	**8.1** Infant Mortality Rate	**54.1** Maternal Mortality Rate	**8.3** Chronic Malnutrition	**7.5%** Population Disabled			
Clean Water Vulnerability	**72.6%** Households without Access to Improved Water	**5.0%** Households without Access to Flush Toilets					
Information Access Vulnerability	**13.6%** Illiteracy	**81.2%** Primary School Enrollment	**90.0%** Households without Internet	**31.9%** Households without TV	**61.0%** Households without Radio	**6.4** Average years of Schooling	
Economic Constraints	**53.4** Economic Dependency Ratio	**50.5%** Population in Poverty	**24.5%** CEP Beneficiaries				
Gender Inequality	**27.8%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.42** Female to Male Labor Ratio				
Population Pressures	**2.9%** Average Annual Population Change	**9.7%** Average Annual Urban Population Change					

[89] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[90] Rank: 9 of 32 Provinces (Score: 0.515) The thematic areas with the weakest relative scores are **Governance, Environmental Capacity** and **Infrastructure (Health Care Capacity).** The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

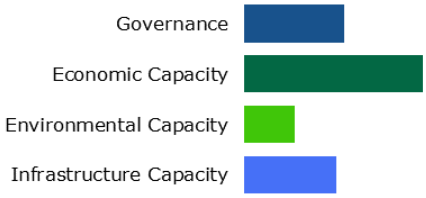


Table 75. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.60** Debt to Service Ratio	**92.0%** Employment Rate (Male)	**RD$ 31,687** Average Annual Income per Capita			
Governance	**70.8%** Registered Voter Participation (2016 Election)	**21.8** Homicide Rate per 100k persons	**75.8%** Households with Garbage Collection			
Environmental Capacity	**15.3%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**4.1** Hospital Beds per 10,000 Persons	**4.5** Nurses per 10,000 Persons	**7.4** Physicians per 10,000 Persons	**5.1 km** Average Distance to Nearest Hospital	**0.88** Vaccination Index[91]
Communications Capacity	**11.0%** Households with Access to Fixed Phone Line	**80.2%** Households with Access to Mobile Phone			
Transportation Capacity	**24.3 km** Average Distance to Nearest Port or Airport	**0.41 km** Total Length of Road per km^2 (area)			

[90] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[91] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[92] Rank: 11 of 32 Provinces (Score: 0.514)

La Altagracia's score and ranking are due to high Vulnerability combined with low Coping Capacity scores. La Altagracia ranks 8th in Vulnerability and 9th in highest Coping Capacity.

Table 76. The 3 Thematic areas with the Weakest Relative Scores

Population Pressures	**Health Care Infrastructure Capacity**	**Environmental Stress**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[93] Rank: 11 of 32 Provinces (Score: 0.532)

La Altagracia's score and ranking are due to moderate Multi-Hazard Exposure combined with high Vulnerability and high Coping Capacity.

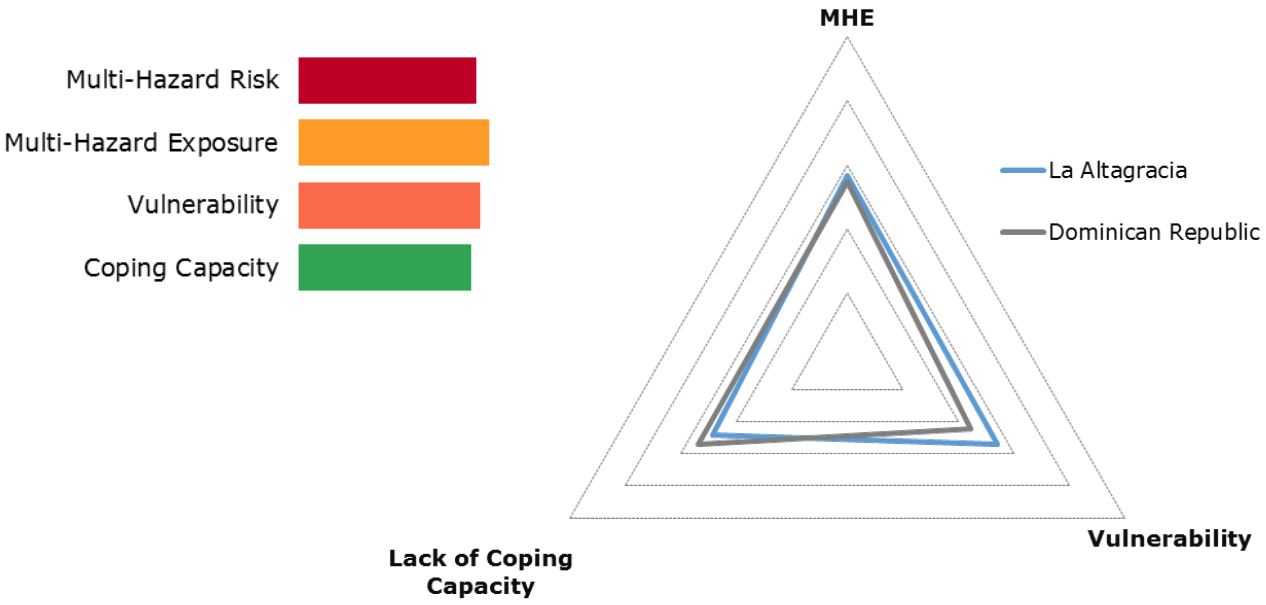


Figure 42. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[92] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[93] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Lowest vulnerable health status
Ranked 32 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Low economic constraints
Ranked 24 of 32 provinces, low economic constraints indicate that La Altagracia may be able to invest in additional mitigation and preparedness measures at the local and community level.

Highest economic capacity
Ranked 1 of 32 provinces, high economic capacity indicates that La Altagracia may be able to invest in additional mitigation and preparedness measures at the local and community level.

Recommendations

01

Reduce Environmental Stress
Invest in drought and erosion mitigation projects to reduce environmental stress and degradation.

02

Increase health care availability
Increase clinics and medical personnel through incentivized programs and investments to increase the health resilience of the population.

03

Reduce population pressure
Rapid population changes are difficult to plan for, and can destabilize social, economic, and environmental systems. Analyze trends in the province to determine potential population changes and increase the update frequency of plans and SOPS to accommodate the changes.

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La Romana

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: La Romana

Province Capital: La Romana

Area: 728 km^2

Located in the southeast of the country, La Romana produces coffee, tobacco, beeswax, cattle and hides. A coastal province, La Romana's port supports the transportation of agriculture outputs and fish.

265,084
Population
(2017)

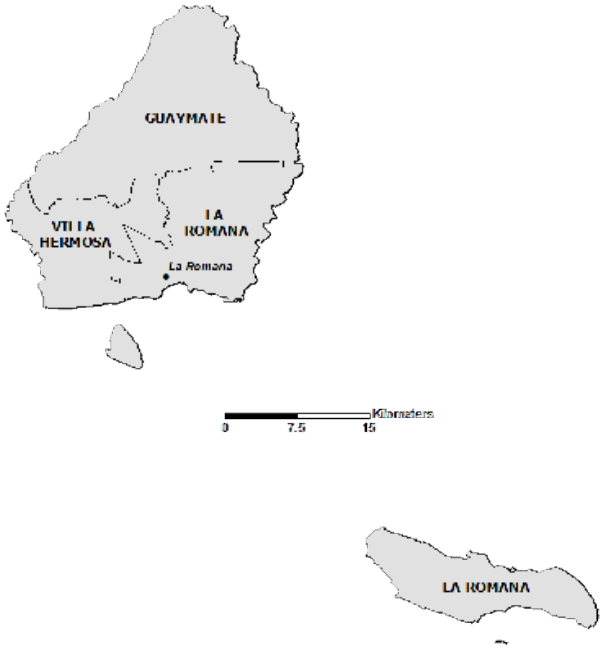
45.0%
Population in Poverty

10.7%
Illiterate Population

10.4
Infant Mortality Rate

88.4%
Access to Improved Water

Municipality	Population
La Romana	150,862
Guaymate	17,880
Villa Hermosa	96,342



Multi-Hazard Risk Rank: Low (22 of 32)

Lack of Resilience Rank: Low (23 of 32)

RVA Component Scores

Table 77. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		Low		High		Medium		High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.497	22	0.442	23	0.608	13	0.412	18	0.528	8

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[94] Rank: 13 of 32 Provinces (Score: 0.608)

Table 78. Estimated ambient population[95] exposed to each hazard

Cyclone

100%

265,549 People

Earthquake

100%

265,549 People

Landslide

64%

171,122 People

Flood

6%

15,690 People

Tsunami

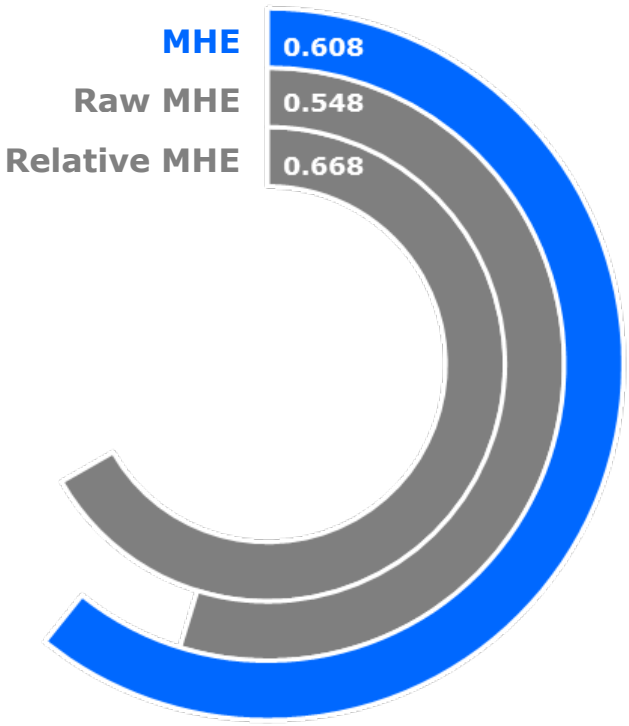
22%

59,710 People

Case Study: Red Alert in the Port of La Romana

Prior to impacts from Hurricane Maria, La Romana's port suspended operations as a result of a "red alert" for extreme weather conditions. La Romana was just one of several ports the Dominican Republic closed in advance of the deadly storm, which followed closely behind Hurricane Irma. With reports of extensive damage on neighboring Caribbean islands, the Dominican Republic proactively worked to prepare provinces like La Romana to ensure a minimal loss of life and property from Hurricane Maria.

"Ports Shut Down as Dominican Republic Braces for Deadly Hurricane Maria" – Pam Wright, The Weather Channel, 20 September 2017



[94] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[95] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[96] Rank: 18 of 32 Provinces (Score: 0.412)
Vulnerability in La Romana is strongly influenced by **Environmental Stress**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

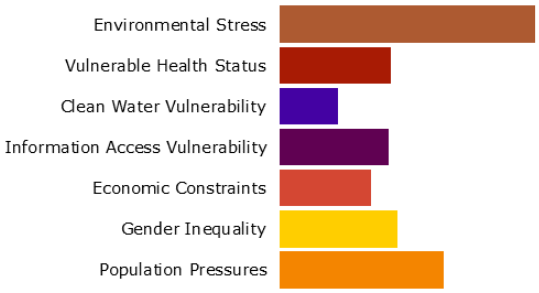


Table 79. Component Scores for each Vulnerability Sub-component

Environmental Stress	**100%** Province Susceptible to Drought	**-3.4%** Average Annual Forest Change					
Vulnerable Health Status	**10.4** Infant Mortality Rate	**175.5** Maternal Mortality Rate	**8.1** Chronic Malnutrition	**8.5%** Population Disabled			
Clean Water Vulnerability	**11.6%** Households without Access to Improved Water	**4.9%** Households without Access to Flush Toilets					
Information Access Vulnerability	**10.7%** Illiteracy	**88.7%** Primary School Enrollment	**88.6%** Households without Internet	**22.9%** Households without TV	**54.0%** Households without Radio	**6.8** Average years of Schooling	
Economic Constraints	**56.7** Economic Dependency Ratio	**45.0%** Population in Poverty	**31.1%** CEP Beneficiaries				
Gender Inequality	**37.3%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.38** Female to Male Labor Ratio				
Population Pressures	**1.08%** Average Annual Population Change	**2.2%** Average Annual Urban Population Change					

[96] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[97] Rank: 8 of 32 Provinces (Score: 0.528) The thematic areas with the weakest relative scores are **Health Care Capacity** and **Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

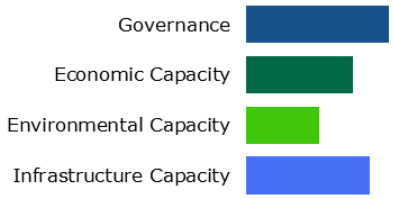


Table 80. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.07** Debt to Service Ratio	**92.4%** Employment Rate (Male)	**RD$ 27,470** Average Annual Income per Capita			
Governance	**73.9%** Registered Voter Participation (2016 Election)	**16.7** Homicide Rate per 100k persons	**81.0%** Households with Garbage Collection			
Environmental Capacity	**22.4%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**4.7** Hospital Beds per 10,000 Persons	**4.7** Nurses per 10,000 Persons	**9.3** Physicians per 10,000 Persons	**3.8 km** Average Distance to Nearest Hospital	**0.88** Vaccination Index[98]
Communications Capacity	**18.5%** Households with Access to Fixed Phone Line	**80.9%** Households with Access to Mobile Phone			
Transportation Capacity	**12.5 km** Average Distance to Nearest Port or Airport	**0.76 km** Total Length of Road per km^2 (area)			

[97] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[98] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[99] Rank: 23 of 32 Provinces (Score: 0.442)

La Romana's score and ranking are due to moderate Vulnerability combined with high Coping Capacity scores. La Romana ranks 18th in Vulnerability and 8th in Coping Capacity.

Table 81. The 3 Thematic areas with the Weakest Relative Scores

Environmental Stress	**Health Care Capacity**	**Environmental Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[100] Rank: 22 of 32 Provinces (Score: 0.497)

La Romana's score and ranking are due to moderate Multi-Hazard Exposure combined with moderate Vulnerability and high Coping Capacity

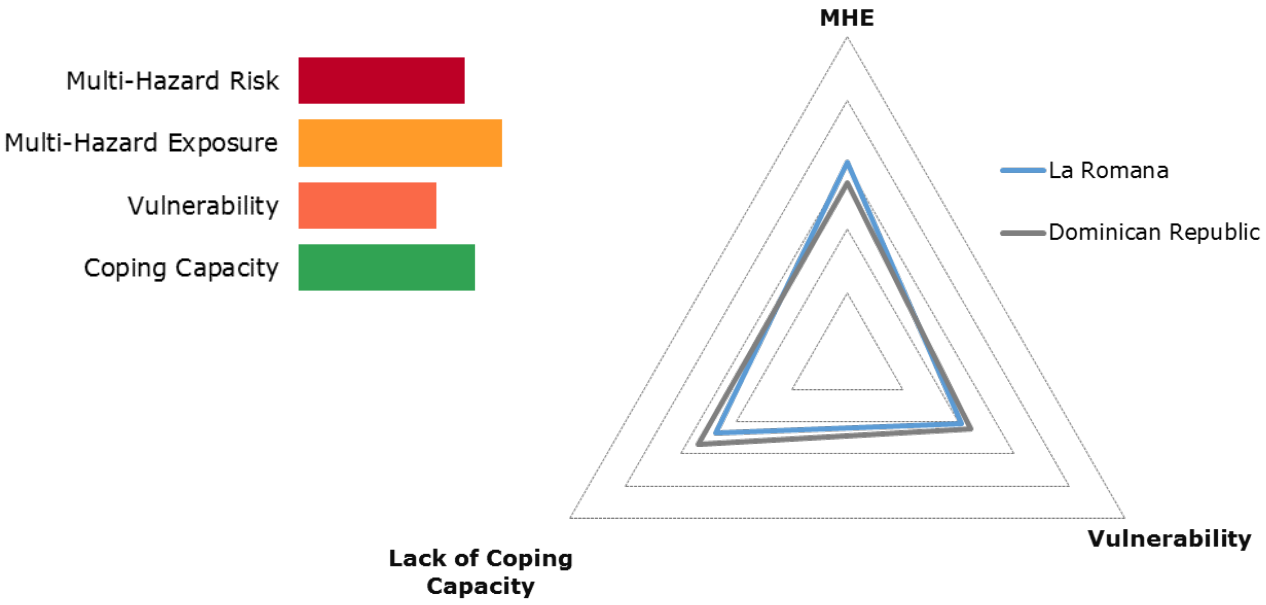


Figure 43. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[99] **Lack of Resilience**: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[100] **Multi-Hazard Risk**: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Highest overall governance
Ranked 5 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Low gender inequality
Ranked 29 of 32 provinces, low gender inequality indicates that vulnerable populations are more likely to have their needs met under 'normal' conditions and may be less susceptible during times of disaster.

High information access
High information access indicates that the population has an increased ability to access and comprehend disaster-related information before, during, and after events.

Recommendations

01

Reduce environmental stress
Invest in drought and erosion mitigation projects to reduce environmental stress and degradation.

02

Increase health care availability
Increase clinics and medical personnel through incentivized programs and investments to increase the health resilience of the population.

03

Increase environmental programs
Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

Better solutions.
Fewer disasters.
Safer world.

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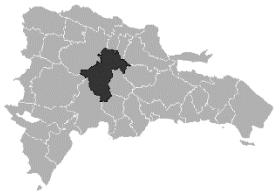
La Vega

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: La Vega

Province Capital: La Vega



Area: 2,579 km^2

La Vega is centrally located and includes the fertile La Vega Real region. La Vega is a prosperous commercial, manufacturing, and transportation center which yields cacao, coffee, tobacco, rice, fruits, and cattle.

406,990
Population
(2017)

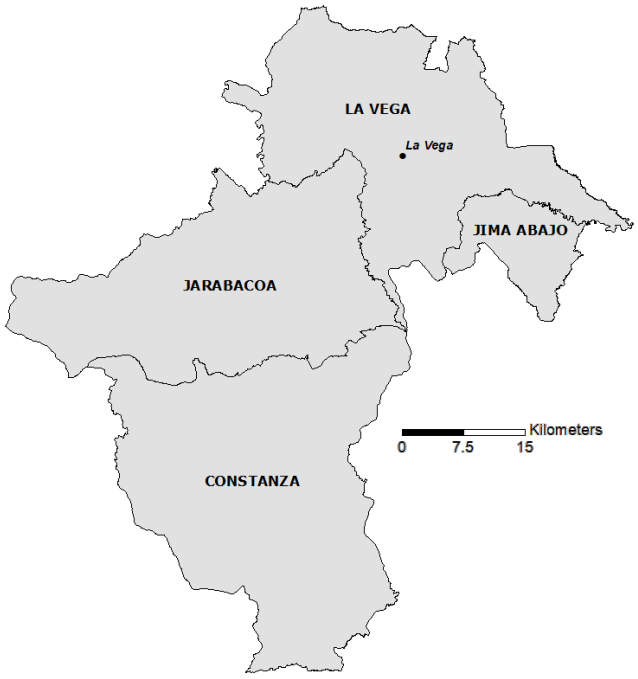
30.4%
Population in Poverty

14.7%
Illiterate Population

23.2
Infant Mortality Rate

71.9%
Access to Improved Water

Municipality	Population
La Vega	256,146
Constanza	60,954
Jarabacoa	58,646
Jima Abajo	31,244



Multi-Hazard Risk Rank: Medium (15 of 32)

Lack of Resilience Rank: Very Low (27 of 32)

RVA Component Scores

Table 82. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Medium		Very Low		Very High		Low		Very High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.525	15	0.425	27	0.725	7	0.398	21	0.547	5

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[101] Rank: 7 of 32 Provinces (Score: 0.725)

Table 83. Estimated ambient population[102] exposed to each hazard

Cyclone

100%

469,044 People

Earthquake

100%

469,044 People

Landslide

71%

332,991 People

Flood

39%

184,350 People

Tsunami

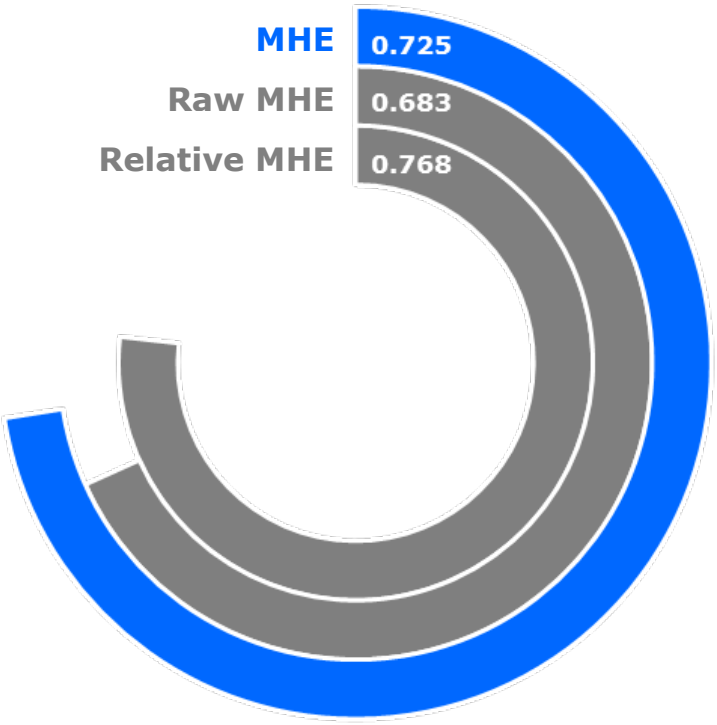
0%

0 People

Case Study: Flooding in La Vega Province

In early April 2018, the Province of La Vega experienced a significant flooding event after "heavy rain caused the Camú and Yaque del Norte rivers to overflow, flooding several areas…". With over 99mm of rain in a 24-hour period, the country's Emergency Operations Center (COE) declared a red alert for the province. More than 4,000 people were evacuated, and over 800 homes were damaged or destroyed. The national social service agency worked to return affected areas to normal within days of the disaster.

"Dominican Republic – Thousands Evacuated After Floods in La Vega Province" – Floodlist, 10 April 2018



[101] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[102] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[103] Rank: 21 of 32 Provinces (Score: 0.398)
Despite this relatively low rank, vulnerability in La Vega is strongly influenced by a high **Gender Inequality**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

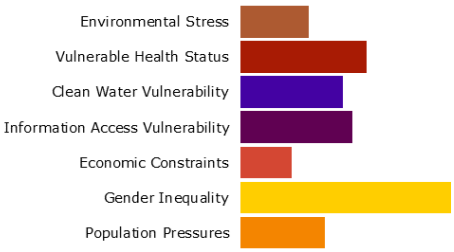


Table 84. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-1.6%** Average Annual Forest Change					
Vulnerable Health Status	**23.2** Infant Mortality Rate	**67.8** Maternal Mortality Rate	**11.5** Chronic Malnutrition	**7.6%** Population Disabled			
Clean Water Vulnerability	**28.1%** Households without Access to Improved Water	**4.8%** Households without Access to Flush Toilets					
Information Access Vulnerability	**14.7%** Illiteracy	**83.1%** Primary School Enrollment	**91.1%** Households without Internet	**20.1%** Households without TV	**47.5%** Households without Radio	**6.4** Average years of Schooling	
Economic Constraints	**54.0** Economic Dependency Ratio	**30.4%** Population in Poverty	**33.0%** CEP Beneficiaries				
Gender Inequality	**28.7%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.52** Female to Male Labor Ratio				
Population Pressures	**0.41%** Average Annual Population Change	**0.96%** Average Annual Urban Population Change					

[103] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[104] Rank: 5 of 32 Provinces (Score: 0.547) La Vega exhibits moderate relative scores in the thematic areas of **Health Care Capacity, Economic Capacity** and **Governance.** The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

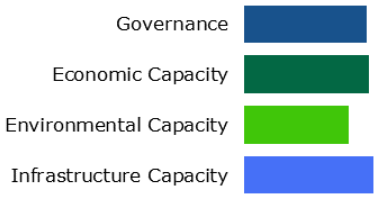


Table 85. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.05** Debt to Service Ratio	**94.2%** Employment Rate (Male)	**RD$ 24,585** Average Annual Income per Capita			
Governance	**72.7%** Registered Voter Participation (2016 Election)	**17.1** Homicide Rate per 100k persons	**71.5%** Households with Garbage Collection			
Environmental Capacity	**31.9%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.9** Hospital Beds per 10,000 Persons	**14.8** Nurses per 10,000 Persons	**14.0** Physicians per 10,000 Persons	**4.2 km** Average Distance to Nearest Hospital	**0.93** Vaccination Index[105]
Communications Capacity	**18.2%** Households with Access to Fixed Phone Line	**78.4%** Households with Access to Mobile Phone			
Transportation Capacity	**19.0 km** Average Distance to Nearest Port or Airport	**0.82 km** Total Length of Road per km^2 (area)			

[104] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[105] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[106] Rank: 27 of 32 Provinces (Score: 0.425)

La Vega's score and ranking are due to low Vulnerability combined with high Coping Capacity scores. La Vega ranks 21st in Vulnerability and 5th in Coping Capacity.

Table 86. The 3 Thematic areas with the Weakest Relative Scores

Gender Inequality	**Health Care Infrastructure Capacity**	**Economic Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[107] Rank: 15 of 32 Provinces (Score: 0.525)

La Vega's score and ranking are due to high Multi-Hazard Exposure combined with low Vulnerability and very high Coping Capacity.

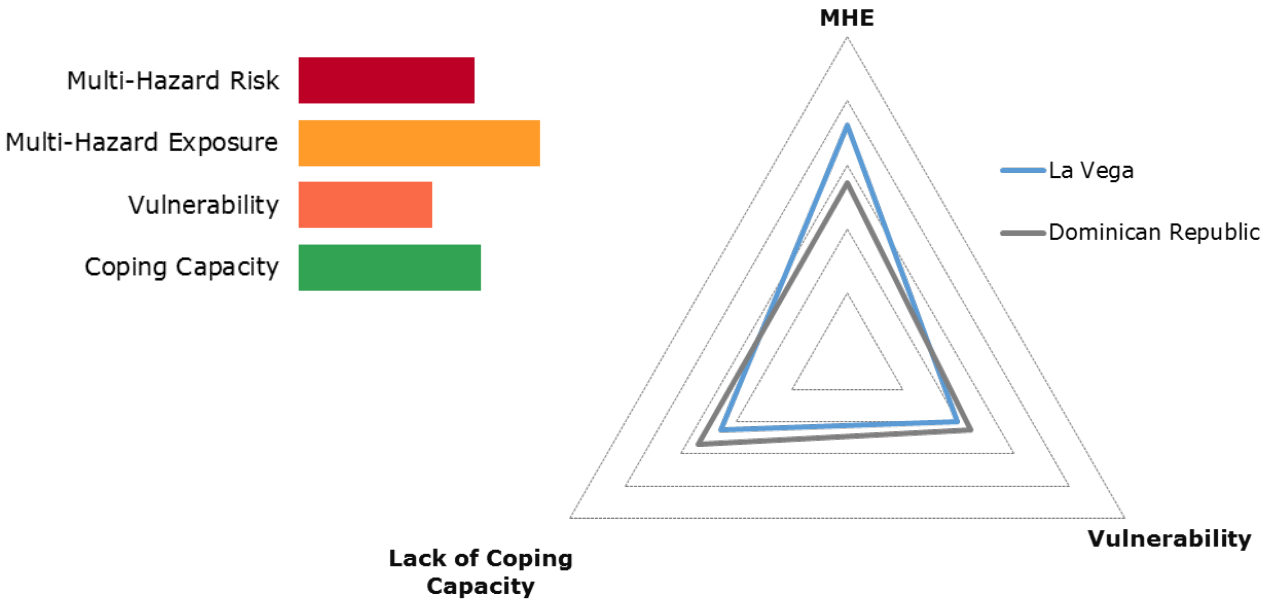


Figure 44. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[106] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[107] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low environmental stress
Ranked 25 of 32 provinces, low environmental stress indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Low population pressures
Ranked 25 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Low economic constraints
Ranked 26 of 32 provinces, low economic constraints indicate that La Vega may be able to invest in additional mitigation and preparedness measures at the local and community level.

Recommendations

01

Increase business development
Invest in business development and education programs to boost economic capacity and increase the number of businesses and the likelihood of success of those businesses.

02

Increase health care availability
Increase clinics and medical personnel through incentivized programs and investments to increase the health resilience of the population.

03

Provide increased opportunities for women
Public education and awareness programs that focus on increasing the role of women in the workplace and the society will improve resilience and decrease vulnerability.

Better solutions.
Fewer disasters.
Safer world.

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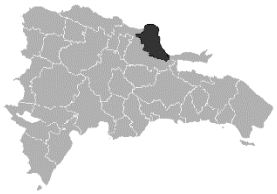
María Trinidad Sánchez

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: María Trinidad Sánchez

Province Capital: Nagua



Area: 1,364 km^2

Located in the northern region, María Trinidad Sánchez is known for its ecotourism, national parks and agricultural products including rice, coconut and cocoa.

141,284
Population
(2017)

41.6%
Population in Poverty

14.3%
Illiterate Population

16.3
Infant Mortality Rate

75.3%
Access to Improved Water

Municipality	Population
Nagua	77,192
Cabrera	24,587
El Factor	24,301
Rio San Juan	15,204

Multi-Hazard Risk Rank: Very High (7 of 32)

Lack of Resilience Rank: Medium (18 of 32)

RVA Component Scores

Table 87. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		**Medium**		**High**		**Medium**		**Low**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.555	7	0.487	18	0.691	11	0.398	20	0.423	23

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[108] Rank: 11 of 32 Provinces (Score: 0.691)

Table 88. Estimated ambient population[109] exposed to each hazard

Cyclone

100%

163,100 People

Earthquake

100%

163,100 People

Landslide

61%

99,011 People

Flood

46%

75,103 People

Tsunami

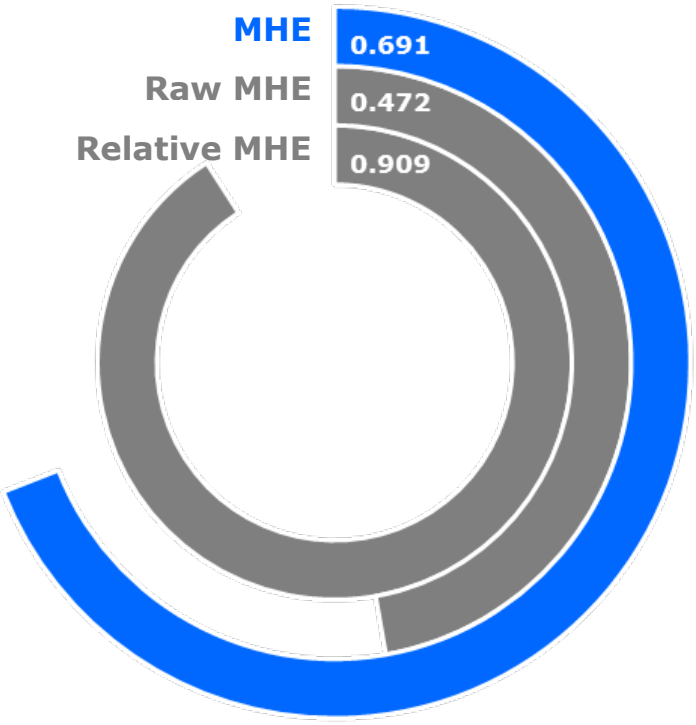
29%

46,632 People

Case Study: Oxfam Support in María Trinidad Sánchez

Following Hurricane Irma, the northern coast of the Dominican Republic was heavily affected. The province of María Trinidad Sánchez experienced significant impacts to people's livelihoods, with "nearly 5,000 acres of crops and more than 100 houses" destroyed. Oxfam, alongside other Caribbean partner organizations, supported relief efforts in the province, "calling on the government to provide humanitarian assistance to the most affected people." This was just one such example of community advocacy which helped to support the larger disaster recovery process in the country.

"Hurricane Irma: Oxfam assists those hit hardest in Haiti, Dominican Republic" – Oxfam, 12 September 2017



[108] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[109] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[110] Rank: 20 of 32 Provinces (Score: 0.398)
Vulnerability in María Trinidad Sánchez is influenced by **Gender Inequality** and **Information Access Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

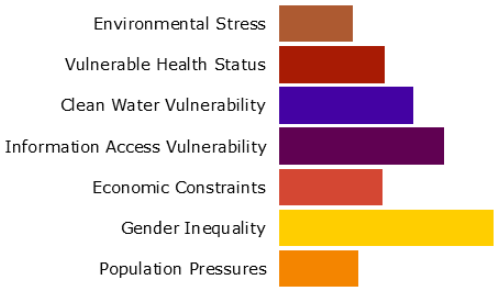


Table 89. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-1.1%** Average Annual Forest Change					
Vulnerable Health Status	**16.3** Infant Mortality Rate	**86.0** Maternal Mortality Rate	**9.1** Chronic Malnutrition	**7.6%** Population Disabled			
Clean Water Vulnerability	**24.7%** Households without Access to Improved Water	**9.1%** Households without Access to Flush Toilets					
Information Access Vulnerability	**14.3%** Illiteracy	**78.9%** Primary School Enrollment	**93.1%** Households without Internet	**25.6%** Households without TV	**54.8%** Households without Radio	**6.4** Average years of Schooling	
Economic Constraints	**54.5** Economic Dependency Ratio	**41.6%** Population in Poverty	**40.6%** CEP Beneficiaries				
Gender Inequality	**34.7%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.53** Female to Male Labor Ratio				
Population Pressures	**0.01%** Average Annual Population Change	**2.6%** Average Annual Urban Population Change					

[110] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[111] Rank: 23 of 32 Provinces (Score: 0.423) The thematic areas with the weakest relative scores are **Environmental Capacity, Health Care Capacity** and **Governance.** The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

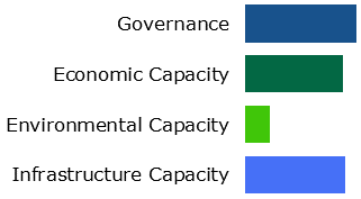


Table 90. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.06** Debt to Service Ratio	**92.6%** Employment Rate (Male)	**RD$ 23,874** Average Annual Income per Capita			
Governance	**76.2%** Registered Voter Participation (2016 Election)	**17.7** Homicide Rate per 100k persons	**56.8%** Households with Garbage Collection			
Environmental Capacity	**7.7%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**9.9** Hospital Beds per 10,000 Persons	**19.2** Nurses per 10,000 Persons	**13.9** Physicians per 10,000 Persons	**3.5 km** Average Distance to Nearest Hospital	**0.17** Vaccination Index[112]
Communications Capacity	**10.9%** Households with Access to Fixed Phone Line	**76.9%** Households with Access to Mobile Phone			
Transportation Capacity	**33.4 km** Average Distance to Nearest Port or Airport	**0.70 km** Total Length of Road per km^2 (area)			

[111] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[112] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[113] Rank: 18 of 32 Provinces (Score: 0.487)

María Trinidad Sánchez's score and ranking are due to low Vulnerability combined with low Coping Capacity scores. María Trinidad Sánchez ranks 20th in Vulnerability and 23rd in Coping Capacity.

Table 91. The 3 Thematic areas with the Weakest Relative Scores

Health Care Infrastructure Capacity	**Gender Inequality**	**Environmental Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[114] Rank: 7 of 32 Provinces (Score: 0.555)

María Trinidad Sánchez's score and ranking are due to high Multi-Hazard Exposure combined with low Vulnerability and Coping Capacity.

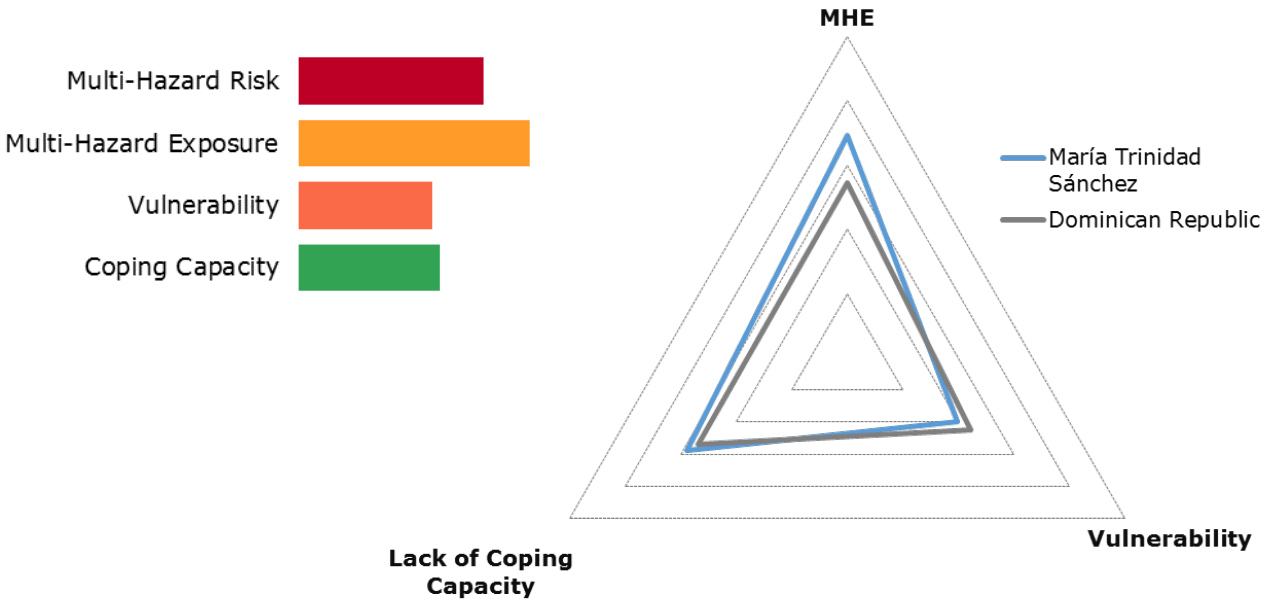


Figure 45. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[113] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[114] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Lowest environmental stress
Ranked 26 of 32 provinces, low environmental stress indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Low vulnerable health status
Ranked 25 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Low population pressures
Ranked 28 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Recommendations

01

Increase health care availability
Increase clinics and medical personnel through incentivized programs and investments to increase the health resilience of the population.

02

Increase environmental programs
Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

03

Provide opportunities for women
Public education and awareness programs that focus on increasing the role of women in the workplace and the society will improve the resilience of women during disasters.

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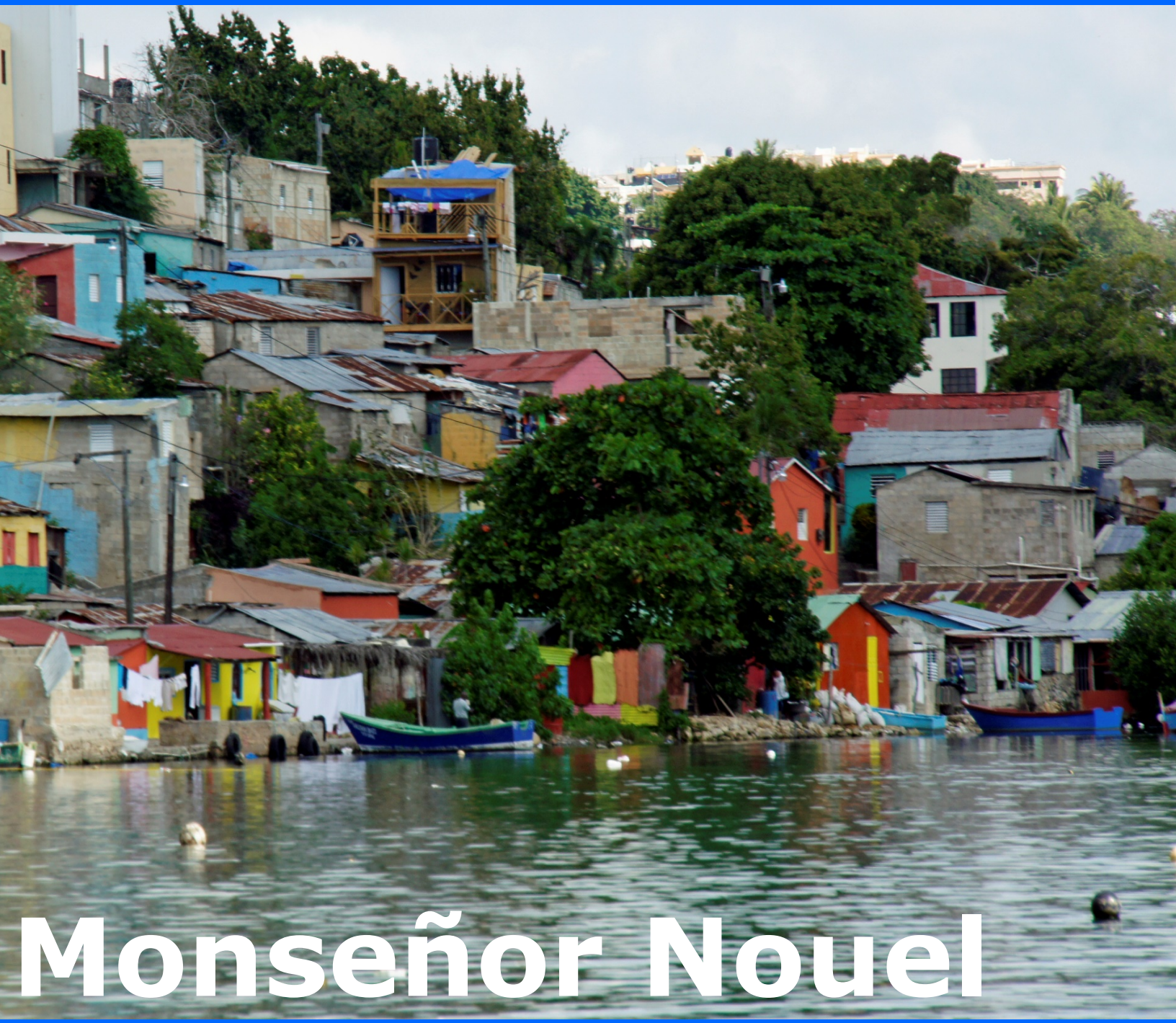


Monseñor Nouel

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Monseñor Nouel

Province Capital: Bonao

Area: 1,114 km^2

Located in the center of the country, Monseñor Nouel is a mountainous region known for its mining and agricultural sectors.

171,865
Population
(2017)

26.1%
Population in Poverty

12.7%
Illiterate Population

18.0
Infant Mortality Rate

90.7%
Access to Improved Water

Municipality	Population
Bonao	130,381
Maimón	19,711
Piedra Blanca	21,773

Multi-Hazard Risk Rank: Low (21 of 32)

Lack of Resilience Rank: Very Low (28 of 32)

RVA Component Scores

Table 92. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		Very Low		High		Very Low		High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.504	21	0.406	28	0.701	9	0.320	29	0.508	10

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[115] Rank: 9 of 32 Provinces (Score: 0.701)

Table 93. Estimated ambient population[116] exposed to each hazard

Cyclone

100%

202,908 People

Earthquake

100%

202,908 People

Landslide

60%

121,035 People

Flood

71%

144,874 People

Tsunami

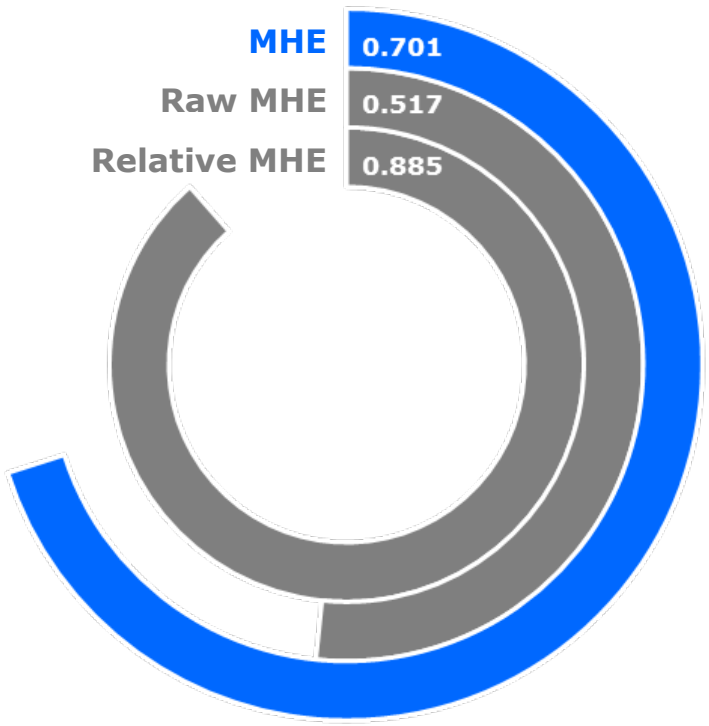
0%

0 People

Case Study: *Emergency Recovery and Disaster Management* Project – Monseñor Nouel

In March of 2016, the World Bank collaborated with the Dominican Republic's National Institute of Hydraulic Resources (INDRHI) for a joint project focused on the rehabilitation of canals, roads, and irrigation infrastructure in the province. This maintenance project was developed in response to the infrastructure damage caused by Storms Noel and Olga and was intended to manage risks posed by natural disasters within Monseñor Nouel.

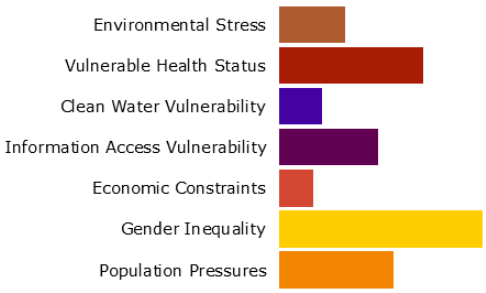
"Dominican Republic - Emergency Recovery and Disaster Management Project: Plan de Reasentamiento Abreviado del Municipio, Bonao, Provincia Monseñor Nouel" – World Bank, 11 March 2016



[115] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[116] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)



Vulnerability[117] Rank: 29 of 32 Provinces (Score: 0.320)
Vulnerability in Monseñor Nouel is influenced by moderate subcomponent score in the thematic areas of **Gender Inequality** and **Vulnerable Health Status**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

Table 94. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-0.3%** Average Annual Forest Change					
Vulnerable Health Status	**18.0** Infant Mortality Rate	**96.2** Maternal Mortality Rate	**12.7** Chronic Malnutrition	**7.8%** Population Disabled			
Clean Water Vulnerability	**9.3%** Households without Access to Improved Water	**3.9%** Households without Access to Flush Toilets					
Information Access Vulnerability	**12.7%** Illiteracy	**90.2%** Primary School Enrollment	**88.6%** Households without Internet	**19.9%** Households without TV	**49.9%** Households without Radio	**6.8** Average years of Schooling	
Economic Constraints	**54.8** Economic Dependency Ratio	**26.1%** Population in Poverty	**25.7%** CEP Beneficiaries				
Gender Inequality	**32.3%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.49** Female to Male Labor Ratio				
Population Pressures	**0.52%** Average Annual Population Change	**1.3%** Average Annual Urban Population Change					

[117] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[118] Rank: 10 of 32 Provinces (Score: 0.508) The thematic areas with the weakest relative scores are **Environmental Capacity, Economic Capacity,** and **Infrastructure (Health Care Capacity and Transportation)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

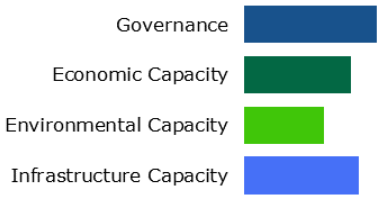


Table 95. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.93** Debt to Service Ratio	**91.2%** Employment Rate (Male)	**RD$ 26,666** Average Annual Income per Capita			
Governance	**72.1%** Registered Voter Participation (2016 Election)	**17.7** Homicide Rate per 100k persons	**82.4%** Households with Garbage Collection			
Environmental Capacity	**24.4%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.5** Hospital Beds per 10,000 Persons	**11.2** Nurses per 10,000 Persons	**13.5** Physicians per 10,000 Persons	**3.1 km** Average Distance to Nearest Hospital	**0.78** Vaccination Index[119]	
Communications Capacity	**21.2%** Households with Access to Fixed Phone Line	**78.4%** Households with Access to Mobile Phone				
Transportation Capacity	**35.9 km** Average Distance to Nearest Port or Airport	**0.46 km** Total Length of Road per km^2 (area)				

[118] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[119] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[120] Rank: 28 of 32 Provinces (Score: 0.406)

Monseñor Nouel's score and ranking are due to very low Vulnerability combined with high Coping Capacity scores. Monseñor Nouel ranks 29th in Vulnerability and 10th in Coping Capacity.

Table 96. The 3 Thematic areas with the Weakest Relative Scores

Gender Inequality	**Transportation Infrastructure Capacity**	**Health Care Infrastructure Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[121] Rank: 21 of 32 Provinces (Score: 0.504)

Monseñor Nouel's score and ranking are due to high Multi-Hazard Exposure combined with very low Vulnerability and high Coping Capacity.

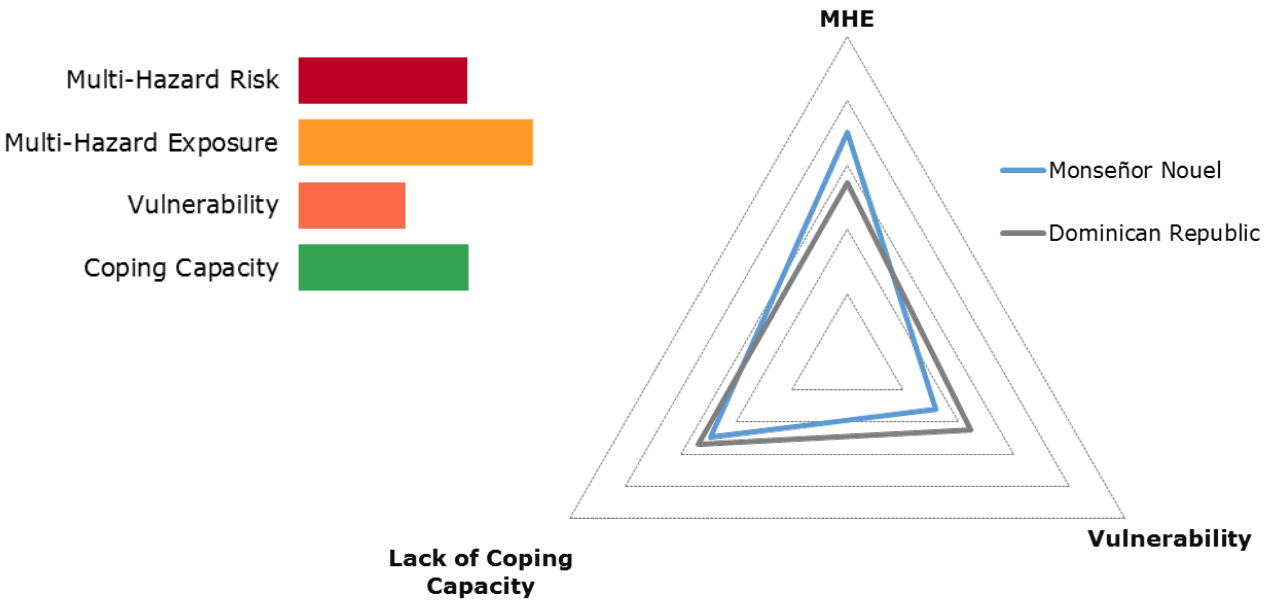


Figure 46. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[120] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[121] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low economic constraints
Ranked 29 of 32 provinces, low economic constraints indicate that Monseñor Nouel may be able to invest in additional mitigation and preparedness measures at the local and community level.

Lowest poverty rate
Ranked 32 of 32 provinces (26.1% Poverty Rate), low poverty rates indicate an increased ability to invest in mitigation and preparedness measures at the individual, household, and provincial level.

High information access
High information access indicates that the population has an increased ability to access and comprehend disaster-related information before, during, and after events.

Recommendations

01

Invest in Infrastructure
Invest in Health Care, Transportation and Communication Infrastructures to increase coping capacity and resiliency within the province.

02

Provide opportunities for women
Public education and awareness programs that focus on increasing the role of women in the workplace and the society will improve the resilience of women during disasters.

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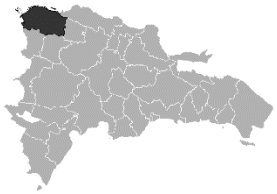
Monte Cristi

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Monte Cristi

Province Capital: San Fernando de Monte Cristi



Area: 2,137 km^2

Monte Cristi is located in the northwest of the country in the coastal lowlands near the border with Haiti. Monte Cristi is an important commercial and transportation center, trading mainly in rice, cotton, coffee, bananas, goats, hides and skins from the western portion of the fertile Cibao Valley.

115,278
Population
(2017)

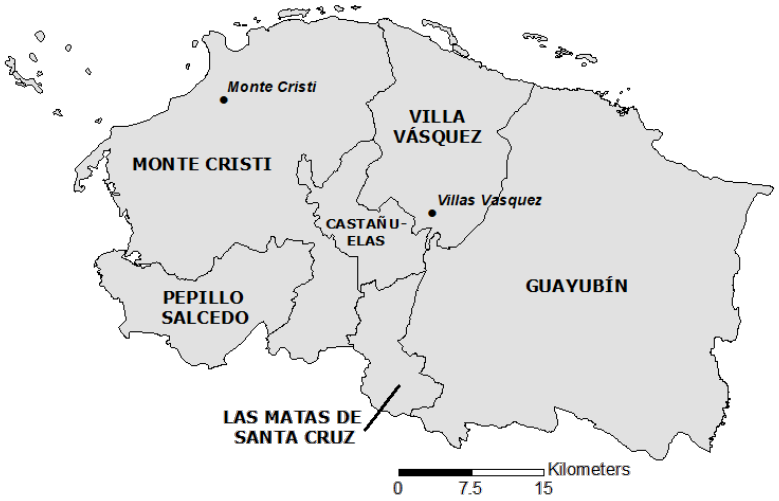
59.7%
Population in Poverty

22.4%
Illiterate Population

23.0
Infant Mortality Rate

89.4%
Access to Improved Water

Municipality	Population
Monte Cristi	25,918
Castañuelas	15,693
Guayabin	37,777
Las Matas De Santa Cruz	11,107
Pepillo Salcedo	9,611
Villa Vázquez	15,172



Multi-Hazard Risk Rank: Very High (6 of 32)

Lack of Resilience Rank: High (8 of 32)

RVA Component Scores

Table 97. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		High		Medium		Very High		High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.558	6	0.545	8	0.584	15	0.565	7	0.475	14

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[122] Rank: 15 of 32 Provinces (Score: 0.584)

Table 98. Estimated ambient population[123] exposed to each hazard

Cyclone

100%

135,611 People

Earthquake

100%

135,611 People

Landslide

46%

62,132 People

Flood

58%

78,551 People

Tsunami

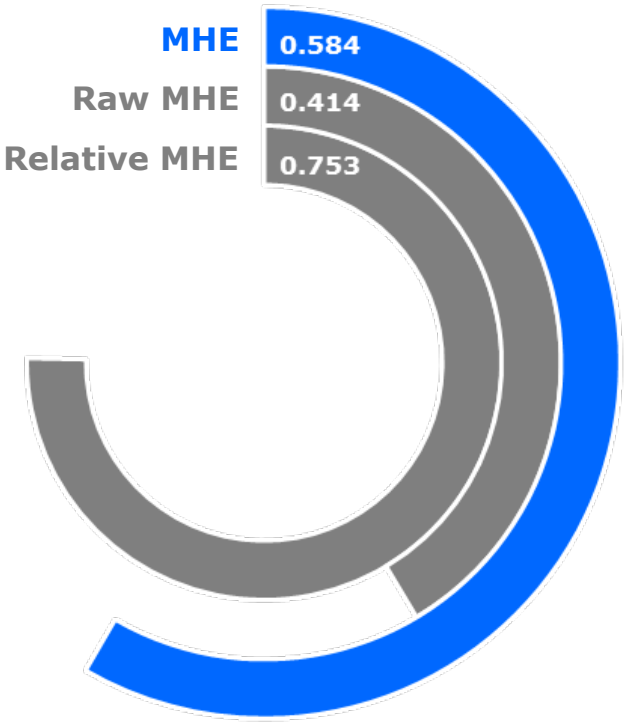
4%

5,357 People

Case Study: Improving Emergency Medical Services in the Dominican Republic

Trek Medics, a nonprofit medical organization, has been working in the provinces of Monte Cristi and Puerto Plata in the Dominican Republic since 2014. Through partnerships with public safety and health agencies, as well as the Dominican Red Cross, Trek Medics has sought to improve emergency medical services in rural and urban communities. Trek Medic's projects have included the development of "a 24-7 emergency response network" across the provinces, as well as "prehospital emergency care and inter-facility transfers… to promote reliable emergency care and transport."

DR Program - Trek Medics, 2019 https://www.trekmedics.org/programs/dr/



[122] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[123] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[124] Rank: 7 of 32 Provinces (Score: 0.565) Vulnerability in Monte Cristi is strongly influenced by **Vulnerable Health Status, Gender Inequality,** and **Information Access Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

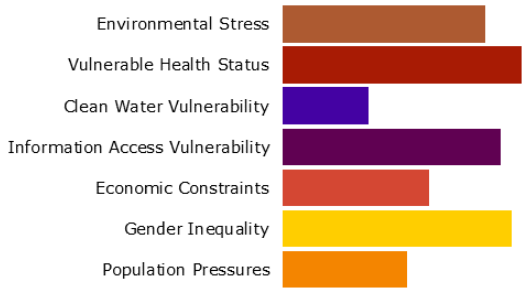


Table 99. Component Scores for each Vulnerability Sub-component

Environmental Stress	**100%** Province Susceptible to Drought	**1.6%** Average Annual Forest Change					
Vulnerable Health Status	**23.0** Infant Mortality Rate	**250.7** Maternal Mortality Rate	**11.9** Chronic Malnutrition	**10.5%** Population Disabled			
Clean Water Vulnerability	**10.6%** Households without Access to Improved Water	**9.7%** Households without Access to Flush Toilets					
Information Access Vulnerability	**22.4%** Illiteracy	**77.4%** Primary School Enrollment	**95.6%** Households without Internet	**37.3%** Households without TV	**58.3%** Households without Radio	**5.8** Average years of Schooling	
Economic Constraints	**58.4** Economic Dependency Ratio	**59.7%** Population in Poverty	**38.9%** CEP Beneficiaries				
Gender Inequality	**38.0%** Female Seats in Government	**1.2** Female to Male Years of Schooling	**0.55** Female to Male Labor Ratio				
Population Pressures	**0.69%** Average Annual Population Change	**1.3%** Average Annual Urban Population Change					

[124] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[125] Rank: 14 of 32 Provinces (Score: 0.475) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Infrastructure (Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

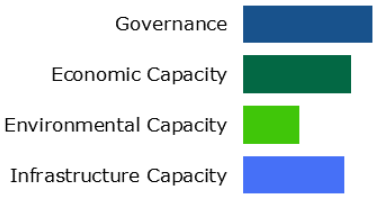


Table 100. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.97** Debt to Service Ratio	**93.5%** Employment Rate (Male)	**RD$ 18,980** Average Annual Income per Capita			
Governance	**78.7%** Registered Voter Participation (2016 Election)	**14.1** Homicide Rate per 100k persons	**51.5%** Households with Garbage Collection			
Environmental Capacity	**17.3%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**14.8** Hospital Beds per 10,000 Persons	**18.5** Nurses per 10,000 Persons	**15.4** Physicians per 10,000 Persons	**4.2 km** Average Distance to Nearest Hospital	**0.88** Vaccination Index[126]	
Communications Capacity	**11.3%** Households with Access to Fixed Phone Line	**68.7%** Households with Access to Mobile Phone				
Transportation Capacity	**33.6 km** Average Distance to Nearest Port or Airport	**0.61 km** Total Length of Road per km^2 (area)				

[125] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[126] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[127] Rank: 8 of 32 Provinces (Score: 0.545)

Monte Cristi's score and ranking are due to high Vulnerability combined with moderate Coping Capacity scores. Monte Cristi ranks 7th in Vulnerability and 14th in Coping Capacity.

Table 101. The 3 Thematic areas with the Weakest Relative Scores

Vulnerable Health Status

Gender Inequality

Information Access Vulnerability

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[128] Rank: 6 of 32 Provinces (Score: 0.558)

Monte Cristi's score and ranking are due to moderate Multi-Hazard Exposure combined with high Vulnerability and moderate Coping Capacity.

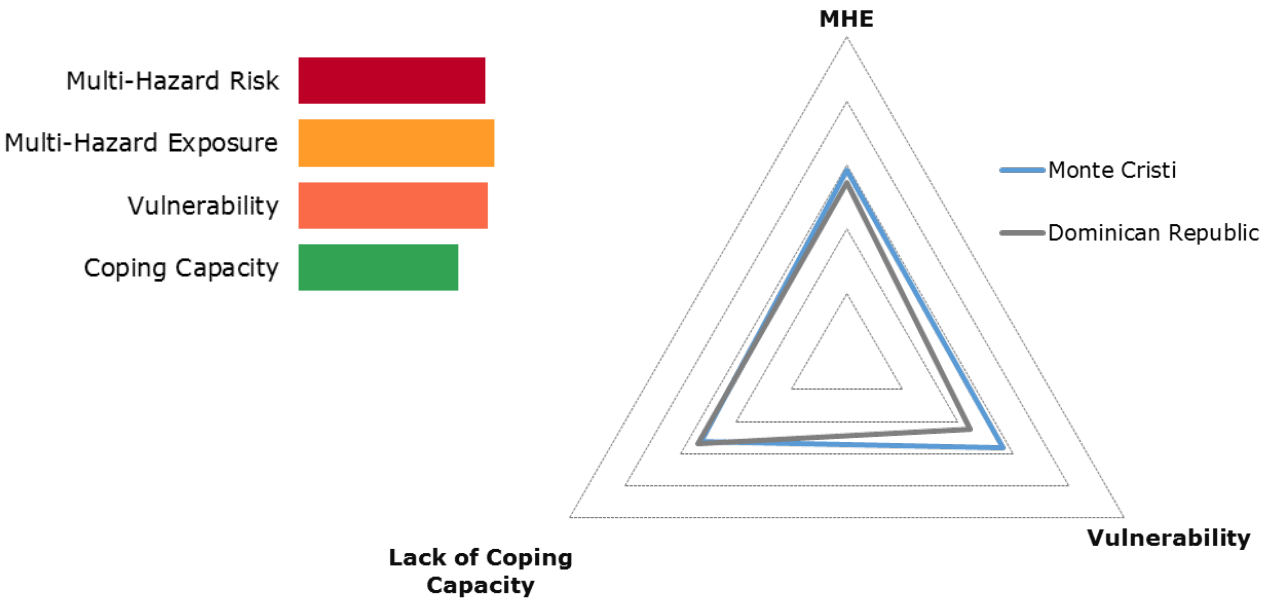


Figure 47. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[127] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[128] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low clean water vulnerability

Ranked 21 of 32 provinces, low clean water vulnerability indicates that a population has access to high water quality and good containment systems, reducing susceptibility to disaster.

High overall governance

Ranked 11 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Recommendations

01

Invest in access to health care

Through education, facility construction, and traveling care programs, increase the citizens' ability to access health-related information and physical care, especially for new/expectant mothers and young children.

02

Invest in communication infrastructure

Invest in communication infrastructure to allow for easier access to information and education material, increasing literacy and situational awareness of the population.

03

Provide opportunities for women

Public education and awareness programs, as well as increased business and political opportunities that focus on advancing the role of women in the workplace and the society, will improve resilience and decrease vulnerability.

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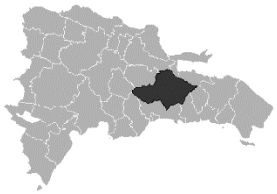
Monte Plata

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Monte Plata

Province Capital: Monte Plata



Area: 2,921 km^2

Located in the eastern region of the country, Monte Plata is known for agriculture and possesses a wealth of folkloric elements and rich culture.

189,649
Population
(2017)

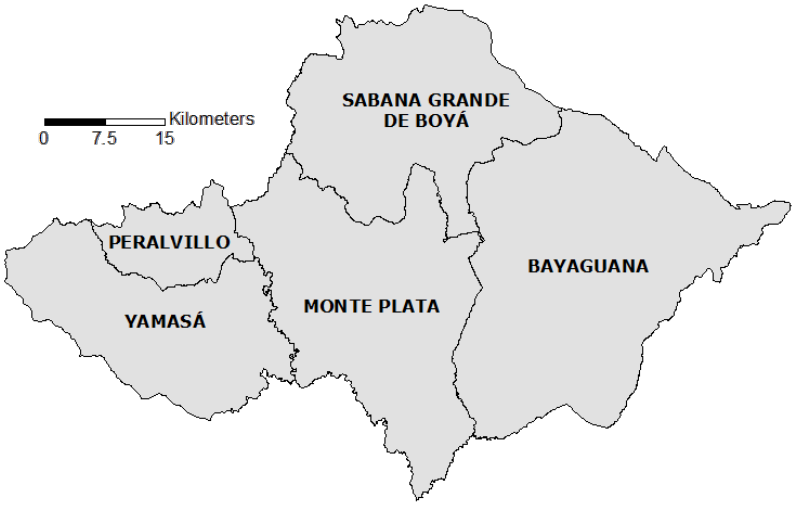
69.7%
Population in Poverty

17.6%
Illiterate Population

15.8
Infant Mortality Rate

61.7%
Access to Improved Water

Municipality	Population
Monte Plata	47,652
Bayaguana	32,521
Sabana Grande De Boya	31,713
Yamasá	56,447
Peralvillo	21,316



Multi-Hazard Risk Rank: Very High (3 of 32)

Lack of Resilience Rank: Very High (7 of 32)

RVA Component Scores

Table 102. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very High		Very High		Medium		High		Very Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.567	3	0.566	7	0.569	16	0.497	10	0.365	29

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[129] Rank: 16 of 32 Provinces (Score: 0.569)

Table 103. Estimated ambient population[130] exposed to each hazard

Cyclone

100%

216,438 People

Earthquake

100%

216,438 People

Landslide

61%

131,619 People

Flood

27%

57,582 People

Tsunami

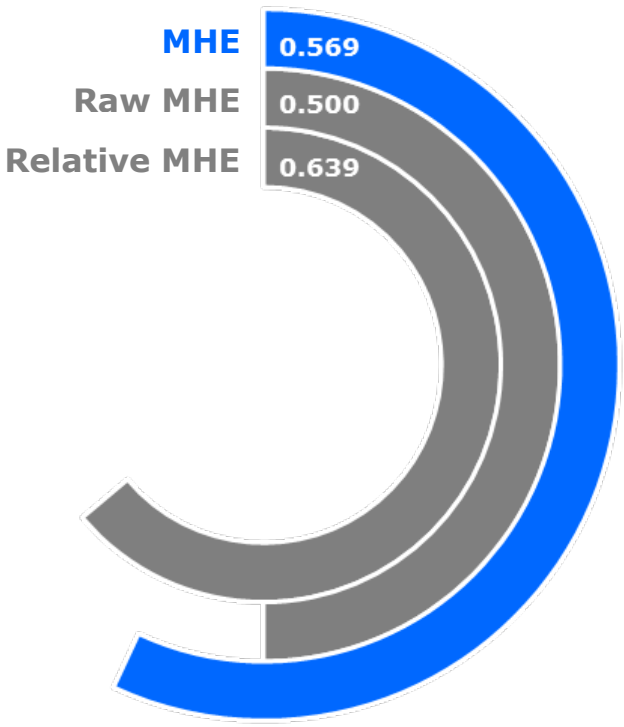
0%

0 People

Case Study: Ozama River Flooding in Monte Plata

In April 2017, the province of Monte Plata experienced significant flooding, with more than 500 homes destroyed by overflow from the Ozama River. The flooding caused the evacuation of nearly 3,000 people from their homes, as well as significant impacts to local infrastructure. Dozens of communities became inaccessible as roads and bridges were washed away. In response to the floods, the Dominican Republic activated its Emergency Operations Center (COE) to issue warnings for landslides and additional flooding, providing a valuable service to the affected population.

"Flood in Dominican Republic" – International Space Charter Activation, 24 April 2017, https://disasterscharter.org/web/guest/activations/-/article/flood-in-dominican-republic-call-605-



[129] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[130] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[131] Rank: 10 of 32 Provinces (Score: 0.497) Vulnerability in Monte Plata is influenced by **Clean Water Vulnerability, Economic Constraints,** and **Information Access Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

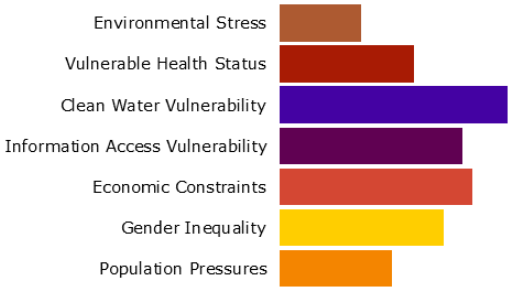


Table 104. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-1.8%** Average Annual Forest Change					
Vulnerable Health Status	**15.8** Infant Mortality Rate	**132.0** Maternal Mortality Rate	**8.6** Chronic Malnutrition	**9.3%** Population Disabled			
Clean Water Vulnerability	**38.3%** Households without Access to Improved Water	**15.8%** Households without Access to Flush Toilets					
Information Access Vulnerability	**17.6** Illiteracy	**88.4%** Primary School Enrollment	**96.9%** Households without Internet	**31.7%** Households without TV	**59.2%** Households without Radio	**5.7** Average years of Schooling	
Economic Constraints	**64.6** Economic Dependency Ratio	**69.7%** Population in Poverty	**40.1%** CEP Beneficiaries				
Gender Inequality	**39.2%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.49** Female to Male Labor Ratio				
Population Pressures	**0.23%** Average Annual Population Change	**2.4%** Average Annual Urban Population Change					

[131] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[132] Rank: 29 of 32 Provinces (Score: 0.365) Monte Plata's weakest relative scores are **Environmental Capacity, Communications Infrastructure,** and **Health Care Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

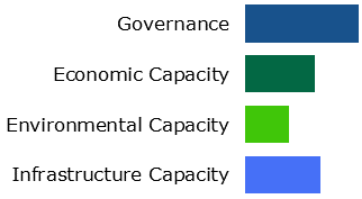


Table 105. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.97** Debt to Service Ratio	**91.6%** Employment Rate (Male)	**RD$ 15,957** Average Annual Income per Capita			
Governance	**79.7%** Registered Voter Participation (2016 Election)	**15.4** Homicide Rate per 100k persons	**42.1%** Households with Garbage Collection			
Environmental Capacity	**13.4%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**12.7** Hospital Beds per 10,000 Persons	**11.6** Nurses per 10,000 Persons	**14.1** Physicians per 10,000 Persons	**4.0 km** Average Distance to Nearest Hospital	**0.14** Vaccination Index[133]
Communications Capacity	**4.9%** Households with Access to Fixed Phone Line	**67.0%** Households with Access to Mobile Phone			
Transportation Capacity	**30.0 km** Average Distance to Nearest Port or Airport	**0.51 km** Total Length of Road per km^2 (area)			

[132] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[133] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[134] Rank: 7 of 32 Provinces (Score: 0.566)

Monte Plata's score and ranking are due to high Vulnerability combined with very low Coping Capacity scores. Monte Plata ranks 10th in Vulnerability and 29th in Coping Capacity.

Table 106. The 3 Thematic areas with the Weakest Relative Scores

Communications Infrastructure Capacity	**Health Care Infrastructure Capacity**	**Clean Water Vulnerability**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[135] Rank: 3 of 32 Provinces (Score: 0.567)

Monte Plata's score and ranking are due to moderate Multi-Hazard Exposure combined with high Vulnerability and very low Coping Capacity.

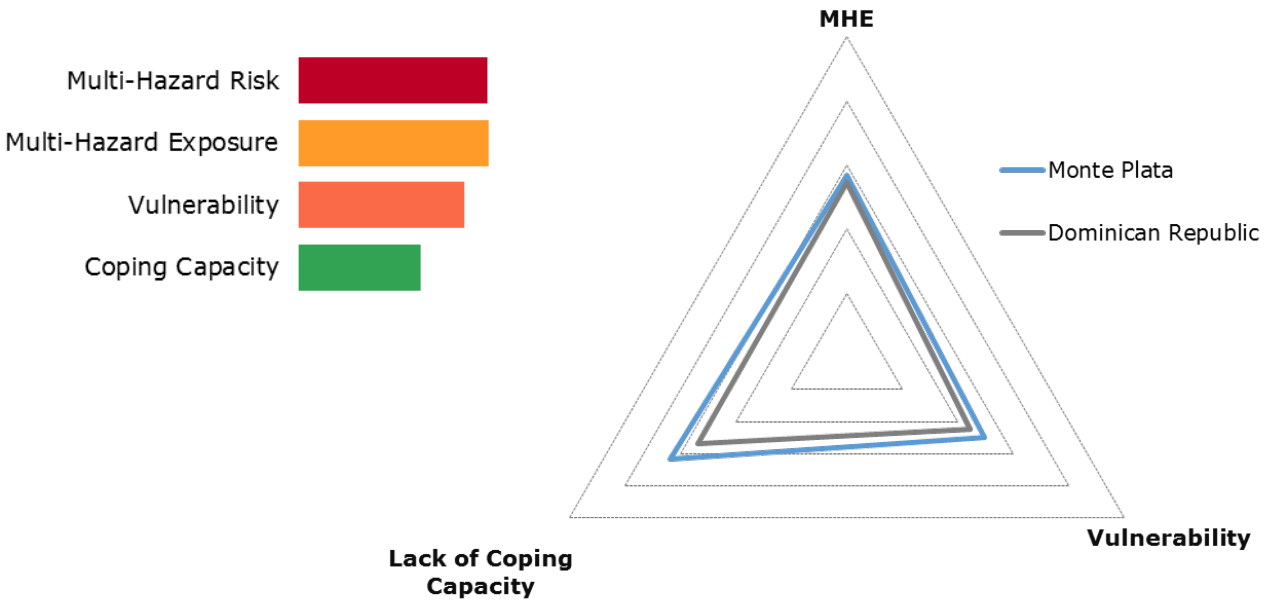


Figure 48. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[134] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[135] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low population pressures
Ranked 22 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Low environmental stress
Ranked 24 of 32 provinces, low environmental stress indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Recommendations

01

Increase water and sanitation services
Invest in public water and waste facilities to increase water quality and access and reduce the spread of disease.

02

Invest in infrastructure
Invest in Health Care, Transportation and Communication Infrastructures to increase coping capacity and resiliency within the province.

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Pedernales

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Pedernales

Province Capital: Pedernales

Area: 2,309 km^2

The most southwestern province, Pedernales serves as a commercial center for the surrounding agricultural region, which yields sugarcane, coffee and corn. Bauxite is also mined in Pedernales.

34,070
Population
(2017)

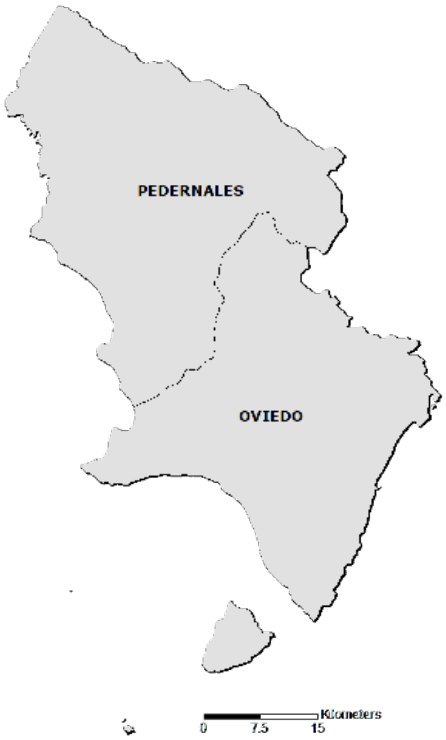
77.9%
Population in Poverty

37.7%
Illiterate Population

6.3
Infant Mortality Rate

78.3%
Access to Improved Water

Municipality	Population
Pedernales	26,202
Oviedo	7,868



Multi-Hazard Risk Rank: Very Low (29 of 32)

Lack of Resilience Rank: Very High (5 of 32)

RVA Component Scores

Table 107. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very Low		Very High		Very Low		Very High		Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.440	29	0.606	5	0.109	31	0.631	3	0.419	25

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[136] Rank: 31 of 32 Provinces (Score: 0.109)

Table 108. Estimated ambient population[137] exposed to each hazard

Cyclone

100%

28,544 People

Earthquake

0%

0 People

Landslide

52%

14,979 People

Flood

57%

16,192 People

Tsunami

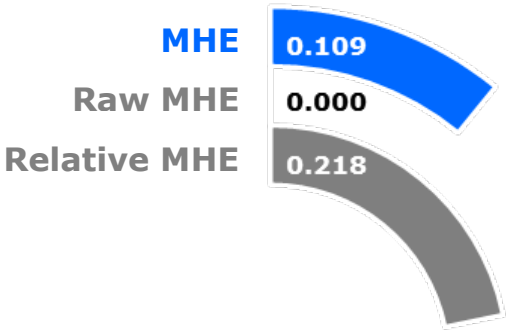
4%

1,029 People

Case Study: EU Disaster Preparedness Projects in Pedernales

During 2015-2016, the European Union's DIPECHO program invested $2.7 million "in the provinces of Dajabon, San Cristobal and Pedernales […] to reduce the impact of natural hazards by preparing vulnerable populations and the strengthening of state institutions in disaster risk management issues." The DIPECHO projects were implemented at both the national and subnational levels in areas prone to disaster impacts, and were developed in collaboration with local communities. Projects included "risk maps, emergency and contingency plans, early warning systems, and community educational campaigns."

"*Dominican Republic prepares for disaster: Launches new projects funded by the EU" – UNDRR AM, 25 May 2015*



[136] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[137] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[138] Rank: 3 of 32 Provinces (Score: 0.631) Vulnerability in Pedernales is strongly influenced by **Information Access Vulnerability, Economic Constraints,** and **Clean Water Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

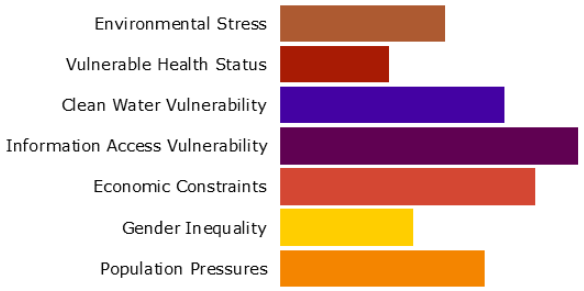


Table 109. Component Scores for each Vulnerability Sub-component

Environmental Stress	**68.6%** Province Susceptible to Drought	**0.55%** Average Annual Forest Change					
Vulnerable Health Status	**6.3** Infant Mortality Rate	**NO DATA** Maternal Mortality Rate	**16.7** Chronic Malnutrition	**5.7%** Population Disabled			
Clean Water Vulnerability	**21.7%** Households without Access to Improved Water	**24.8%** Households without Access to Flush Toilets					
Information Access Vulnerability	**37.7%** Illiteracy	**60.8%** Primary School Enrollment	**96.9%** Households without Internet	**51.6%** Households without TV	**67.9%** Households without Radio	**4.4** Average years of Schooling	
Economic Constraints	**66.1** Economic Dependency Ratio	**77.9%** Population in Poverty	**54.7%** CEP Beneficiaries				
Gender Inequality	**32.4%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.39** Female to Male Labor Ratio				
Population Pressures	**1.07%** Average Annual Population Change	**5.1%** Average Annual Urban Population Change					

[138] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[139] Rank: 25 of 32 Provinces (Score: 0.419) The thematic areas with the weakest relative scores are **Infrastructure (Communications and Transportation) and Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

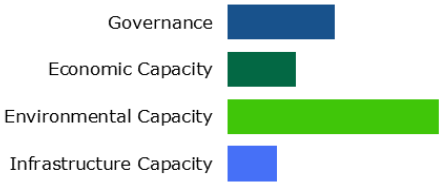


Table 110. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.02** Debt to Service Ratio	**93.1%** Employment Rate (Male)	**RD$ 12,512** Average Annual Income per Capita			
Governance	**79.0%** Registered Voter Participation (2016 Election)	**18.1** Homicide Rate per 100k persons	**52.9%** Households with Garbage Collection			
Environmental Capacity	**68.7%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**7.3** Hospital Beds per 10,000 Persons	**11.5** Nurses per 10,000 Persons	**12.1** Physicians per 10,000 Persons	**10.2 km** Average Distance to Nearest Hospital	**0.96** Vaccination Index[140]	
Communications Capacity	**3.7%** Households with Access to Fixed Phone Line	**53.7%** Households with Access to Mobile Phone				

[139] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[140] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Transportation Capacity

19.0 km Average Distance to Nearest Port or Airport

0.17 km Total Length of Road per km^2 (area)

Lack of Resilience (LR)

Lack of Resilience[141] Rank: 5 of 32 Provinces (Score: 0.606)

Pedernales's score and ranking are due to very high Vulnerability combined with low Coping Capacity scores. Pedernales ranks 3rd in Vulnerability and 25th in Coping Capacity.

Table 111. The 3 Thematic areas with the Weakest Relative Scores

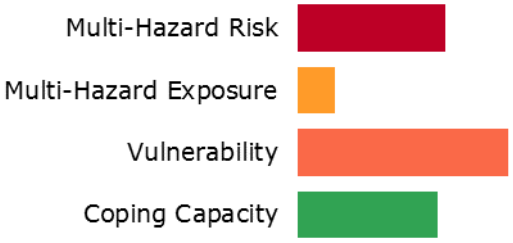
Communications Infrastructure Capacity

Information Access Vulnerability

Economic Constraints

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[142] Rank: 29 of 32 Provinces (Score: 0.440)



Pedernales' score and ranking are due to very low Multi-Hazard Exposure combined with very high Vulnerability and low Coping Capacity.

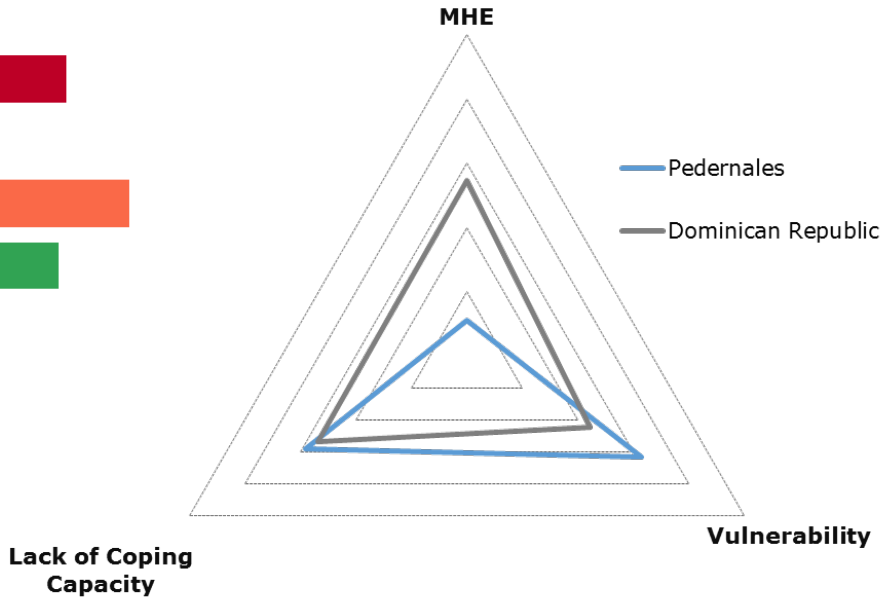


Figure 49. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[141] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[142] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low gender inequality

Ranked 27 of 32 provinces, low gender inequality indicates that vulnerable populations are more likely to have their needs met under 'normal' conditions and may be less susceptible during times of disaster.

Low vulnerable health status

Ranked 23 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Highest environmental capacity

Ranked 1 of 32 provinces, high environmental capacity indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Recommendations

01

Invest in communication infrastructure

Invest in communication infrastructure to allow for easier access to information and education material, increasing literacy and situational awareness of the population.

02

Increase economic capacity

Encourage business development and education programs to increase economic opportunities in the region.

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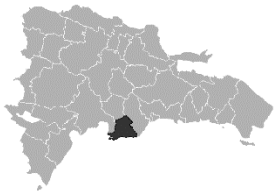
Peravia

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Peravia

Province Capital: Baní



Area: 875 km^2

Peravia is located in the south of the Dominican Republic, forming part of the Valdesia Region. Agriculture in the province is very diverse, with the main products being bananas, coffee, tomatoes, onions, rice and mango.

193,869
Population
(2017)

47.3%
Population in Poverty

14.7%
Illiterate Population

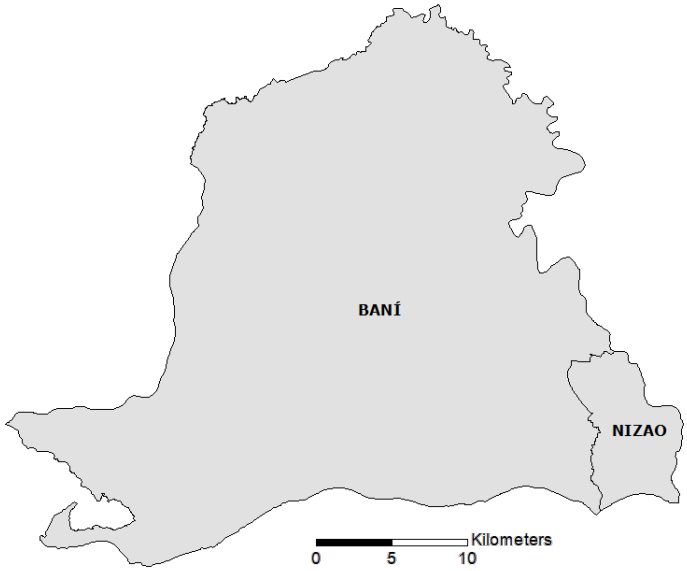
18.1
Infant Mortality Rate

82.3%
Access to Improved Water

Municipality	Population
Bani	165,446
Nizao	28,423

Multi-Hazard Risk Rank: Low (23 of 32)

Lack of Resilience Rank: High (14 of 32)



RVA Component Scores

Table 112. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		High		Low		High		Medium	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.490	23	0.506	14	0.459	21	0.473	14	0.462	18

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[143] Rank: 21 of 32 Provinces (Score: 0.459)

Table 113. Estimated ambient population[144] exposed to each hazard

Cyclone

100%

205,995 People

Earthquake

0%

0 People

Landslide

72%

148,601 People

Flood

76%

156,475 People

Tsunami

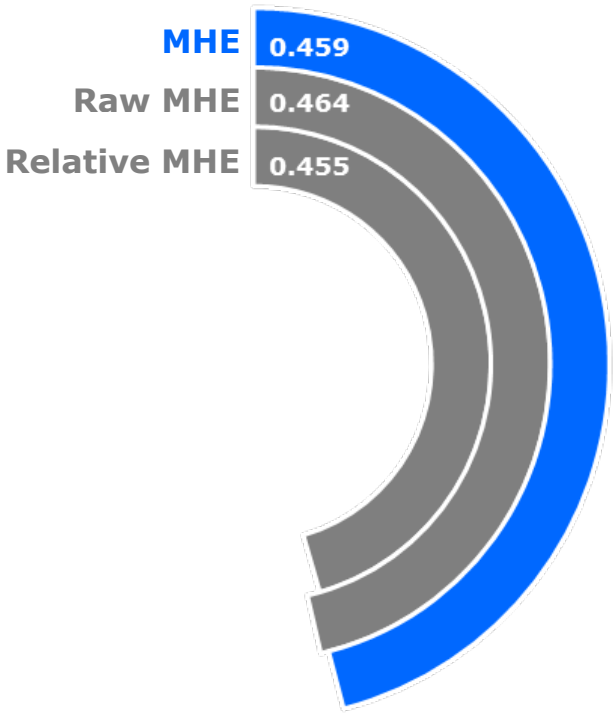
7%

13,966 People

Case Study: Potable Water in Peravia

In January 2017, the Peravia Multiple Aqueduct Project was completed by ACCIONA Aqua in the province of Peravia. With the opening of the aqueduct, more than 138,000 people were able to be supplied with potable water in the southern Dominican Republic. This infrastructure development was a significant accomplishment for an area that struggled with access to quality water resources for more than four decades. The project is operating at full capacity and includes a Potable Water Treatment Station, with the potential to reach over 300,000 people in the near future.

"ACCIONA improves potable water supplies in the Dominican Republic with the opening of the Peravia aqueduct" - ACCIONA Agua, 03 January 2017



[143] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[144] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[145] Rank: 14 of 32 Provinces (Score: 0.473) Vulnerability in Peravia is influenced by **Gender Inequality, Population Pressures,** and **Environmental Stress**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

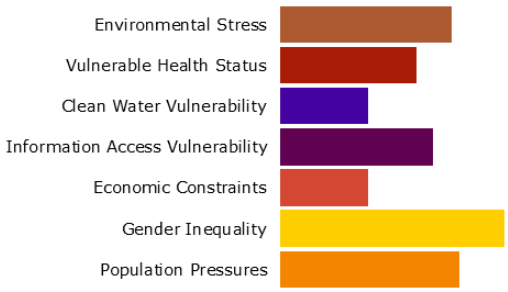


Table 114. Component Scores for each Vulnerability Sub-component

Environmental Stress	**96.6%** Province Susceptible to Drought	**4.0%** Average Annual Forest Change				
Vulnerable Health Status	**18.1** Infant Mortality Rate	**73.4** Maternal Mortality Rate	**10.4** Chronic Malnutrition	**9.1%** Population Disabled		
Clean Water Vulnerability	**17.7%** Households without Access to Improved Water	**6.0%** Households without Access to Flush Toilets				
Information Access Vulnerability	**14.7%** Illiteracy	**79.9%** Primary School Enrollment	**92.4%** Households without Internet	**18.2%** Households without TV	**51.1%** Households without Radio	**5.7** Average years of Schooling
Economic Constraints	**59.3** Economic Dependency Ratio	**47.3%** Population in Poverty	**25.0%** CEP Beneficiaries			
Gender Inequality	**34.9%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.50** Female to Male Labor Ratio			
Population Pressures	**0.68%** Average Annual Population Change	**4.8%** Average Annual Urban Population Change				

[145] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[146] Rank: 18 of 32 Provinces (Score: 0.462) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Governance**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

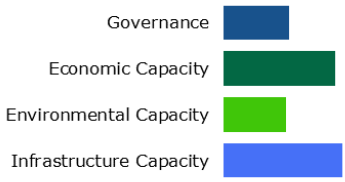


Table 115. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.92** Debt to Service Ratio	**93.1%** Employment Rate (Male)	**RD$ 22,498** Average Annual Income per Capita			
Governance	**70.1%** Registered Voter Participation (2016 Election)	**26.8** Homicide Rate per 100k persons	**74.3%** Households with Garbage Collection			
Environmental Capacity	**20.8%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.7** Hospital Beds per 10,000 Persons	**13.4** Nurses per 10,000 Persons	**12.9** Physicians per 10,000 Persons	**2.5 km** Average Distance to Nearest Hospital	**0.81** Vaccination Index[147]	
Communications Capacity	**22.1%** Households with Access to Fixed Phone Line	**74.4%** Households with Access to Mobile Phone				
Transportation Capacity	**15.4 km** Average Distance to Nearest Port or Airport	**0.63 km** Total Length of Road per km^2 (area)				

[146] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[147] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[148] Rank: 14 of 32 Provinces (Score: 0.506)

Peravia's score and ranking are due to moderate Vulnerability combined with moderate Coping Capacity scores. Peravia ranks 14th in Vulnerability and 18th in Coping Capacity.

Table 116. The 3 Thematic areas with the Weakest Relative Scores

Population Pressures	**Environmental Capacity**	**Governance**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[149] Rank: 23 of 32 Provinces (Score: 0.490)

Peravia's score and ranking are due to low Multi-Hazard Exposure combined with moderate Vulnerability and Coping Capacity.

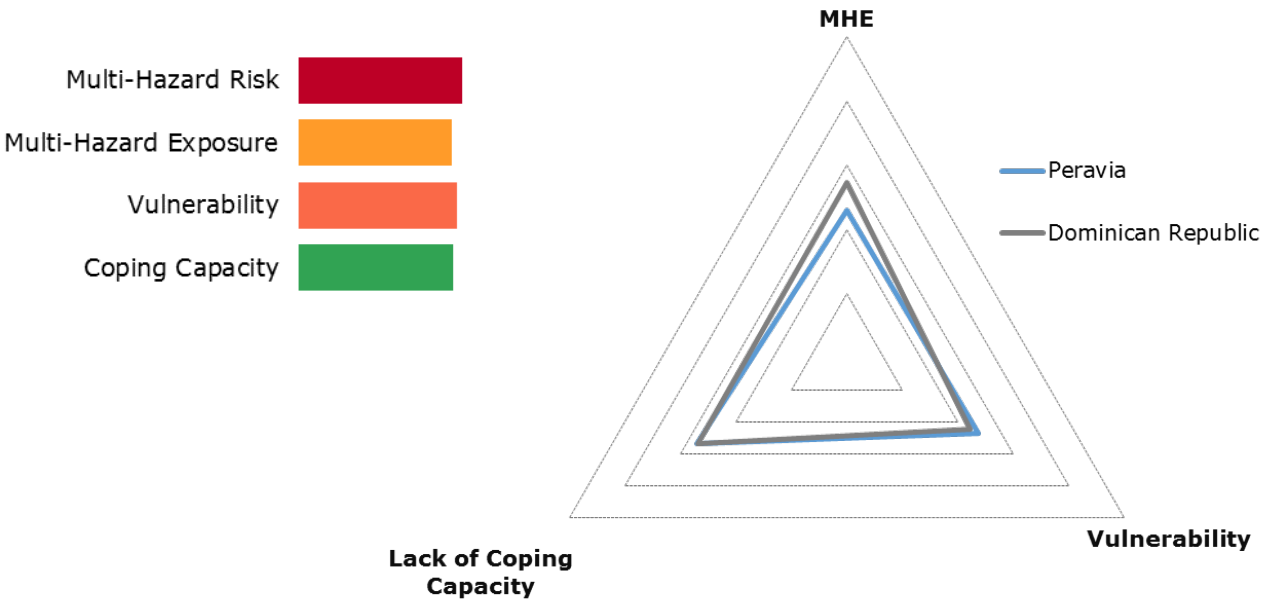


Figure 50. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[148] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[149] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low economic constraints

Ranked 23 of 32 provinces, low economic constraints indicate that Peravia may be able to invest in additional mitigation and preparedness measures at the local and community level.

High overall infrastructure capacity

Ranked 6 of 32 provinces, well developed infrastructure – communication, health care, transportation - facilitates the exchange of information, and physical distribution of goods and services to the population.

Recommendations

01

Increase environmental programs

Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

02

Reduce population pressure

Rapid population changes are difficult to plan for, and can destabilize social, economic, and environmental systems. Analyze trends in the province to determine potential population changes and increase the update frequency of plans and SOPS to accommodate the changes.

03

Increase governance

High crime rates result in low governance scores. Youth-education programs, increased law enforcement, and personal safety-education messages can decrease crime and increase coping capacity.

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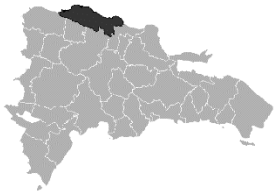
Puerto Plata

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Puerto Plata

Province Capital: San Felipe de Puerto Plata



Area: 2,048 km^2

The northern province of Puerto Plata is known for agribusiness and ecotourism, with coffee and tobacco-growing regions and beaches contributing to the local and national economy.

330,439
Population
(2017)

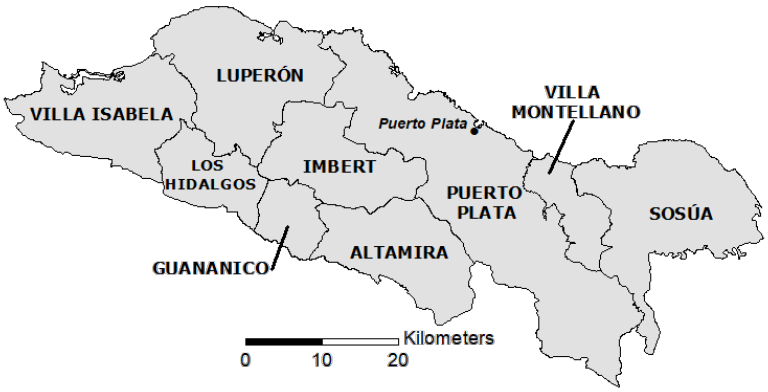
35.7%
Population in Poverty

14.3%
Illiterate Population

15.7
Infant Mortality Rate

81.5%
Access to Improved Water

Municipality	Population
Puerto Plata	163,137
Altamira	19,380
Guananico	6,505
Imbert	22,666
Los Hidalgos	12,987
Luperón	16,911
Sosúa	50,956
Villa Isabela	17,637
Villa Montellano	20,260



Multi-Hazard Risk Rank: Medium (18 of 32)

Lack of Resilience Rank: Very Low (30 of 32)

RVA Component Scores

Table 117. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Medium		**Very Low**		**Very High**		**Very Low**		**Very High**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.516	18	0.366	30	0.815	3	0.311	30	0.579	3

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[150] Rank: 3 of 32 Provinces (Score: 0.815)

Table 118. Estimated ambient population[151] exposed to each hazard

Cyclone

100%

379,762 People

Earthquake

100%

379,762 People

Landslide

63%

240,132 People

Flood

54%

204,277 People

Tsunami

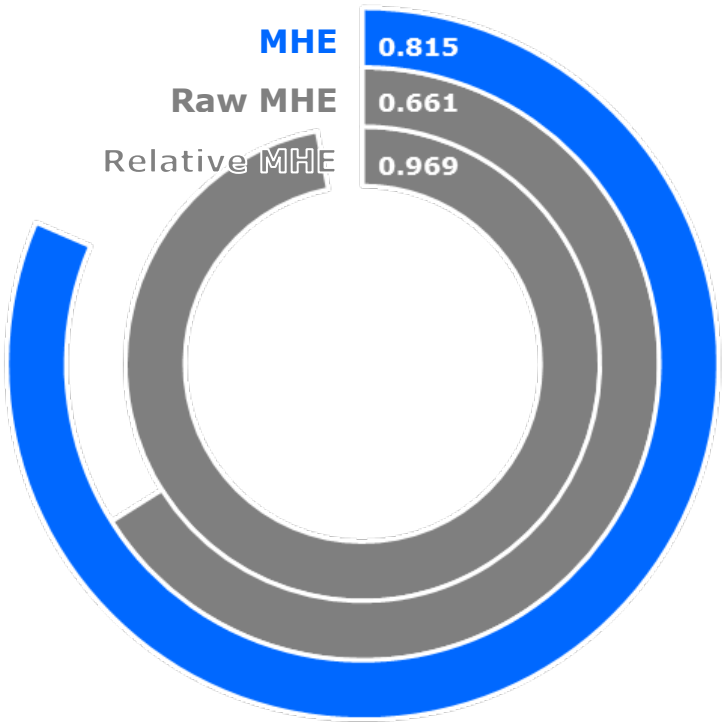
29%

109,905 People

Case Study: Earthquake Resilience in Puerto Plata

With high seismic risk, Puerto Plata has many poor inhabitants exposed to inadequate infrastructure. In order to improve the resilience of the Province, UNDP instituted a project – "Communities Resilient to Earthquakes and Tsunamis in Puerto Plata" – in coordination with CODIA and UASD. Through this program, over "200 master builders and 30 professional engineers and architects" were trained on earthquake-resistant building. In addition, "1,000 families were briefed on how to construct quake-resistant buildings through the distribution of flyers with information on existing national regulations."

"Dominican Republic: Ready to act when faced with disaster" - UNDP



[150] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[151] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[152] Rank: 30 of 32 Provinces (Score: 0.311)
Vulnerability is influenced by moderate subcomponent scores in the thematic areas of **Gender Inequality, Environmental Stress,** and **Population Pressures**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

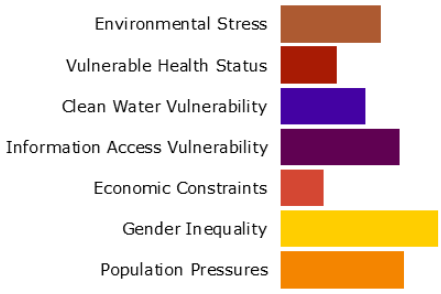


Table 119. Component Scores for each Vulnerability Sub-component

	Environmental Stress	**7.1%** Province Susceptible to Drought	**-2.5%** Average Annual Forest Change				
	Vulnerable Health Status	**15.7** Infant Mortality Rate	**67.4** Maternal Mortality Rate	**7.8** Chronic Malnutrition	**4.8%** Population Disabled		
	Clean Water Vulnerability	**18.5%** Households without Access to Improved Water	**5.1%** Households without Access to Flush Toilets				
	Information Access Vulnerability	**14.3%** Illiteracy	**88.0%** Primary School Enrollment	**87.6%** Households without Internet	**26.5%** Households without TV	**53.0%** Households without Radio	**6.6** Average years of Schooling
	Economic Constraints	**52.9** Economic Dependency Ratio	**35.7%** Population in Poverty	**25.2%** CEP Beneficiaries			
	Gender Inequality	**34.9%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.45** Female to Male Labor Ratio			
	Population Pressures	**0.34%** Average Annual Population Change	**2.4%** Average Annual Urban Population Change				

[152] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[153] Rank: 3 of 32 Provinces (Score: 0.579) Puerto Plata has relatively weak scores in the thematic areas of **Environmental Capacity** and **Infrastructure (Health Care Capacity)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

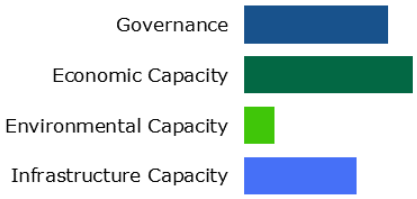


Table 120. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.50** Debt to Service Ratio	**91.6%** Employment Rate (Male)	**RD$ 30,394** Average Annual Income per Capita			
Governance	**75.1%** Registered Voter Participation (2016 Election)	**15.0** Homicide Rate per 100k persons	**73.2%** Households with Garbage Collection			
Environmental Capacity	**9.3%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**9.5** Hospital Beds per 10,000 Persons	**10.7** Nurses per 10,000 Persons	**9.2** Physicians per 10,000 Persons	**3.2 km** Average Distance to Nearest Hospital	**0.76** Vaccination Index[154]
Communications Capacity	**17.1%** Households with Access to Fixed Phone Line	**76.2%** Households with Access to Mobile Phone			
Transportation Capacity	**21.2 km** Average Distance to Nearest Port or Airport	**0.55 km** Total Length of Road per km^2 (area)			

[153] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[154] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[155] Rank: 30 of 32 Provinces (Score: 0.366)

Puerto Plata's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Puerto Plata ranks 30th in Vulnerability and 3rd in Coping Capacity.

Table 121. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity	**Health Care Infrastructure Capacity**	**Environmental Stress**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[156] Rank: 18 of 32 Provinces (Score: 0.516)

Puerto Plata's score and ranking are due to very high Multi-Hazard Exposure combined with very low Vulnerability and very high Coping Capacity.

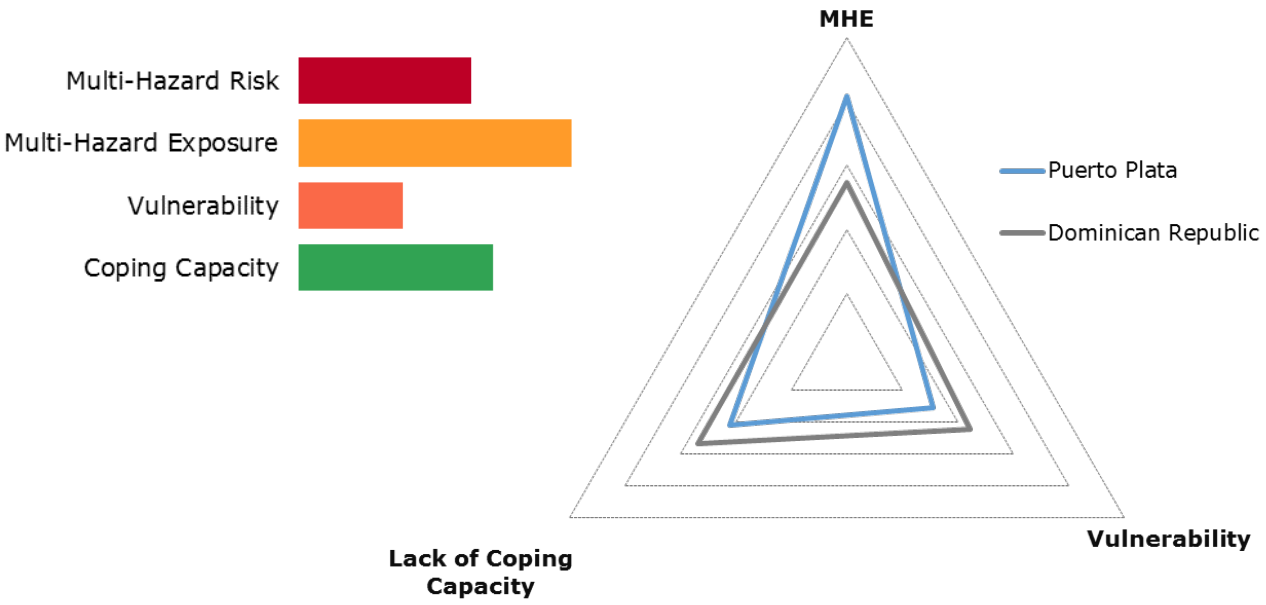


Figure 51. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[155] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[156] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High overall governance
Ranked 4 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Low vulnerable health status
Ranked 31 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Low economic constraints
Ranked 28 of 32 provinces, low economic constraints indicate that Puerto Plata may be able to invest in additional mitigation and preparedness measures at the local and community level.

Recommendations

01

Reduce environmental stress
Invest in drought and erosion mitigation projects to reduce environmental stress and degradation.

02

Increase environmental programs
Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

03

Increase health education and access
Provide increased access to healthcare services through construction of facilities, incentive programs for doctors and nurses to practice in remote areas, and general health-education programs for the population. Increasing healthcare access facilitates access to vital resources before, during, and after a disaster event.

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Samaná

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Samaná

Province Capital: Samaná City

Area: 973 km^2

The northeast province of Samaná serves as a commercial and manufacturing center for the hinterland, which yields timber, cacao, coconuts, rice, and marble. Tanning is also an important economic activity.

109,226
Population
(2017)

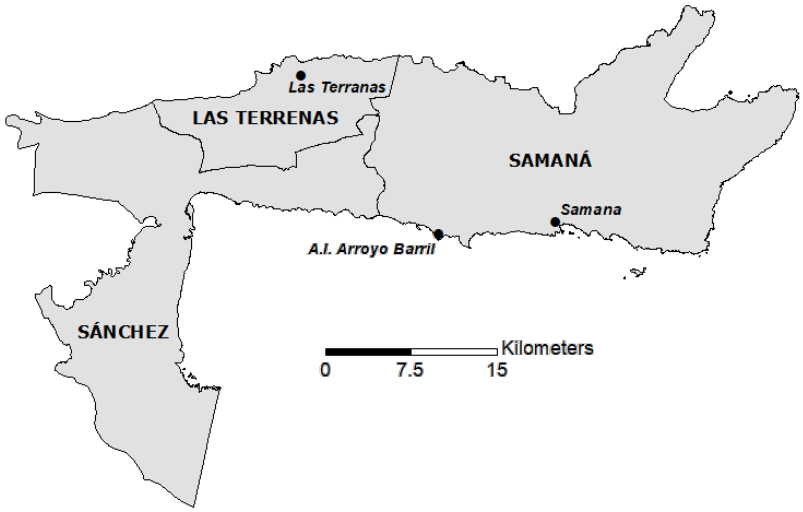
47.7%
Population in Poverty

15.4%
Illiterate Population

10.4
Infant Mortality Rate

73.2%
Access to Improved Water

Municipality	Population
Samaná	62,589
Sánchez	26,376
Las Terrenas	2,219



Multi-Hazard Risk Rank: Medium (20 of 32)

Lack of Resilience Rank: Medium (17 of 32)

RVA Component Scores

Table 122. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Medium		**Medium**		**Medium**		**Medium**		**Medium**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.507	20	0.491	17	0.540	18	0.446	16	0.463	16

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[157] Rank: 18 of 32 Provinces (Score: 0.540)

Table 123. Estimated ambient population[158] exposed to each hazard

Cyclone

100%

111,079 People

Earthquake

100%

111,079 People

Landslide

65%

71,811 People

Flood

14%

15,565 People

Tsunami

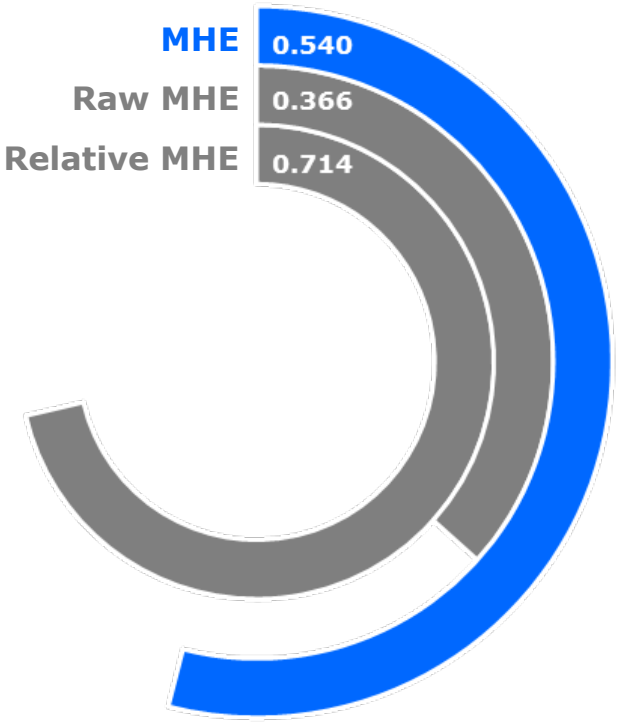
22%

24,471 People

Case Study: Conservation in Samaná

In the Province of Samaná, an NGO is working towards the conservation of the province's natural resources and areas through community participation and sustainable development. Established in 1991, The Center for the Conservation of Samaná Bay and its Surroundings focuses on coordinating conservation efforts with the development of the province, requiring legitimate community buy-in as well as engagement from the private sector and national government. Actions include community participation, training and environmental education, sustainable development, and biodiversity conservation – in the hopes of alleviating poverty and protecting the province's natural resources.

- *Center for the Conservation and Eco-Development of Samaná Bay and its Surroundings, http://www.dlwap.de/cebse/body_cebse.html*



[157] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[158] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[159] Rank: 16 of 32 Provinces (Score: 0.446) Vulnerability in Samaná is influenced by **Population Pressures, Information Access Vulnerability,** and **Environmental Stress**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

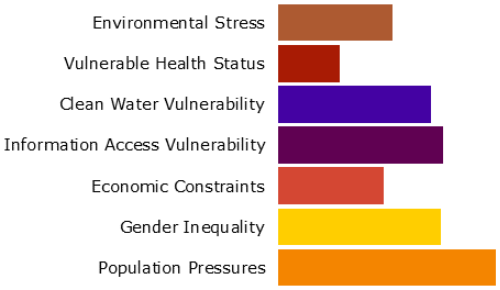


Table 124. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-4.9%** Average Annual Forest Change					
Vulnerable Health Status	**10.4** Infant Mortality Rate	**94.4** Maternal Mortality Rate	**11.1** Chronic Malnutrition	**4.6%** Population Disabled			
Clean Water Vulnerability	**26.8%** Households without Access to Improved Water	**10.9%** Households without Access to Flush Toilets					
Information Access Vulnerability	**15.4%** Illiteracy	**86.3%** Primary School Enrollment	**94.6%** Households without Internet	**26.4%** Households without TV	**59.8%** Households without Radio	**6.3** Average years of Schooling	
Economic Constraints	**55.8** Economic Dependency Ratio	**47.7%** Population in Poverty	**35.8%** CEP Beneficiaries				
Gender Inequality	**40.9%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.45** Female to Male Labor Ratio				
Population Pressures	**1.03%** Average Annual Population Change	**6.5%** Average Annual Urban Population Change					

[159] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[160] Rank: 16 of 32 Provinces (Score: 0.463) The thematic areas with the weakest relative scores are **Governance, and Infrastructure (Health Care Capacity and Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

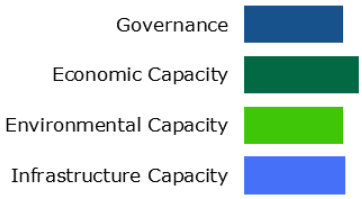


Table 125. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.85** Debt to Service Ratio	**90.6%** Employment Rate (Male)	**RD$ 27,992** Average Annual Income per Capita			
Governance	**77.1%** Registered Voter Participation (2016 Election)	**20.7** Homicide Rate per 100k persons	**54.9%** Households with Garbage Collection			
Environmental Capacity	**30.3%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.5** Hospital Beds per 10,000 Persons	**18.6** Nurses per 10,000 Persons	**14.6** Physicians per 10,000 Persons	**4.0 km** Average Distance to Nearest Hospital	**0.38** Vaccination Index[161]	
Communications Capacity	**6.5%** Households with Access to Fixed Phone Line	**72.8%** Households with Access to Mobile Phone				
Transportation Capacity	**9.6 km** Average Distance to Nearest Port or Airport	**0.51 km** Total Length of Road per km^2 (area)				

[160] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[161] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[162] Rank: 17 of 32 Provinces (Score: 0.491)

Samaná's score and ranking are due to moderate Vulnerability combined with moderate Coping Capacity scores. Samaná ranks 16th in Vulnerability and 16th in Coping Capacity.

Table 126. The 3 Thematic areas with the Weakest Relative Scores

Population Pressures

Health Care Infrastructure Capacity

Communications Infrastructure Capacity

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[163] Rank: 20 of 32 Provinces (Score: 0.507)

Samaná's score and ranking are due to moderate Multi-Hazard Exposure combined with moderate Vulnerability and Coping Capacity.

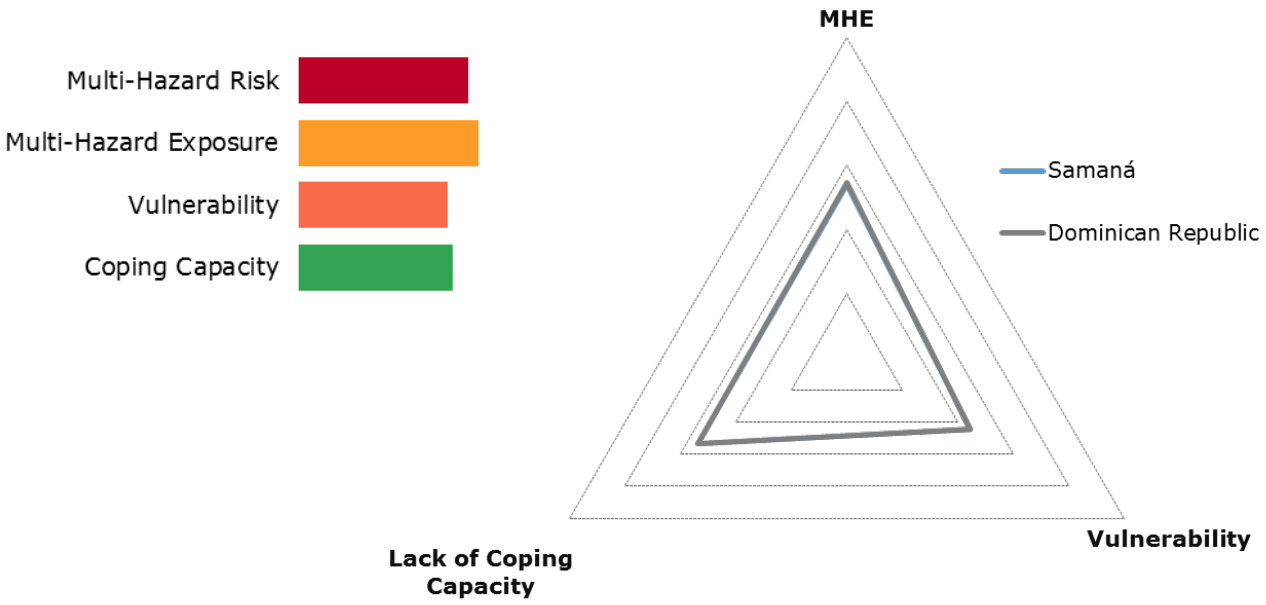


Figure 52. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[162] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[163] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High transportation capacity
Ranked 7 of 32 provinces, well developed transportation networks facilitate the movement of goods and services, decreasing wait times for response and relief supplies.

High environmental capacity
Ranked 8 of 32 provinces, high environmental capacity indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Low vulnerable health status
Ranked 30 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Recommendations

01

Reduce population pressure
Rapid population changes are difficult to plan for, and can destabilize social, economic, and environmental systems. Analyze trends in the province to determine potential population changes and increase the update frequency of plans and SOPS to accommodate the changes.

02

Invest in communication infrastructure
Invest in communication infrastructure to allow for easier access to information and education material, increasing literacy and situational awareness of the population.

03

Increase health education and access
Provide increased access to healthcare services through construction of facilities, incentive programs for doctors and nurses to practice in remote areas, and general health-education programs for the population. Increasing healthcare access facilitates access to vital resources before, during, and after a disaster event.

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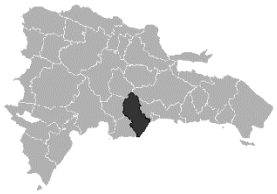
San Cristóbal

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: San Cristóbal

Province Capital: San Cristóbal



Area: 1,388 km^2

San Cristóbal is located in the south-central part of the country near the national capital. Main contributions to the economy include industry, agriculture, port activities and tourism.

618,165
Population
(2017)

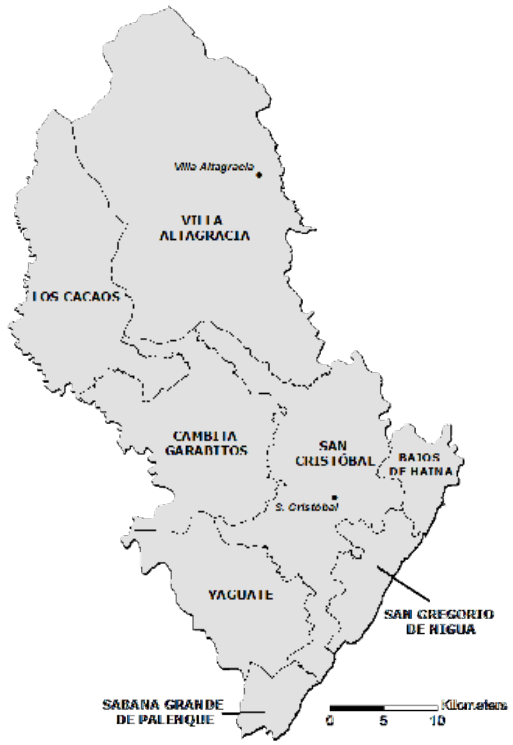
35.9%
Population in Poverty

12.1%
Illiterate Population

17.1
Infant Mortality Rate

84.3%
Access to Improved Water

Municipality	Population
San Cristóbal	252,469
Sabana Grande De Palanque	16,776
Bajos De Haina	134,705
Cambita Garabitos	33,683
Villa Altagracia	91,446
Yaguate	45,908
San Gregorio De Nigua	32,831
Los Cacaos	10,347



Multi-Hazard Risk Rank: Very Low (28 of 32)

Lack of Resilience Rank: Low (25 of 32)

RVA Component Scores

Table 127. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very Low		Low		Medium		Very Low		Medium	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.451	28	0.437	25	0.478	20	0.338	27	0.463	17

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[164] Rank: 20 of 32 Provinces (Score: 0.478)

Table 128. Estimated ambient population[165] exposed to each hazard

Cyclone

100%

647,479 People

Earthquake

18%

116,801 People

Landslide

77%

500,298 People

Flood

20%

128,283 People

Tsunami

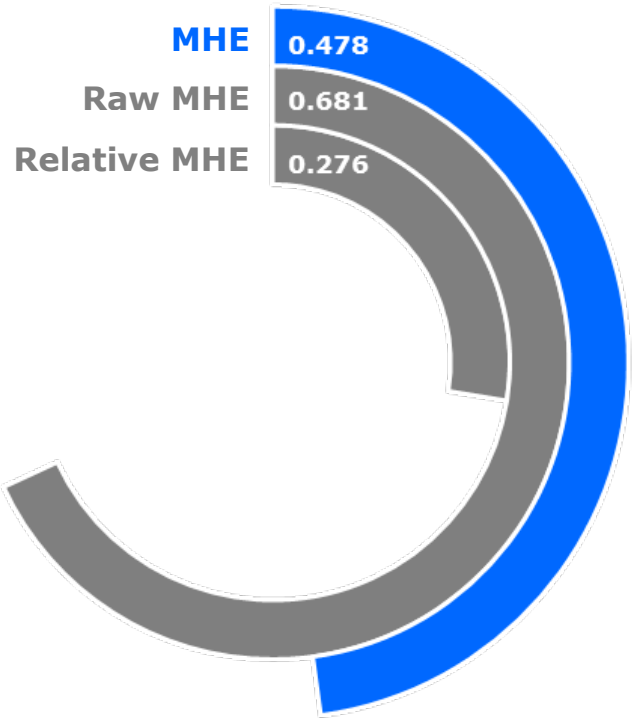
8%

51,612 People

Case Study: Community Protection in San Cristóbal

Over a one-year period, a pilot program was instituted in the Province of San Cristóbal to establish community-based protection brigades, designed to address threats of abuse and lack of access to essential services for vulnerable populations affected by disasters. The riverside urban barrios of San Cristóbal experience "poverty and a lack of adequate land planning", resulting in "extreme risk of being washed away when the next hurricane, tropical storm or flash flood takes place." As such, efforts were made to train and organize communities to form "specialized protection brigades" responsible for DRR and community protection.

"Integrating protection into disaster risk preparedness in the Dominican Republic" – Andrea Verdeja, October 2016



[164] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[165] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[166] Rank: 27 of 32 Provinces (Score: 0.338) Vulnerability in San Cristóbal is influenced by **Population Pressures** and **Clean Water Vulnerability**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

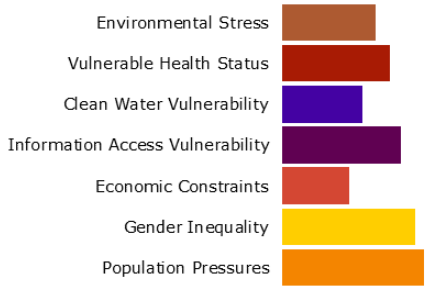


Table 129. Component Scores for each Vulnerability Sub-component

Environmental Stress	**12%** Province Susceptible to Drought	**-1.1%** Average Annual Forest Change					
Vulnerable Health Status	**17.1** Infant Mortality Rate	**88.0** Maternal Mortality Rate	**10.1** Chronic Malnutrition	**6.8%** Population Disabled			
Clean Water Vulnerability	**15.7%** Households without Access to Improved Water	**6.0%** Households without Access to Flush Toilets					
Information Access Vulnerability	**12.1%** Illiteracy	**89.8%** Primary School Enrollment	**91.0%** Households without Internet	**20.2%** Households without TV	**55.0%** Households without Radio	**6.6** Average years of Schooling	
Economic Constraints	**58.1** Economic Dependency Ratio	**35.9%** Population in Poverty	**26.6%** CEP Beneficiaries				
Gender Inequality	**37.3%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.39** Female to Male Labor Ratio				
Population Pressures	**1.1%** Average Annual Population Change	**1.0%** Average Annual Urban Population Change					

[166] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[167] Rank: 17 of 32 Provinces (Score: 0.463) The thematic areas with the weakest relative scores are **Environmental Capacity, Economic Capacity,** and **Health Care Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

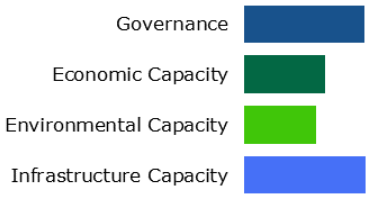


Table 130. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.02** Debt to Service Ratio	**91.9%** Employment Rate (Male)	**RD$ 20,106** Average Annual Income per Capita			
Governance	**76.4%** Registered Voter Participation (2016 Election)	**19.5** Homicide Rate per 100k persons	**68.6%** Households with Garbage Collection			
Environmental Capacity	**22.0%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**7.9** Hospital Beds per 10,000 Persons	**12.6** Nurses per 10,000 Persons	**12.2** Physicians per 10,000 Persons	**3.2 km** Average Distance to Nearest Hospital	**0.88** Vaccination Index[168]
Communications Capacity	**17.3%** Households with Access to Fixed Phone Line	**77.8%** Households with Access to Mobile Phone			
Transportation Capacity	**22.7 km** Average Distance to Nearest Port or Airport	**0.74 km** Total Length of Road per km^2 (area)			

[167] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[168] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[169] Rank: 25 of 32 Provinces (Score: 0.437)

San Cristóbal's score and ranking are due to very low Vulnerability combined with moderate Coping Capacity scores. San Cristóbal ranks 27th in Vulnerability and 17th in Coping Capacity.

Table 131. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity

Economic Capacity

Health Care Infrastructure Capacity

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[170] Rank: 28 of 32 Provinces (Score: 0.451)

San Cristóbal's score and ranking are due to low Multi-Hazard Exposure combined with very low Vulnerability and moderate Coping Capacity.

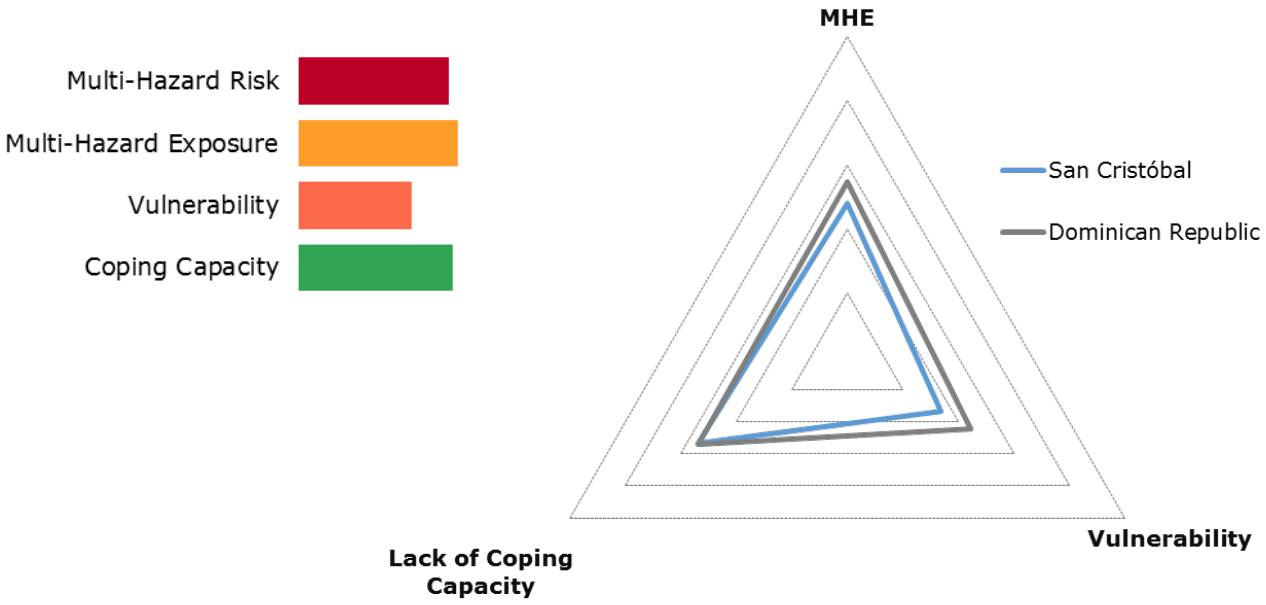


Figure 53. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[169] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[170] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High information access
High information access indicates that the population has an increased ability to access and comprehend disaster-related information before, during, and after events.

Low gender inequality
Ranked 26 of 32 provinces, low gender inequality indicates that vulnerable populations are more likely to have their needs met under 'normal' conditions and may be less susceptible during times of disaster.

High transportation capacity
Ranked 9 of 32 provinces, well developed transportation networks facilitate the movement of goods and services, decreasing wait times for response and relief supplies.

Recommendations

01

Increase economic capacity
Encourage business development and education programs to increase economic opportunities in the region.

02

Increase health education and access
Provide increased access to healthcare services through construction of facilities, incentive programs for doctors and nurses to practice in remote areas, and general health-education programs for the population. Increasing healthcare access facilitates access to vital resources before, during, and after a disaster event.

03

Increase environmental programs
Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

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Safer world.

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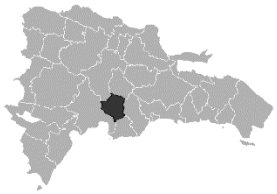
San José de Ocoa

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: San José de Ocoa

Province Capital: San José de Ocoa



Area: 955 km^2

Located in the southern foothills of the Cordillera Central (mountain), San José de Ocoa economy is fueled by forestry, fishing and agriculture including the production of coffee, potatoes, beans, carrots, cabbage, peanuts and avocados.

56,027
Population
(2017)

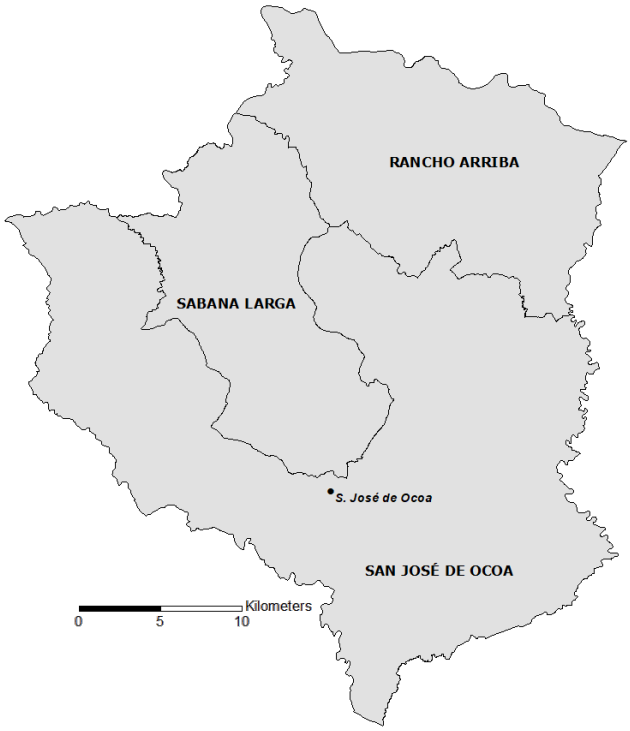
59.3%
Population in Poverty

24.3%
Illiterate Population

17.6
Infant Mortality Rate

90.4%
Access to Improved Water

Municipality	Population
San José De Ocoa	37,114
Sabana Larga	9,214
Rancho Arriba	9,699



Multi-Hazard Risk Rank: Very Low (32 of 32)

Lack of Resilience Rank: Medium (15 of 32)

RVA Component Scores

Table 132. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very Low		Medium		Very Low		High		Medium	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.393	32	0.503	15	0.172	30	0.476	13	0.470	15

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[171] Rank: 30 of 32 Provinces (Score: 0.172)

Table 133. Estimated ambient population[172] exposed to each hazard

Cyclone

100%

74,851 People

Earthquake

14%

10,189 People

Landslide

81%

60,664 People

Flood

6%

4,510 People

Tsunami

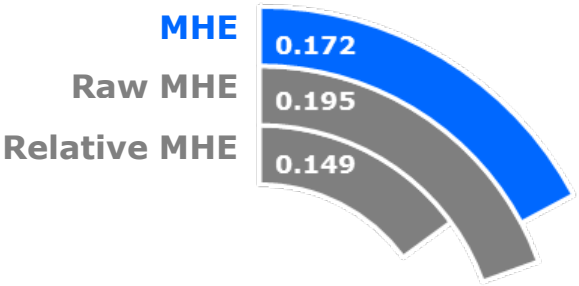
0%

0 People

Case Study: Fog Collection in San José de Ocoa

In the mountain province of San José de Ocoa, rural communities frequently experience water shortages. To address this issue, various projects have explored the idea of fog collection and whether it could potentially "provide additional water to… rural villages." In collaboration with Asociacion para el Desarrollo de San José de Ocoa Inc. (ADESJO), fog collection has included needs analyses for "clean drinking water, especially in the dry winter season," as well as "an examination of the local topography." Projects have proven successful, demonstrating that fog collection can provide substantial water to rural communities, alongside rainwater collection and storage.

"Fog Collection Evaluation Project" - http://www.fogquest.org/project-information/projects/dominican-republic/



[171] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[172] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[173] Rank: 13 of 32 Provinces (Score: 0.476) Vulnerability in San José de Ocoa is influenced by **Gender Inequality, Information Access Vulnerability,** and **Vulnerable Health Status**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

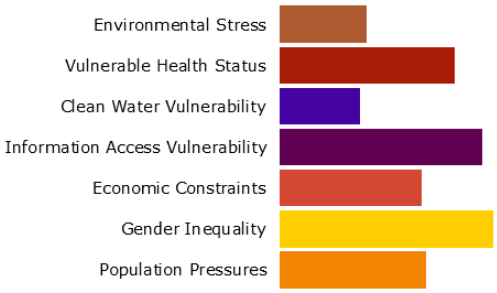


Table 134. Component Scores for each Vulnerability Sub-component

Environmental Stress	**6.3%** Province Susceptible to Drought	**-1.4%** Average Annual Forest Change					
Vulnerable Health Status	**17.6** Infant Mortality Rate	**97.8** Maternal Mortality Rate	**12.6** Chronic Malnutrition	**10.7%** Population Disabled			
Clean Water Vulnerability	**9.6%** Households without Access to Improved Water	**9.4%** Households without Access to Flush Toilets					
Information Access Vulnerability	**22.0%** Illiteracy	**89.0%** Primary School Enrollment	**96.5%** Households without Internet	**41.5%** Households without TV	**59.4%** Households without Radio	**5.4** Average years of Schooling	
Economic Constraints	**55.0** Economic Dependency Ratio	**59.3%** Population in Poverty	**42.1%** CEP Beneficiaries				
Gender Inequality	**34.9%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.53** Female to Male Labor Ratio				
Population Pressures	**0.90%** Average Annual Population Change	**1.7%** Average Annual Urban Population Change					

[173] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[174] Rank: 15 of 32 Provinces (Score: 0.470) The thematic areas with the weakest relative scores are **Economic Capacity and Infrastructure (Transportation and Communications)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

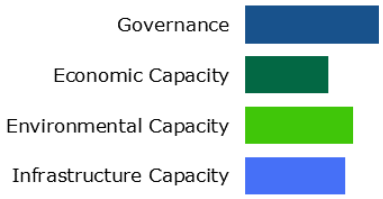


Table 135. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.03** Debt to Service Ratio	**92.0%** Employment Rate (Male)	**RD$ 20,683** Average Annual Income per Capita			
Governance	**76.7%** Registered Voter Participation (2016 Election)	**17.3** Homicide Rate per 100k persons	**69.8%** Households with Garbage Collection			
Environmental Capacity	**32.8%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**17.5** Hospital Beds per 10,000 Persons	**22.2** Nurses per 10,000 Persons	**19.8** Physicians per 10,000 Persons	**3.4 km** Average Distance to Nearest Hospital	**0.79** Vaccination Index[175]	
Communications Capacity	**8.6%** Households with Access to Fixed Phone Line	**69.1%** Households with Access to Mobile Phone				
Transportation Capacity	**36.0 km** Average Distance to Nearest Port or Airport	**0.44 km** Total Length of Road per km^2 (area)				

[174] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[175] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[176] Rank: 15 of 32 Provinces (Score: 0.503)

San José de Ocoa's score and ranking are due to moderate Vulnerability combined with moderate Coping Capacity scores. San José de Ocoa ranks 13th in Vulnerability and 15th in Coping Capacity.

Table 136. The 3 Thematic areas with the Weakest Relative Scores

Vulnerable Health Status

Transportation Infrastructure Capacity

Communications Infrastructure Capacity

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[177] Rank: 32 of 32 Provinces (Score: 0.393)

San José de Ocoa's score and ranking are due to very low Multi-Hazard Exposure combined with moderate Vulnerability and Coping Capacity.

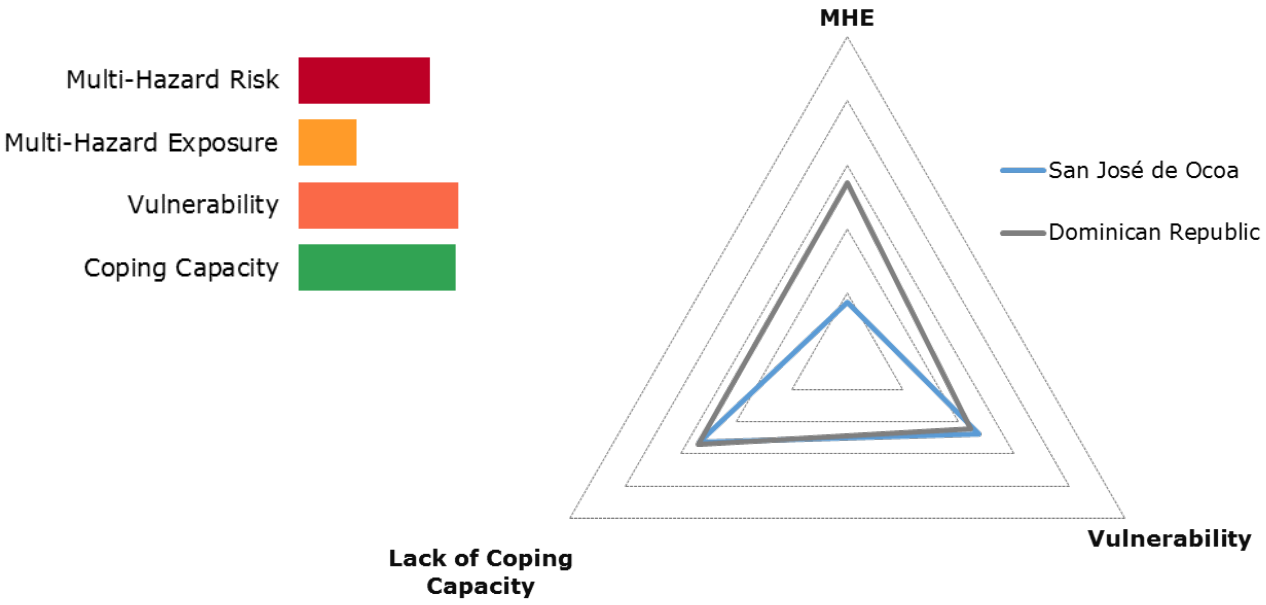


Figure 54. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[176] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[177] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High environmental capacity
Ranked 6 of 32 provinces, high environmental capacity indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Lowest overall multi-hazard risk
Ranked 30th in Multi-Hazard Exposure, 13th in Vulnerability, and 15th in Coping Capacity. Low multi-hazard risk indicates a low susceptibility to impact and the ability to absorb, respond to, and recover from negative impacts that occur over the short term (Coping Capacity).

High overall governance
Ranked 8 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Recommendations

01

Increase health education
Provide health-education services for the population, especially new mothers and other special needs populations.

02

Invest in communication infrastructure
Invest in communication infrastructure to allow for easier access to information and education material, increasing literacy and situational awareness of the population.

03

Invest in transportation infrastructure
Investing in transportation infrastructure will facilitate the distribution of goods and services before, during, and after a disaster event.

Better solutions.
Fewer disasters.
Safer world.

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San Juan

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: San Juan

Province Capital: San Juan de la Maguana

Area: 3,774 km^2

Located in the valley region, San Juan is the largest province in Dominican Republic. Economic activities include livestock and agriculture and the province several hydro-electric dams.

225,318
Population
(2017)

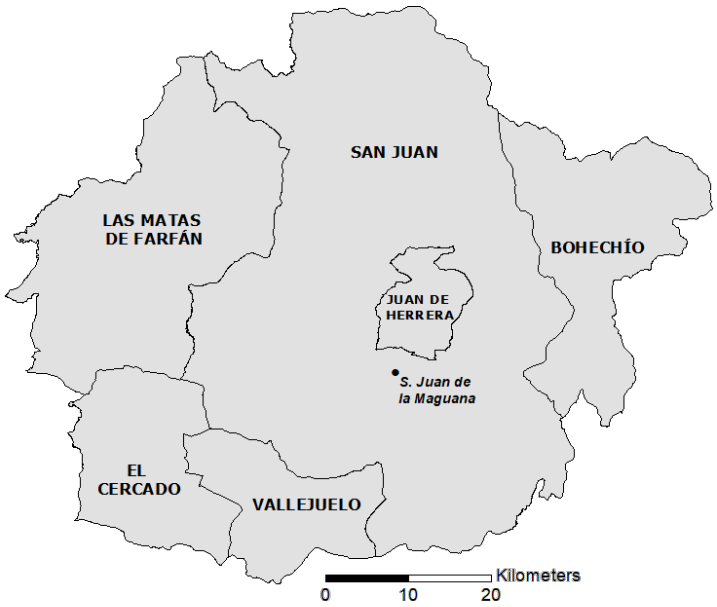
62.2%
Population in Poverty

23.6%
Illiterate Population

15.4
Infant Mortality Rate

86.6%
Access to Improved Water

Municipality	Population
San Juan	128,188
Bohechío	9,393
El Cercado	20,217
Juan De Herrera	12,665
Las Matas De Farfán	42,828
Vallejuelo	12,027



Multi-Hazard Risk Rank: Medium (19 of 32)

Lack of Resilience Rank: Very High (6 of 32)

RVA Component Scores

Table 137. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Medium		Very High		Low		High		Very Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.515	19	0.586	6	0.372	25	0.540	9	0.367	28

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[178] Rank: 25 of 32 Provinces (Score: 0.372)

Table 138. Estimated ambient population[179] exposed to each hazard

Cyclone

100%

291,246 People

Earthquake

1%

4,191 People

Landslide

70%

202,629 People

Flood

46%

133,888 People

Tsunami

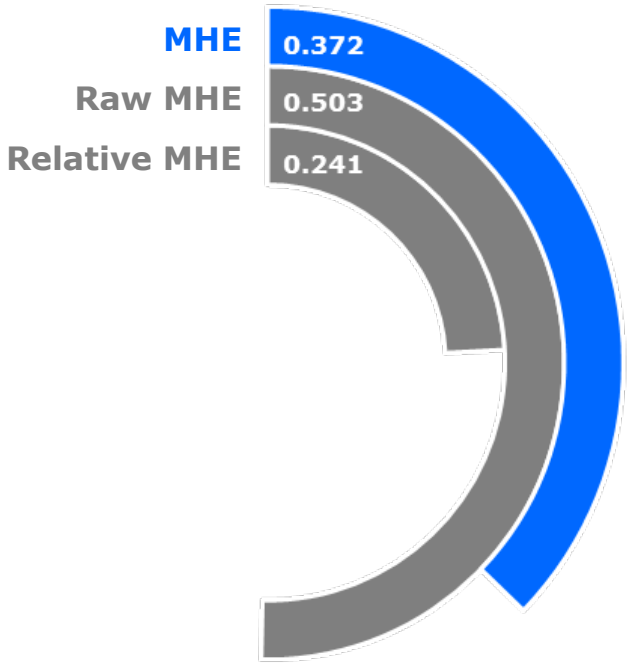
0%

0 People

Case Study: SAFE Agriculture in San Juan

USDA has funded a five year program to "improve agricultural productivity for livestock and expand exports and trade." Known in the Dominican Republic as Progana, the Safe Agriculture/Food Export (SAFE) Program works with "smallholder livestock owners with 100 heads of cattle or less". Farmers are trained on improving management and production techniques, as well as animal nutrition and sanitary concerns. Local farm field schools are used for trainings to provide hands-on experience for the participants. The SAFE Program is expected to significantly increase export earning potential for Dominican farmers.

"Safe Agriculture/Food Export (SAFE) Program" – NGO Aid Map, https://www.ngoaidmap.org/projects/16809



[178] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[179] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[180] Rank: 9 of 32 Provinces (Score: 0.540) Vulnerability in San Juan is influenced by **Economic Constraints, Gender Inequality,** and **Vulnerable Health Status**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

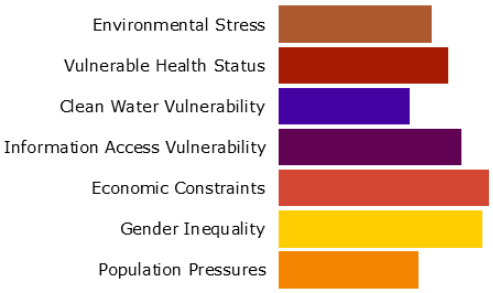


Table 139. Component Scores for each Vulnerability Sub-component

Environmental Stress	**45.8%** Province Susceptible to Drought	**-1.7%** Average Annual Forest Change					
Vulnerable Health Status	**15.4** Infant Mortality Rate	**160.3** Maternal Mortality Rate	**15.2** Chronic Malnutrition	**7.8%** Population Disabled			
Clean Water Vulnerability	**13.4%** Households without Access to Improved Water	**15.0%** Households without Access to Flush Toilets					
Information Access Vulnerability	**23.6%** Illiteracy	**92.8%** Primary School Enrollment	**95.6%** Households without Internet	**34.8%** Households without TV	**57.6%** Households without Radio	**5.4** Average years of Schooling	
Economic Constraints	**66.7** Economic Dependency Ratio	**62.2%** Population in Poverty	**48.1%** CEP Beneficiaries				
Gender Inequality	**33.5%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.55** Female to Male Labor Ratio				
Population Pressures	**0.48%** Average Annual Population Change	**2.8%** Average Annual Urban Population Change					

[180] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[181] Rank: 28 of 32 Provinces (Score: 0.367) San Juan's weakest relative scores are in the thematic areas of **Economic Capacity** and **Infrastructure**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

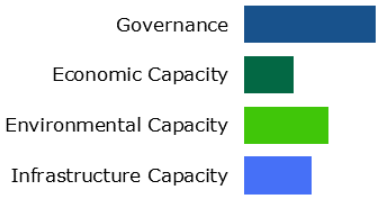


Table 140. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.12** Debt to Service Ratio	**91.3%** Employment Rate (Male)	**RD$ 18,130** Average Annual Income per Capita			
Governance	**78.0%** Registered Voter Participation (2016 Election)	**17.0** Homicide Rate per 100k persons	**63.7%** Households with Garbage Collection			
Environmental Capacity	**25.6%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**17.0** Hospital Beds per 10,000 Persons	**26.9** Nurses per 10,000 Persons	**13.7** Physicians per 10,000 Persons	**4.7 km** Average Distance to Nearest Hospital	**0.37** Vaccination Index[182]
Communications Capacity	**9.8%** Households with Access to Fixed Phone Line	**66.6%** Households with Access to Mobile Phone			
Transportation Capacity	**59.9 km** Average Distance to Nearest Port or Airport	**0.32 km** Total Length of Road per km^2 (area)			

[181] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[182] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[183] Rank: 6 of 32 Provinces (Score: 0.586)

San Juan's score and ranking are due to high Vulnerability combined with very low Coping Capacity scores. San Juan ranks 9th in Vulnerability and 28th in Coping Capacity.

Table 141. The 3 Thematic areas with the Weakest Relative Scores

Transportation Infrastructure Capacity

Economic Capacity

Economic Constraints

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[184] Rank: 19 of 32 Provinces (Score: 0.515)

San Juan's score and ranking are due to high Multi-Hazard Exposure combined with very low Vulnerability and Coping Capacity.

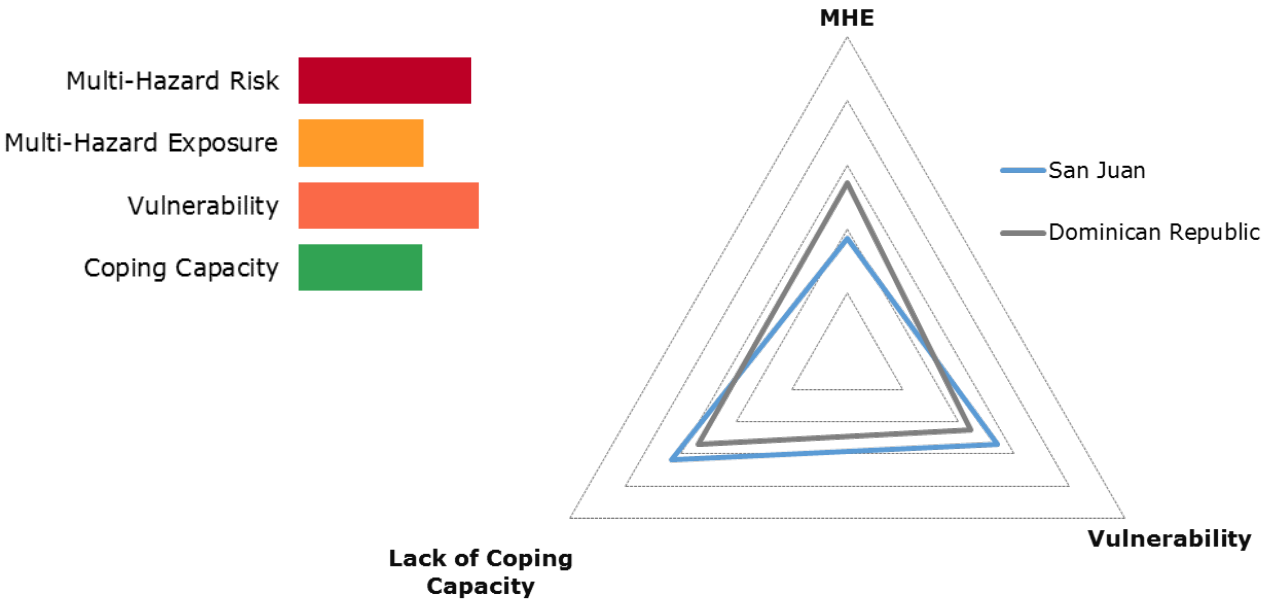


Figure 55. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[183] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[184] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High overall governance
Ranked 10 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

High environmental capacity
Ranked 11 of 32 provinces, high environmental capacity indicates that natural resources and agriculture will be more resilient to the effects of a disaster and may recover faster.

Recommendations

01

Invest in transportation infrastructure
Investing in transportation infrastructure will facilitate the distribution of goods and services before, during, and after a disaster event.

02

Increase economic capacity
Encourage business development and education programs to increase economic opportunities in the region.

Better solutions.
Fewer disasters.
Safer world.

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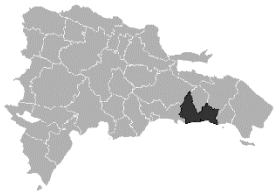
San Pedro de Macorís

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: San Pedro de Macorís

Province Capital: San Pedro de Macorís



Area: 1,403 km^2

Located in the southeast of the country, San Pedro de Macorís is known for the production of sugar. It also includes a commercial port which handles exports of sugar, cement, cattle, and timber. Other industries include corn milling, the manufacture of clothing and soap, and alcohol distilling.

301,215
Population
(2017)

46.7%
Population in Poverty

10.7%
Illiterate Population

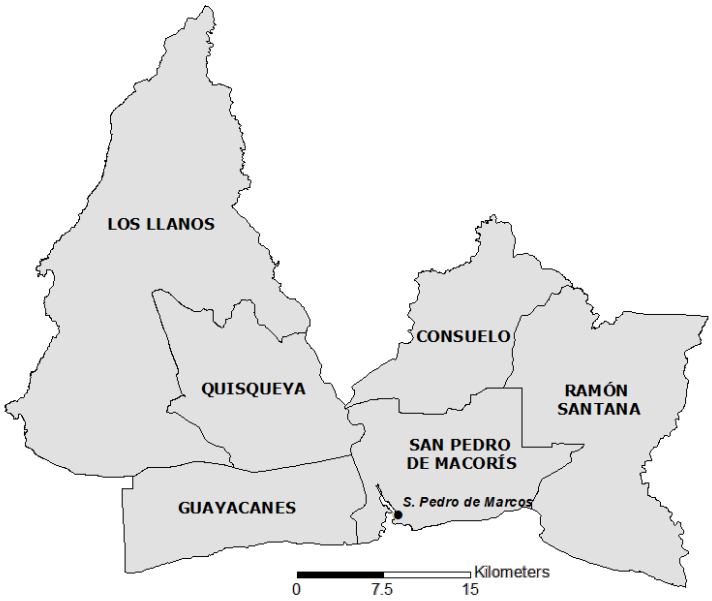
17.9
Infant Mortality Rate

75.6%
Access to Improved Water

Municipality	Population
San Pedro De Macorís	202,545
Los Llanos	23,409
Ramon Santana	9,229
Consuelo	31,163
Quisqueya	19,740
Guayacanes	15,129

Multi-Hazard Risk Rank: Medium (17 of 32)

Lack of Resilience Rank: Low (26 of 32)



RVA Component Scores

Table 142. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Medium		**Low**		**High**		**Low**		**High**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.519	17	0.433	26	0.691	10	0.351	26	0.485	12

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[185] Rank: 10 of 32 Provinces (Score: 0.691)

Table 143. Estimated ambient population[186] exposed to each hazard

Cyclone

100%

364,283 People

Earthquake

100%

364,283 People

Landslide

62%

224,908 People

Flood

14%

50,058 People

Tsunami

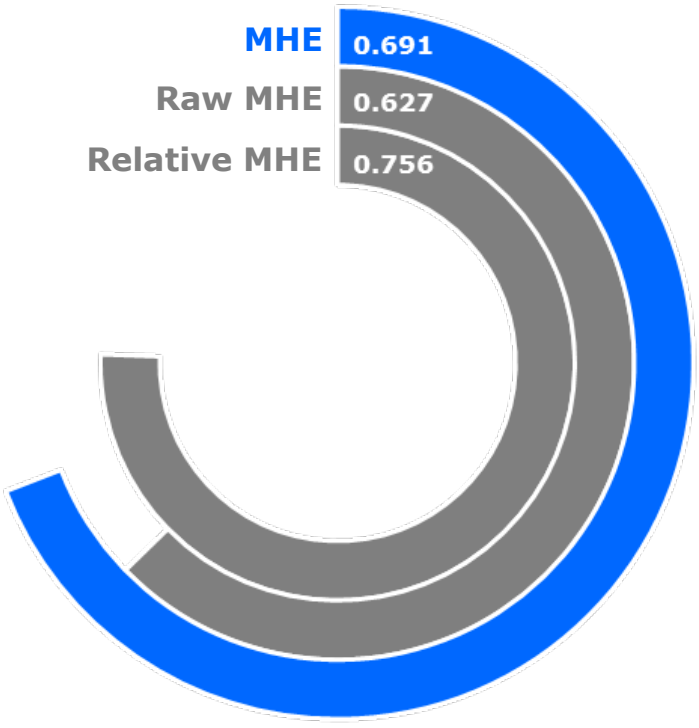
33%

119,080 People

Case Study: Improved Climate Information Project

From March 2015-2018, USAID worked to develop a web-based National Climate Observatory for areas of the Dominican Republic most vulnerable to climate change impacts, including San Pedro de Macorís. This tool promoted effective "climate risk-based decision-making" through local planning efforts. Implemented through Instituto Tecnológico de Santo Domingo, this project supported the training of climate change professionals to enable data gathering and sharing.

"USAID Dominican Republic Factsheet: Improved Climate Information Project" – https://www.climatelinks.org/sites/default/files/asset/document/2.5%20FACT%20SHEET%20-%20Improved%20Climate%20Information%20-%20FINAL.pdf



[185] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[186] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[187] Rank: 26 of 32 Provinces (Score: 0.351) Vulnerability in San Pedro de Macorís is influenced by **Clean Water Vulnerability, Environmental Stress,** and **Gender Inequality.** The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

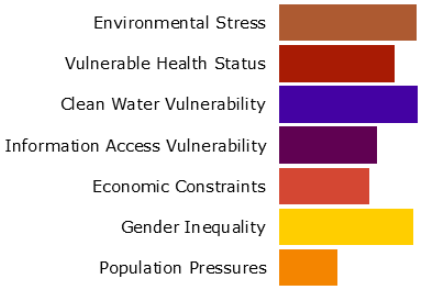


Table 144. Component Scores for each Vulnerability Sub-component

Environmental Stress	**60.8%** Province Susceptible to Drought	**1.9%** Average Annual Forest Change					
Vulnerable Health Status	**17.9** Infant Mortality Rate	**84.5** Maternal Mortality Rate	**8.5** Chronic Malnutrition	**8.2%** Population Disabled			
Clean Water Vulnerability	**24.4%** Households without Access to Improved Water	**10.1%** Households without Access to Flush Toilets					
Information Access Vulnerability	**10.7%** Illiteracy	**94.8%** Primary School Enrollment	**89.8%** Households without Internet	**22.1%** Households without TV	**55.1%** Households without Radio	**6.9** Average years of Schooling	
Economic Constraints	**55.4** Economic Dependency Ratio	**46.7%** Population in Poverty	**31.6%** CEP Beneficiaries				
Gender Inequality	**36.4%** Female Seats in Government	**11** Female to Male Years of Schooling	**0.40** Female to Male Labor Ratio				
Population Pressures	**0.48%** Average Annual Population Change	**0.02%** Average Annual Urban Population Change					

[187] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[188] Rank: 12 of 32 Provinces (Score: 0.485) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

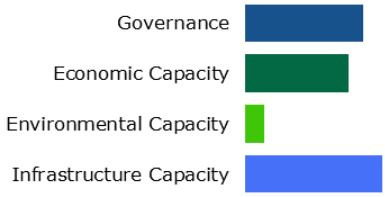


Table 145. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.01** Debt to Service Ratio	**92.2%** Employment Rate (Male)	**RD$ 24,607** Average Annual Income per Capita			
Governance	**72.3%** Registered Voter Participation (2016 Election)	**19.8** Homicide Rate per 100k persons	**77.8%** Households with Garbage Collection			
Environmental Capacity	**6.0%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.0** Hospital Beds per 10,000 Persons	**11.7** Nurses per 10,000 Persons	**23.0** Physicians per 10,000 Persons	**2.9 km** Average Distance to Nearest Hospital	**0.76** Vaccination Index[189]	
Communications Capacity	**18.2%** Households with Access to Fixed Phone Line	**76.9%** Households with Access to Mobile Phone				
Transportation Capacity	**17.6 km** Average Distance to Nearest Port or Airport	**0.94 km** Total Length of Road per km^2 (area)				

[188] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[189] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[190] Rank: 26 of 32 Provinces (Score: 0.433)

San Pedro de Macorís's score and ranking are due to very low Vulnerability combined with high Coping Capacity scores. San Pedro de Macorís ranks 26th in Vulnerability and 12th in Coping Capacity.

Table 146. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity	**Economic Capacity**	**Clean Water Vulnerability**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[191] Rank: 17 of 32 Provinces (Score: 0.519)

San Pedro de Macorís's score and ranking are due to high Multi-Hazard Exposure combined with very low Vulnerability and high Coping Capacity.

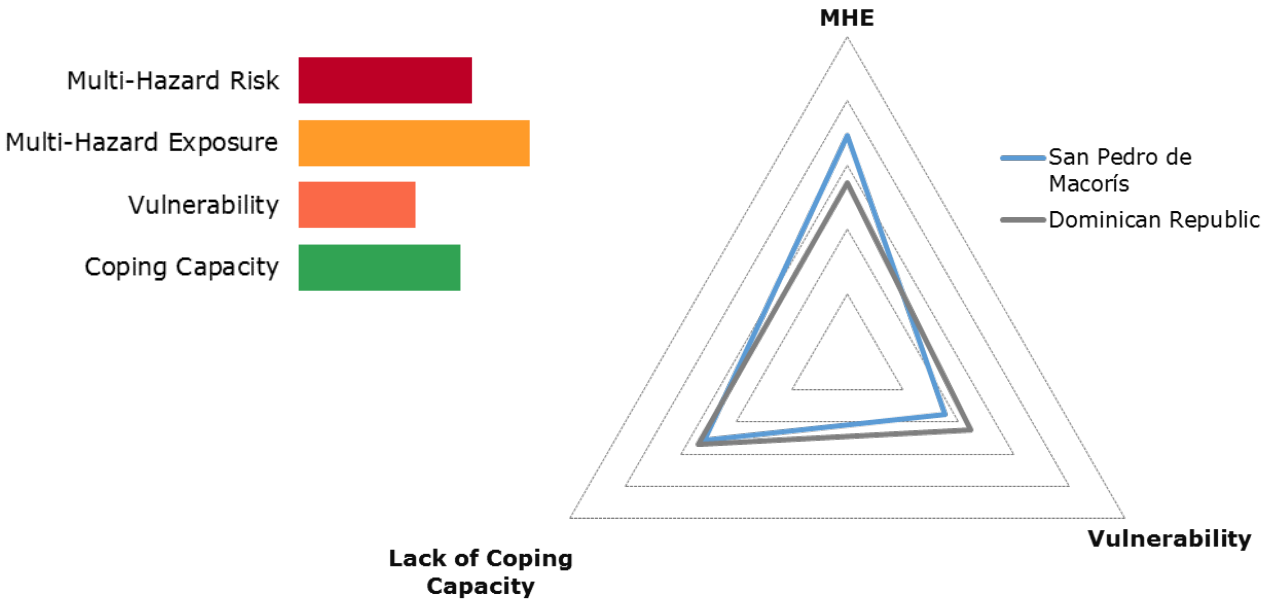


Figure 56. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[190] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[191] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High information access
High information access indicates that the population has an increased ability to access and comprehend disaster-related information before, during, and after events.

Low population pressures
Ranked 30 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

High overall infrastructure capacity
Ranked 5 of 32 provinces, well developed infrastructure – communication, health care, transportation - facilitates the exchange of information, and physical distribution of goods and services to the population.

Recommendations

01

Increase economic capacity
Encourage business development and education programs to increase economic opportunities in the region.

02

Increase environmental programs
Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

02

Increase government water services
Investments in public water and sewer facilities will help to decrease vulnerability and increase access to clean water during a disaster.

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Sánchez Ramírez

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Sánchez Ramírez

Province Capital: Cotuí

Area: 1,334 km^2

Sánchez Ramírez is located in the center of the country, in the sub-region of the Cibao Central. It is known for its caverns, mining and the production of rice and citrus.

152,027 Population (2017)

44.7% Population in Poverty

14.3% Illiterate Population

16.2 Infant Mortality Rate

74.3% Access to Improved Water

Municipality	Population
Cotuí	6,337
Cevicos	13,818
Fantino	22,210
La Mata	39,124

Multi-Hazard Risk Rank: High (13 of 32)

Lack of Resilience Rank: Medium (16 of 32)

RVA Component Scores

Table 147. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		Medium		High		Medium		Low	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.530	13	0.501	16	0.588	14	0.403	19	0.401	26

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[192] Rank: 14 of 32 Provinces (Score: 0.588)

Table 148. Estimated ambient population[193] exposed to each hazard

Cyclone

100%

182,229 People

Earthquake

100%

182,229 People

Landslide

52%

93,950 People

Flood

47%

86,490 People

Tsunami

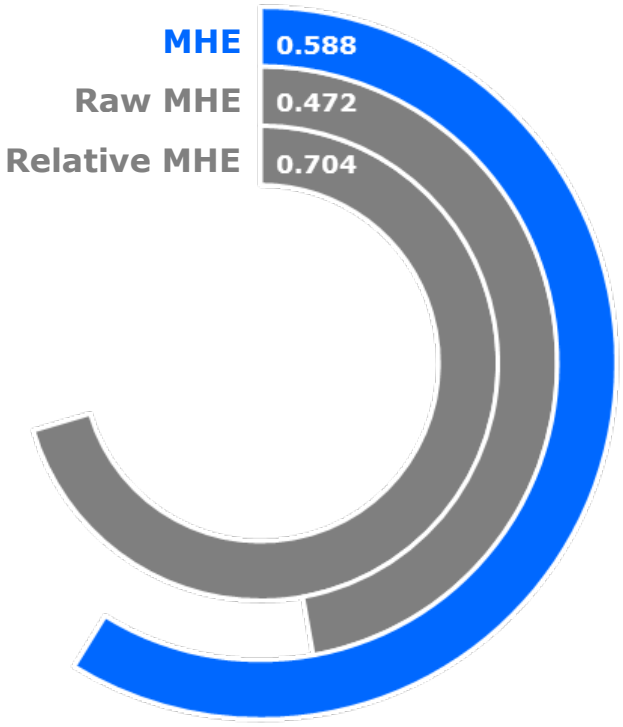
0%

0 People

Case Study: Mining Impacts in Sánchez Ramírez

The Pueblo Viejo gold mines are located within the Province of Sánchez Ramírez "in a world-class mineral reserve with one of the largest untapped gold deposits in the world." Rural communities near the mines experience direct impacts from the mining, including polluted rivers and dust clouds which expose the local population to a variety of health concerns. Chemicals used in the mining have brought on significant environmental degradation, including the loss of agriculture and wildlife.

"Mining Contamination Threatens Lives in Cotuí" – https://www.diccionariomedioambiente.org/DiccionarioMedioAmbiente_en/en/noticiaVer.asp?id=1652, 24 September 2014



[192] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[193] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[194] Rank: 19 of 32 Provinces (Score: 0.403) Vulnerability in Sánchez Ramírez is strongly influenced by a high **Gender Inequality**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

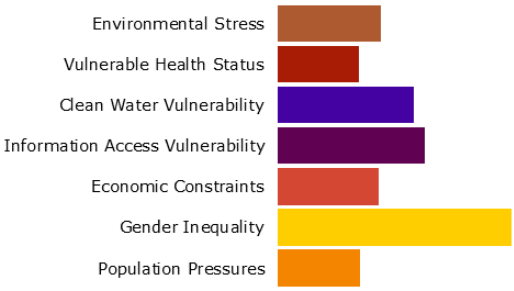


Table 149. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0%** Province Susceptible to Drought	**-3.8%** Average Annual Forest Change					
Vulnerable Health Status	**16.2** Infant Mortality Rate	**121.7** Maternal Mortality Rate	**7.4** Chronic Malnutrition	**5.6%** Population Disabled			
Clean Water Vulnerability	**25.7%** Households without Access to Improved Water	**8.9%** Households without Access to Flush Toilets					
Information Access Vulnerability	**14.3%** Illiteracy	**82.6%** Primary School Enrollment	**94.0%** Households without Internet	**21.8%** Households without TV	**52.0%** Households without Radio	**6.5** Average years of Schooling	
Economic Constraints	**55.9** Economic Dependency Ratio	**44.7%** Population in Poverty	**36.0%** CEP Beneficiaries				
Gender Inequality	**32.1%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.52** Female to Male Labor Ratio				
Population Pressures	**0.01%** Average Annual Population Change	**2.9%** Average Annual Urban Population Change					

[194] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[195] Rank: 26 of 32 Provinces (Score: 0.401) The thematic areas with the weakest relative scores are **Environmental Capacity, Transportation Infrastructure,** and **Economic Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

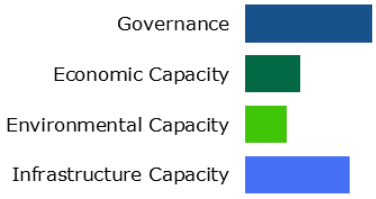


Table 150. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.01** Debt to Service Ratio	**90.2%** Employment Rate (Male)	**RD$ 19,436** Average Annual Income per Capita			
Governance	**79.3%** Registered Voter Participation (2016 Election)	**16.4** Homicide Rate per 100k persons	**55.6%** Households with Garbage Collection			
Environmental Capacity	**12.6%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**11.2** Hospital Beds per 10,000 Persons	**23.9** Nurses per 10,000 Persons	**17.8** Physicians per 10,000 Persons	**2.8 km** Average Distance to Nearest Hospital	**0.44** Vaccination Index[196]	
Communications Capacity	**13.4%** Households with Access to Fixed Phone Line	**76.0%** Households with Access to Mobile Phone				
Transportation Capacity	**44.0 km** Average Distance to Nearest Port or Airport	**0.55 km** Total Length of Road per km^2 (area)				

[195] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[196] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[197] Rank: 16 of 32 Provinces (Score: 0.501)

Sánchez Ramírez's score and ranking are due to moderate Vulnerability combined with very low Coping Capacity scores. Sánchez Ramírez ranks 19th in Vulnerability and 26th in Coping Capacity.

Table 151. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity

Economic Capacity

Gender Inequality

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[198] Rank: 13 of 32 Provinces (Score: 0.530)

Sánchez Ramírez's score and ranking are due to moderate Multi-Hazard Exposure combined with moderate Vulnerability and very low Coping Capacity.

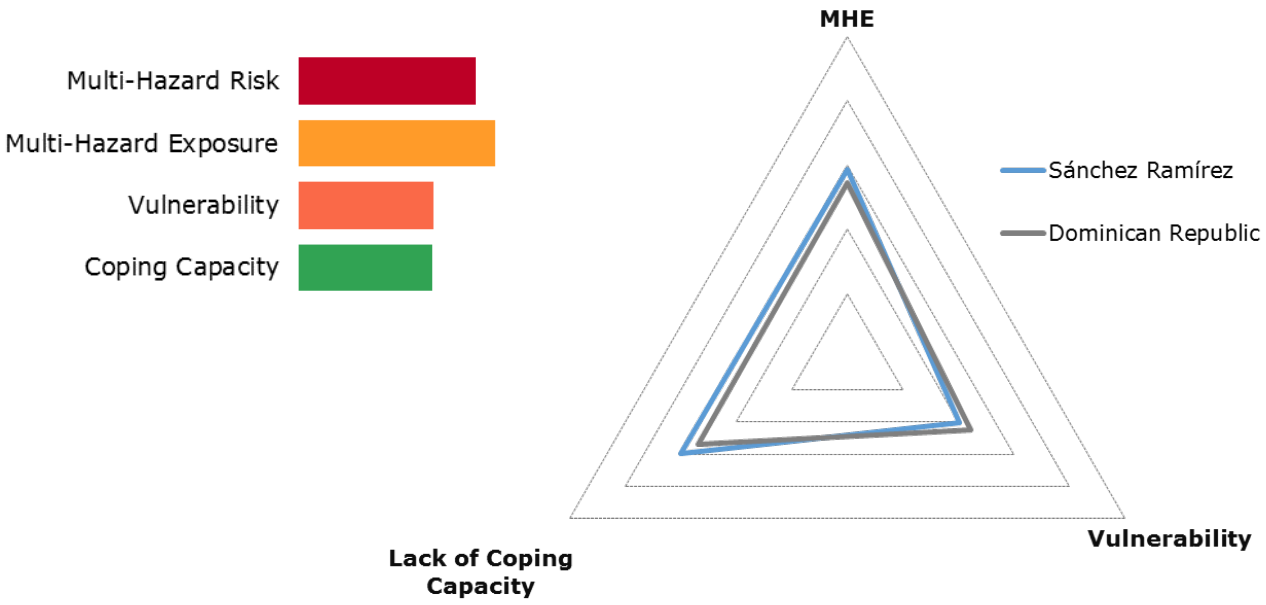


Figure 57. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[197] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[198] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Low vulnerable health status

Ranked 28 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Low population pressures

Ranked 27 of 32 provinces, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Recommendations

01

Increase economic capacity

Encourage business development and education programs to increase economic opportunities in the region.

02

Provide opportunities for women

Public education and awareness programs that focus on increasing the role of women in the workplace and the society will improve resilience and decrease vulnerability.

03

Increase environmental programs

Invest in programs to provide protection for the environment, including protected lands and reforestation projects, to increase the ability of the environment to recover after a disaster.

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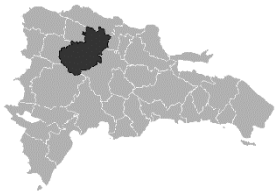
Santiago

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Santiago

Province Capital: Santiago de los Caballeros



Area: 3,167 km^2

Located in the north of the country, Santiago is the second most populated province in Dominican Republic. Santiago is an important political and financial center which includes the production of rum, textiles, tobacco, leather goods and furniture.

1,022,916 Population (2017)

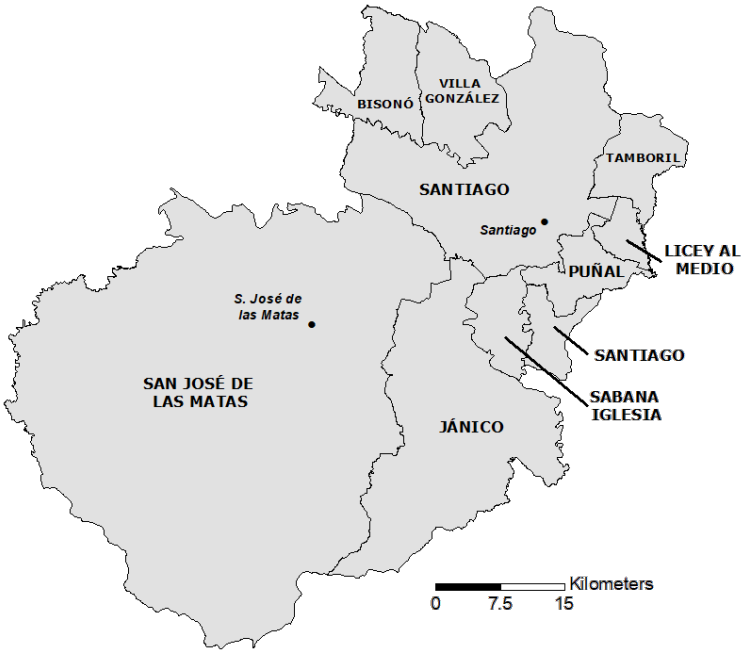
31.6% Population in Poverty

11.8% Illiterate Population

24.3 Infant Mortality Rate

95.2% Access to Improved Water

Municipality	Population
Santiago	734,026
Villa Bisonó	44,687
Jánico	18,028
Licey Al Medio	27,113
San José De Las Matas	40,986
Tamboril	54,879
Villa González	39,649
Puñal	49,381
Sabana Iglesia	14,167



Multi-Hazard Risk Rank: High (14 of 32)

Lack of Resilience Rank: Very Low (31 of 32)

RVA Component Scores

Table 152. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		Very Low		Very High		Very Low		Very High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.528	14	0.327	31	0.930	1	0.261	31	0.606	2

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[199] Rank: 1 of 32 Provinces (Score: 0.930)

Table 153. Estimated ambient population[200] exposed to each hazard

Cyclone

100%

1,095,394 People

Earthquake

100%

1,095,394 People

Landslide

80%

873,076 People

Flood

66%

728,380 People

Tsunami

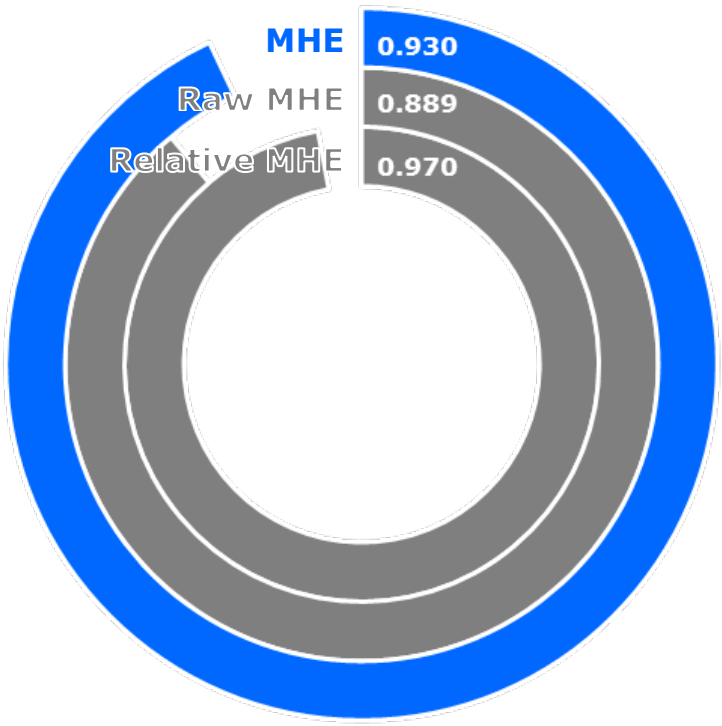
0%

0 People

Case Study: Community-Based Mapping in Santiago

Santiago is exposed to a multitude of risks, and the Dominican Red Cross has worked to provide effective risk solutions to the province through a community-based mapping approach. By encouraging communities to engage in their own hazard and capacities identification, the Dominican Red Cross has been able to successfully develop detailed maps for the purposes of risk management across the province. These maps have been shared with relevant stakeholders in Santiago, encouraging partner collaboration through a shared understanding of community vulnerabilities.

"Community Learning on Disaster Risk Management in Dominican Republic" – DIPECHO, March 2011



[199] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[200] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[201] Rank: 31 of 32 Provinces (Score: 0.261)
Vulnerability in Santiago is strongly influenced by moderate **Population Pressures** and **Gender Inequality**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

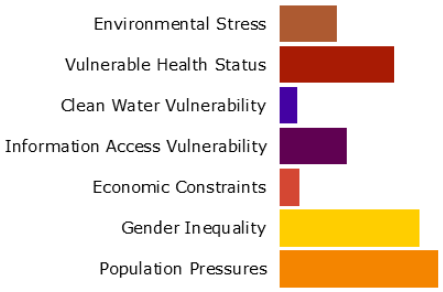


Table 154. Component Scores for each Vulnerability Sub-component

Environmental Stress	**3.1%** Province Susceptible to Drought	**0.9%** Average Annual Forest Change					
Vulnerable Health Status	**24.3** Infant Mortality Rate	**102.7** Maternal Mortality Rate	**8.2** Chronic Malnutrition	**5.5%** Population Disabled			
Clean Water Vulnerability	**4.8%** Households without Access to Improved Water	**2.5%** Households without Access to Flush Toilets					
Information Access Vulnerability	**11.8%** Illiteracy	**87.2%** Primary School Enrollment	**83.0%** Households without Internet	**16.1%** Households without TV	**43.0%** Households without Radio	**7.0** Average years of Schooling	
Economic Constraints	**50.0** Economic Dependency Ratio	**31.6%** Population in Poverty	**23.9%** CEP Beneficiaries				
Gender Inequality	**37.5%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.43** Female to Male Labor Ratio				
Population Pressures	**0.83%** Average Annual Population Change	**2.6%** Average Annual Urban Population Change					

[201] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[202] Rank: 2 of 32 Provinces (Score: 0.606) Santiago exhibits weakness in the thematic areas of **Governance** and **Health Care Capacity**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

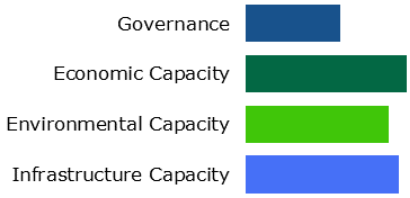


Table 155. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**1.00** Debt to Service Ratio	**94.1%** Employment Rate (Male)	**RD$ 33,371** Average Annual Income per Capita			
Governance	**64.9%** Registered Voter Participation (2016 Election)	**20.3** Homicide Rate per 100k persons	**82.6%** Households with Garbage Collection			
Environmental Capacity	**43.5%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**10.2** Hospital Beds per 10,000 Persons	**14.2** Nurses per 10,000 Persons	**16.5** Physicians per 10,000 Persons	**3.8 km** Average Distance to Nearest Hospital	**0.69** Vaccination Index[203]	
Communications Capacity	**30.1%** Households with Access to Fixed Phone Line	**81.8%** Households with Access to Mobile Phone				
Transportation Capacity	**29.8 km** Average Distance to Nearest Port or Airport	**2.11 km** Total Length of Road per km^2 (area)				

[202] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[203] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[204] Rank: 31 of 32 Provinces (Score: 0.327)

Santiago's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Santiago ranks 31st in Vulnerability and 2nd in Coping Capacity.

Table 156. The 3 Thematic areas with the Weakest Relative Scores

Health Care Infrastructure Capacity

Governance

Population Pressures

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[205] Rank: 14 of 32 Provinces (Score: 0.528)

Santiago's score and ranking are due to very high Multi-Hazard Exposure combined with very low Vulnerability and very high Coping Capacity.

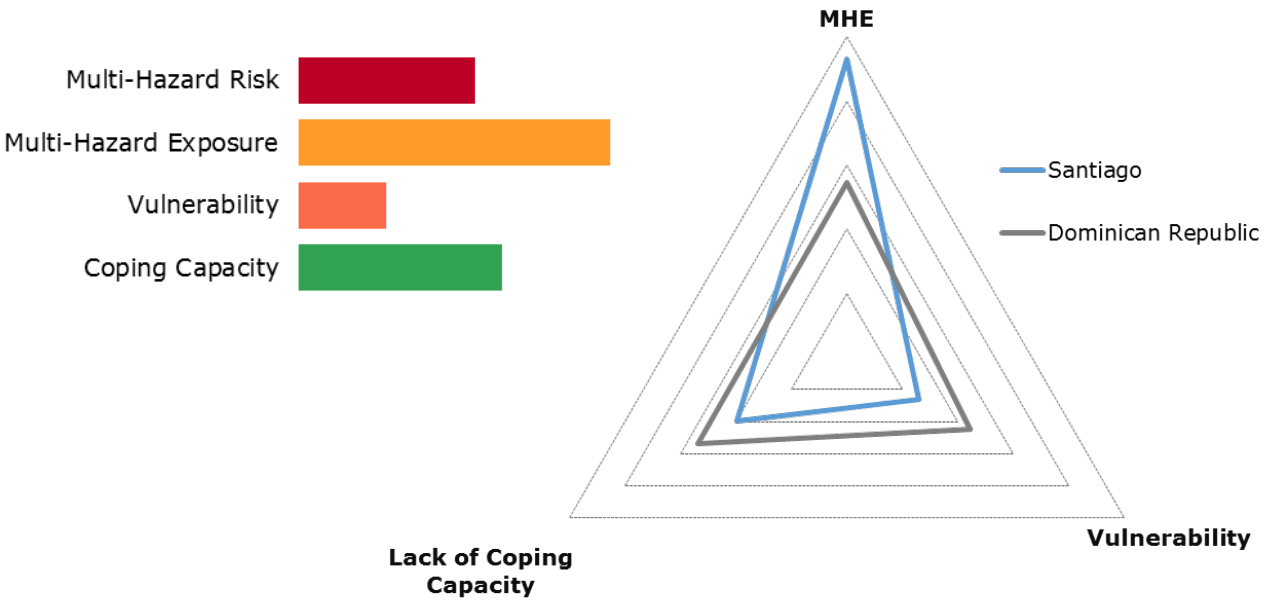


Figure 58. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[204] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[205] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

Lowest economic constraints

Ranked 32 of 32 provinces, low economic constraints indicate an increased ability to invest in mitigation and preparedness measures at the individual, household, and provincial level.

High overall coping capacity

Ranking 2 of 32 provinces, high coping capacity indicates the province's ability, using existing skills and resources, to face and manage adverse conditions, emergencies, or disasters.

Recommendations

01

Increase health care availability

Increase clinics and medical personnel through incentivized programs and investments to increase the health resilience of the population.

02

Improve governance

Provide additional support for local police, firefighters, and emergency medical resources to improve public safety and reduce crime rates. In addition, seek partnerships with the private sector to increase the provision of services, such as garbage collection.

03

Reduce population pressure

Rapid population changes are difficult to plan for, and can destabilize social, economic, and environmental systems. Analyze trends in the province to determine potential population changes and increase the update frequency of plans and SOPS to accommodate the changes.

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Santiago Rodríguez

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Santiago Rodríguez

Province Capital: San Ignacio de Sabaneta

Area: 1,295 km^2

Located in the northwest of the country in the Cibao sub-region, Santiago Rodríguez is an important center of commerce in the region including manufacturing and agriculture.

57,390
Population
(2017)

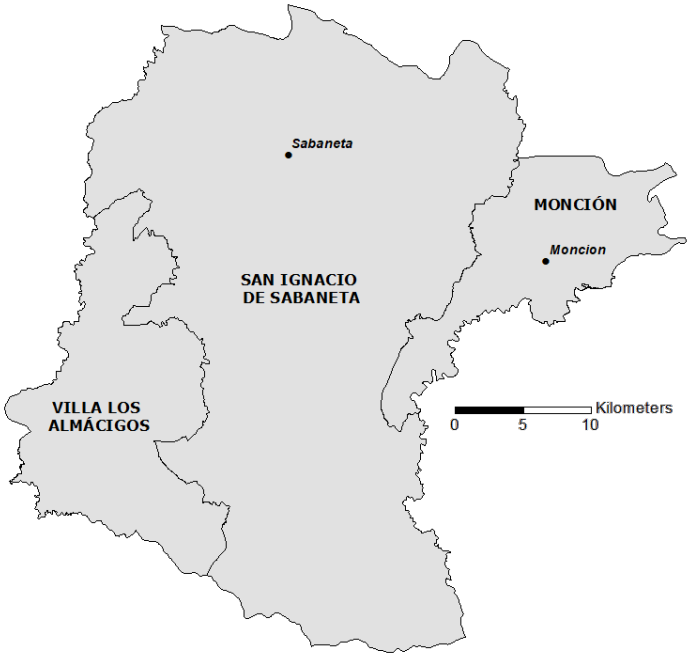
48.2%
Population in Poverty

19.1%
Illiterate Population

15.4
Infant Mortality Rate

84.5%
Access to Improved Water

Municipality	Population
San Ignacio De Sabaneta	34,490
Los Almácigos	11,167
Monción	11,733



Multi-Hazard Risk Rank: Very Low (31 of 32)

Lack of Resilience Rank: Low (24 of 32)

RVA Component Scores

Table 157. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Very Low		Low		Very Low		Low		High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.411	31	0.439	24	0.355	28	0.353	25	0.475	13

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[206] Rank: 28 of 32 Provinces (Score: 0.355)

Table 158. Estimated ambient population[207] exposed to each hazard

Cyclone

100%

72,132 People

Earthquake

100%

72,132 People

Landslide

55%

39,828 People

Flood

2%

1,690 People

Tsunami

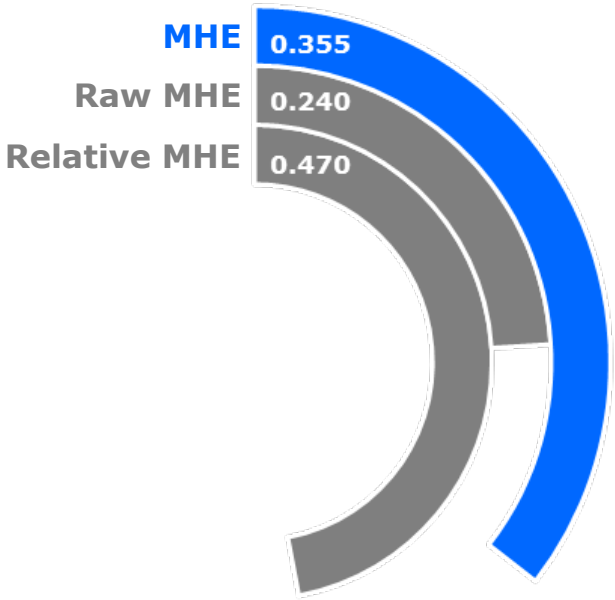
0%

0 People

Case Study: Bananas, Climate, and Deforestation

Santiago Rodríguez falls within the Yaque del Norte River basin and is an important location for the country's banana production. However, this production has been negatively affected in recent years "by the destruction of the forest layer in the upper part of the Yaque del Norte basin, and by the erosion of soils that lost their water retention capacity and the sedimentation of the river bed…" Environmental degradation, alongside substantial drought concerns, are proving to be of significant concern for one of the country's primary exports and, in extension, for the country's economy.

"Dominican Republic: Deforestation and Climate Affect Banana Exports" – https://www.freshplaza.com/article/2199779/dominican-republic-deforestation-and-climate-affect-banana-exports/, 21 August 2018



[206] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[207] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[208] Rank: 25 of 32 Provinces (Score: 0.353) Vulnerability in Santiago Rodríguez is moderately influenced by **Gender Inequality, Information Access Vulnerability,** and **Economic Constraints**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

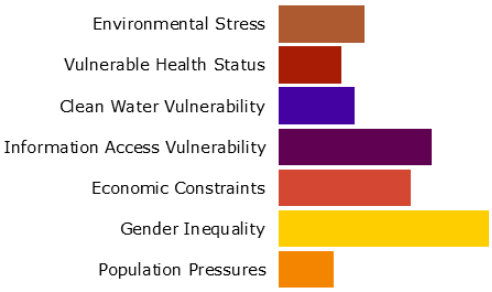


Table 159. Component Scores for each Vulnerability Sub-component

Environmental Stress	**16.6%** Province Susceptible to Drought	**0.3%** Average Annual Forest Change					
Vulnerable Health Status	**15.4** Infant Mortality Rate	**110.0** Maternal Mortality Rate	**7.5** Chronic Malnutrition	**4.6%** Population Disabled			
Clean Water Vulnerability	**15.5%** Households without Access to Improved Water	**5.4%** Households without Access to Flush Toilets					
Information Access Vulnerability	**19.1%** Illiteracy	**83.9%** Primary School Enrollment	**92.2%** Households without Internet	**29.2%** Households without TV	**47.3%** Households without Radio	**6.1** Average years of Schooling	
Economic Constraints	**58.0** Economic Dependency Ratio	**48.2%** Population in Poverty	**41.9%** CEP Beneficiaries				
Gender Inequality	**35.7%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.56** Female to Male Labor Ratio				
Population Pressures	**0.07%** Average Annual Population Change	**0.8%** Average Annual Urban Population Change					

[208] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[209] Rank: 13 of 32 Provinces (Score: 0.475) The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure (Transportation)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

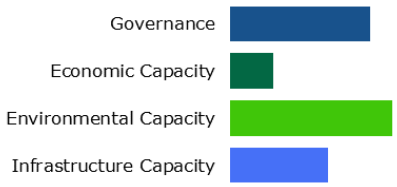


Table 160. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.98** Debt to Service Ratio	**90.2%** Employment Rate (Male)	**RD$ 15,118** Average Annual Income per Capita			
Governance	**76.6%** Registered Voter Participation (2016 Election)	**10.4** Homicide Rate per 100k persons	**58.7%** Households with Garbage Collection			
Environmental Capacity	**52.6%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**23.1** Hospital Beds per 10,000 Persons	**28.5** Nurses per 10,000 Persons	**16.7** Physicians per 10,000 Persons	**3.8 km** Average Distance to Nearest Hospital	**0.70** Vaccination Index[210]	
Communications Capacity	**14.0%** Households with Access to Fixed Phone Line	**73.2%** Households with Access to Mobile Phone				
Transportation Capacity	**53.9 km** Average Distance to Nearest Port or Airport	**0.47 km** Total Length of Road per km^2 (area)				

[209] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[210] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[211] Rank: 14 of 32 Provinces (Score: 0.439)

Santiago Rodríguez's score and ranking are due to low Vulnerability combined with moderate Coping Capacity scores. Santiago Rodríguez ranks 25th in Vulnerability and 13th in Coping Capacity.

Table 161. The 3 Thematic areas with the Weakest Relative Scores

Economic Capacity	**Transportation Infrastructure Capacity**	**Gender Inequality**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[212] Rank: 31 of 32 Provinces (Score: 0.411)

Santiago Rodríguez's score and ranking are due to very low Multi-Hazard Exposure combined with low Vulnerability and moderate Coping Capacity.

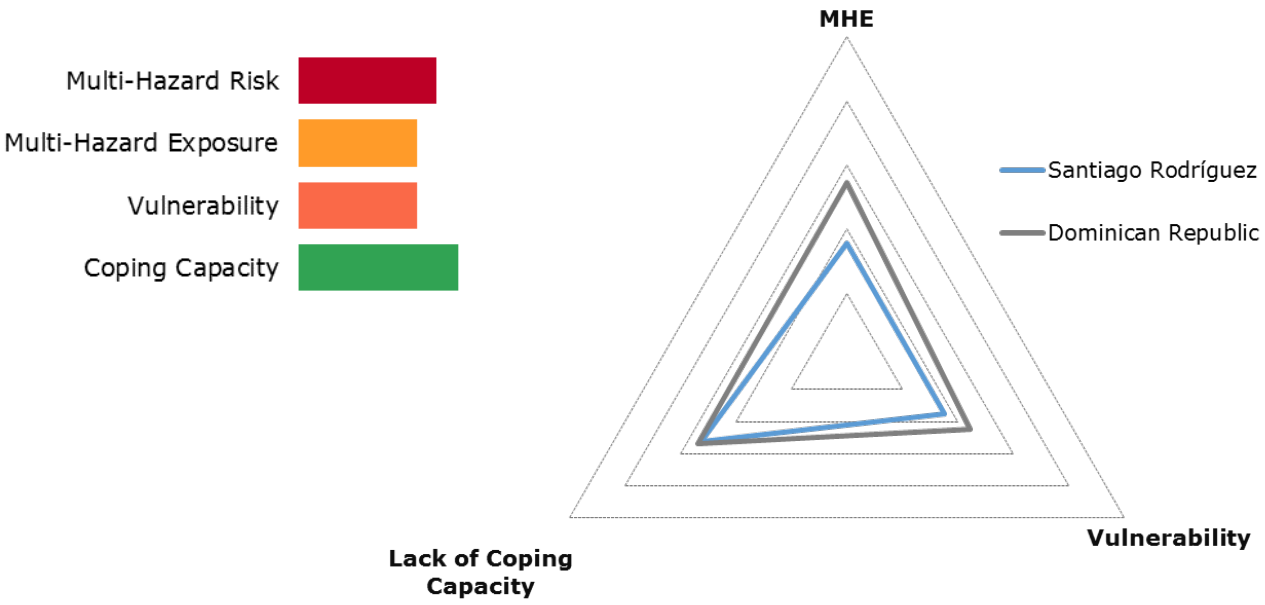


Figure 59. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[211] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[212] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High overall governance
Ranked 3 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

Low vulnerable health status
Ranked 29 of 32 provinces, low health vulnerability could indicate a population that will be more resilient to the negative health impacts associated with major disaster events.

Lowest population pressures
Ranked 32 of 32 departments, limited population change allows disaster managers to form accurate evacuation, sheltering, and resource plans.

Recommendations

01

Increase business development
Invest in business development and education programs to boost economic capacity and increase the number of businesses and the likelihood of success of those businesses.

02

Provide opportunities for women
Public education and awareness programs, as well as increased business and political opportunities that focus on advancing the role of women in the workplace and the society, will improve resilience and decrease vulnerability.

03

Invest in transportation infrastructure
Investing in transportation infrastructure will facilitate the distribution of goods and services before, during, and after a disaster event.

Better solutions.
Fewer disasters.
Safer world.

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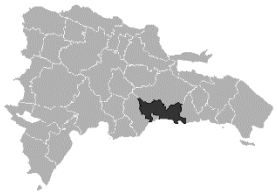
Santo Domingo

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Santo Domingo

Province Capital: Santo Domingo



Area: 1,457 km^2

Located in the south of the country, Santo Domingo is the industrial, commercial and financial center of the country. It's city, of the same name, is the oldest and most populous in The Caribbean.

2,753,219 Population (2017)

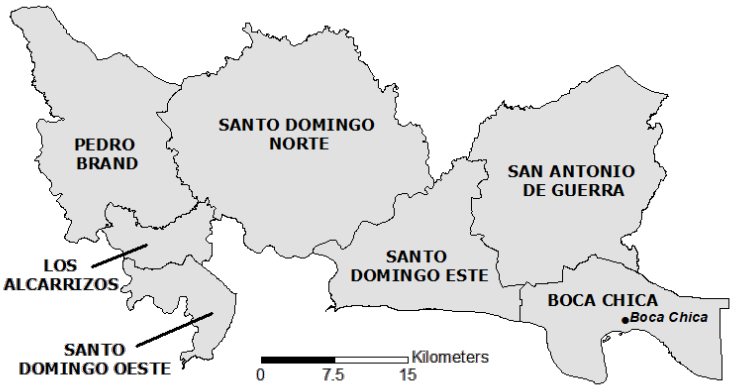
34.6% Population in Poverty

8.7% Illiterate Population

19.9 Infant Mortality Rate

89% Access to Improved Water

Municipality	Population
Santo Domingo Este	1,100,336
Santo Domingo Oeste	421,299
Santo Domingo Norte	613,833
Boca Chica	164,670
San Antonio De Guerra	50,972
Pedro Brand	85,825
Los Alcarrizos	316,284



Multi-Hazard Risk Rank: High (8 of 32)

Lack of Resilience Rank: Very Low (29 of 32)

RVA Component Scores

Table 162. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		Very Low		Very High		Very Low		Very High	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.538	8	0.392	29	0.829	2	0.328	28	0.544	6

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[213] Rank: 2 of 32 Provinces (Score: 0.829)

Table 163. Estimated ambient population[214] exposed to each hazard

Cyclone

100%

2,188,077 People

Earthquake

95%

2,087,669 People

Landslide

79%

1,725,564 People

Flood

6%

134,252 People

Tsunami

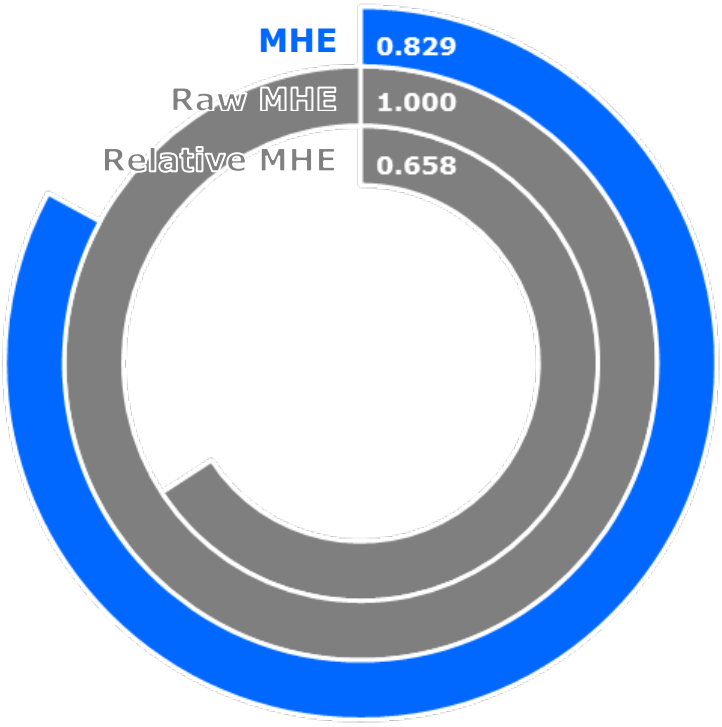
11%

229,768 People

Case Study: Post-Storm Recovery in the DR

In October 2007, the Dominican Republic was struck by Tropical Storm Noel and, five weeks later, by Tropical Storm Olga. Water infrastructure was severely damaged by these events, requiring the country to work with the United Nations to design and implement the *Emergency Recovery and Disaster Management Project* from 2008 to 2016. For the duration of the project, "over a million gallons of drinking water were provided to the population cut off from the regular water supply" in Santo Domingo as the country worked to restore the city's water treatment facilities.

"Contributing to Post-Storm Recovery in the Dominican Republic" – The World Bank, 19 October 2017



[213] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[214] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[215] Rank: 28 of 32 Provinces (Score: 0.328) Vulnerability in Santo Domingo is notably influenced by a high **Population Pressures**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

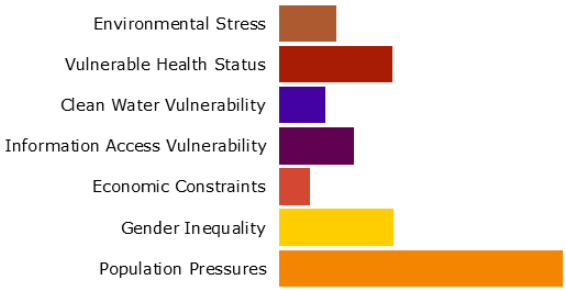


Table 164. Component Scores for each Vulnerability Sub-component

Environmental Stress	**0.03%** Province Susceptible to Drought	**0.5%** Average Annual Forest Change					
Vulnerable Health Status	**19.9** Infant Mortality Rate	**84.6** Maternal Mortality Rate	**8.7** Chronic Malnutrition	**7.2%** Population Disabled			
Clean Water Vulnerability	**11.0%** Households without Access to Improved Water	**3.5%** Households without Access to Flush Toilets					
Information Access Vulnerability	**8.7%** Illiteracy	**80.3%** Primary School Enrollment	**82.8%** Households without Internet	**15.3%** Households without TV	**46.9%** Households without Radio	**7.6** Average years of Schooling	
Economic Constraints	**53.7** Economic Dependency Ratio	**34.6%** Population in Poverty	**20.7%** CEP Beneficiaries				
Gender Inequality	**35.6%** Female Seats in Government	**1.1** Female to Male Years of Schooling	**0.36** Female to Male Labor Ratio				
Population Pressures	**2.18%** Average Annual Population Change	**8.6%** Average Annual Urban Population Change					

[215] **Vulnerability**: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[216] Rank: 6 of 32 Provinces (Score: 0.544) The thematic areas with the weakest relative scores are **Environmental Capacity, Health Care Capacity** and **Governance**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

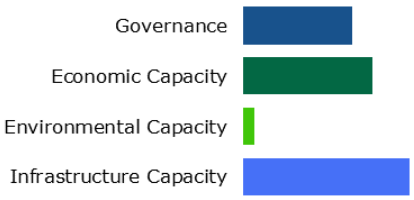


Table 165. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.91** Debt to Service Ratio	**92.7%** Employment Rate (Male)	**RD$ 25,555** Average Annual Income per Capita			
Governance	**65.4%** Registered Voter Participation (2016 Election)	**16.7** Homicide Rate per 100k persons	**80.0%** Households with Garbage Collection			
Environmental Capacity	**3.5%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**6.7** Hospital Beds per 10,000 Persons	**6.9** Nurses per 10,000 Persons	**9.3** Physicians per 10,000 Persons	**2.2 km** Average Distance to Nearest Hospital	**0.52** Vaccination Index[217]	
Communications Capacity	**34.0%** Households with Access to Fixed Phone Line	**83.6%** Households with Access to Mobile Phone				
Transportation Capacity	**9.7 km** Average Distance to Nearest Port or Airport	**2.76 km** Total Length of Road per km^2 (area)				

[216] Coping Capacity: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[217] Vaccination Coverage Index: Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[218] Rank: 29 of 32 Provinces (Score: 0.392)

Santo Domingo's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Santo Domingo ranks 28th in Vulnerability and 6th in Coping Capacity.

Table 166. The 3 Thematic areas with the Weakest Relative Scores

Environmental Capacity	**Population Pressures**	**Health Care Infrastructure Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[219] Rank: 8 of 32 Provinces (Score: 0.538)

Santo Domingo's score and ranking are due to very high Multi-Hazard Exposure combined with very low Vulnerability and very high Coping Capacity.

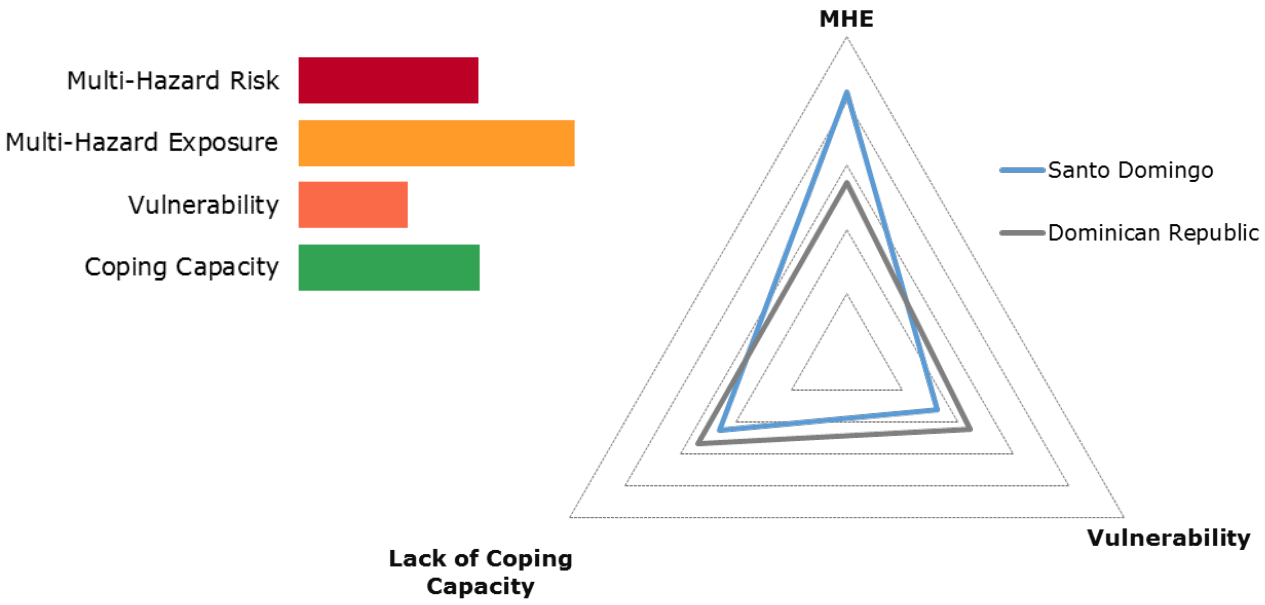


Figure 60. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[218] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[219] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High economic capacity
Ranked 6 of 32 provinces, high economic capacity indicates that Santo Domingo may be able to invest in additional mitigation and preparedness measures at the local and community level.

High overall infrastructure capacity
Ranked 2 of 32 provinces, well developed infrastructure – communication, health care, transportation - facilitates the exchange of information, and physical distribution of goods and services to the population.

High overall coping capacity
Ranking 6 of 32 provinces, high coping capacity indicates the province's ability, using existing skills and resources, to face and manage adverse conditions, emergencies, or disasters.

Recommendations

01

Improve environmental capacity
Invest in protected areas to reduce environmental stress and degradation.

02

Reduce population pressure
Rapid population changes are difficult to plan for, and can destabilize social, economic, and environmental systems. Analyze trends in the province to determine potential population changes and increase the update frequency of plans and SOPS to accommodate the changes.

03

Build health care capacity
Focus investments to increase access to health care and preventative medicine, as well as transportation to improve connectivity and ensure that health services can be reached by the entire population.

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Fewer disasters.
Safer world.

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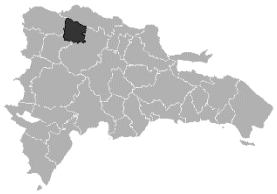
Valverde

Dominican Republic National Disaster Preparedness Baseline Assessment

Province Profile

Province: Valverde

Province Capital: Santa Cruz de Mao



Area: 931 km^2

Located in the Northwest Region, Valverde is known for rice production and milling, with a variety of other crops grown in the area as well. Livestock and mining also contribute to the economy.

173,011
Population
(2017)

55.1%
Population in Poverty

19.6%
Illiterate Population

18.4
Infant Mortality Rate

93.6%
Access to Improved Water

Municipality	Population
Mao	81,575
Esperanza	66,014
Laguna Salada	25,422

Multi-Hazard Risk Rank: High (10 of 32)

Lack of Resilience Rank: Medium (20 of 32)

RVA Component Scores

Table 167. Province Scores and Ranks (compared across Provinces) for each Index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
High		**Medium**		**High**		**High**		**Very High**	
Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)	Score	Rank (of 32)
0.536	10	0.463	20	0.682	12	0.482	12	0.556	4

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure[220] Rank: 12 of 32 Provinces (Score: 0.682)

Table 168. Estimated ambient population[221] exposed to each hazard

Cyclone

100%

190,513 People

Earthquake

100%

190,513 People

Landslide

54%

102,102 People

Flood

74%

140,136 People

Tsunami

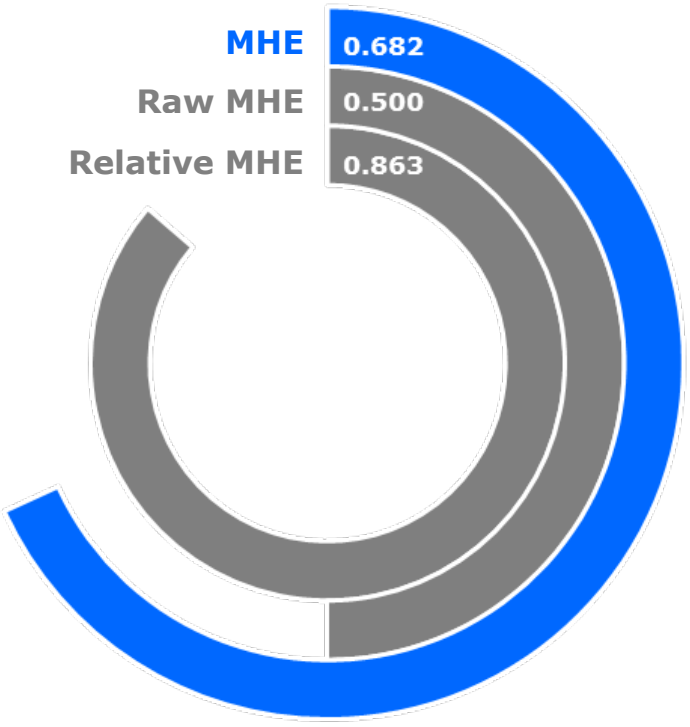
0%

0 People

Case Study: Fighting HIV in Valverde

In collaboration with USAID, the province of Valverde has worked to control the HIV epidemic among its communities through the PEPFAR program. PEPFAR "seeks to increase the availability of testing, improve linkages and retention of persons living with HIV into care and treatment services, achieve viral suppression, and reduce the number of newly HIV-infected individuals." With a population at high risk of HIV infection, Valverde seeks to strengthen its capacity to manage this significant health risk by increasing community awareness and resilience.

"AIDS-Free Generation" – USAID, 1 August 2017



[220] **Multi-Hazard Exposure**: Average exposure of the population to hazards.

[221] **Ambient Population**: 24-hour average estimate of the population in each province. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability[222] Rank: 12 of 32 Provinces (Score: 0.482) Vulnerability in Valverde is influenced by **Gender Inequality, Environmental Stress,** and **Vulnerable Health Status**. The bar chart on the right indicates the socioeconomic themes contributing to the Province's overall Vulnerability score.

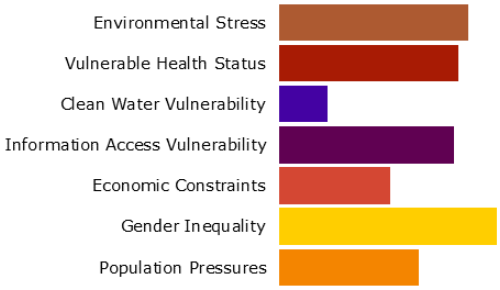


Table 169. Component Scores for each Vulnerability Sub-component

Environmental Stress	**81.4%** Province Susceptible to Drought	**0.2%** Average Annual Forest Change					
Vulnerable Health Status	**18.4** Infant Mortality Rate	**150.6** Maternal Mortality Rate	**10.7** Chronic Malnutrition	**10.5%** Population Disabled			
Clean Water Vulnerability	**6.4%** Households without Access to Improved Water	**6.3%** Households without Access to Flush Toilets					
Information Access Vulnerability	**19.6%** Illiteracy	**80.4%** Primary School Enrollment	**92.9%** Households without Internet	**27.6%** Households without TV	**53.5%** Households without Radio	**6.0** Average years of Schooling	
Economic Constraints	**55.0** Economic Dependency Ratio	**55.1%** Population in Poverty	**34.2%** CEP Beneficiaries				
Gender Inequality	**37.7%** Female Seats in Government	**1.2** Female to Male Years of Schooling	**0.52** Female to Male Labor Ratio				
Population Pressures	**0.82%** Average Annual Population Change	**1.6%** Average Annual Urban Population Change					

[222] Vulnerability: The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity[223] Rank: 4 of 32 Provinces (Score: 0.556) The thematic areas with the weakest relative scores are **Environmental Capacity** and **Infrastructure (Health Care)**. The bar chart on the right indicates the socioeconomic themes contributing to the province's overall Coping Capacity score.

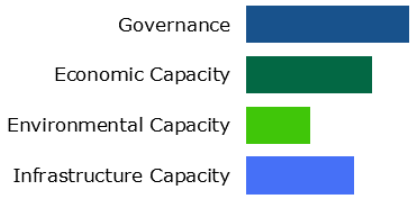


Table 170. Component Scores for each Coping Capacity Sub-component

Economic Capacity	**0.96** Debt to Service Ratio	**94.4%** Employment Rate (Male)	**RD$ 19,937** Average Annual Income per Capita			
Governance	**74.9%** Registered Voter Participation (2016 Election)	**14.2** Homicide Rate per 100k persons	**84.2%** Households with Garbage Collection			
Environmental Capacity	**19.4%** Protected or Reforested Land					
Infrastructure Capacity						
Health Care Capacity	**9.3** Hospital Beds per 10,000 Persons	**12.1** Nurses per 10,000 Persons	**12.9** Physicians per 10,000 Persons	**2.8 km** Average Distance to Nearest Hospital	**0.45** Vaccination Index[224]
Communications Capacity	**15.9%** Households with Access to Fixed Phone Line	**76.7%** Households with Access to Mobile Phone			
Transportation Capacity	**43.3 km** Average Distance to Nearest Port or Airport	**1.04 km** Total Length of Road per km^2 (area)			

[223] **Coping Capacity**: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

[224] **Vaccination Coverage Index:** Coverage of DPT (diphtheria, pertussis, and tetanus), Polio, Tuberculosis, and Measles vaccinations. Index values range from 0 to 1, with 1 indicating higher coverage.

Lack of Resilience (LR)

Lack of Resilience[225] Rank: 20 of 32 Provinces (Score: 0.463)

Valverde's score and ranking are due to high Vulnerability combined with very high Coping Capacity scores. Valverde has the highest Vulnerability and the 7th highest Coping Capacity.

Table 171. The 3 Thematic areas with the Weakest Relative Scores

Vulnerable Health Status	**Gender Inequality**	**Health Care Infrastructure Capacity**

Multi-Hazard Risk (MHR)

Multi-Hazard Risk[226] Rank: 10 of 32 Provinces (Score: 0.536)

Valverde's score and ranking are due to high Multi-Hazard Exposure combined with high Vulnerability and very high Coping Capacity.

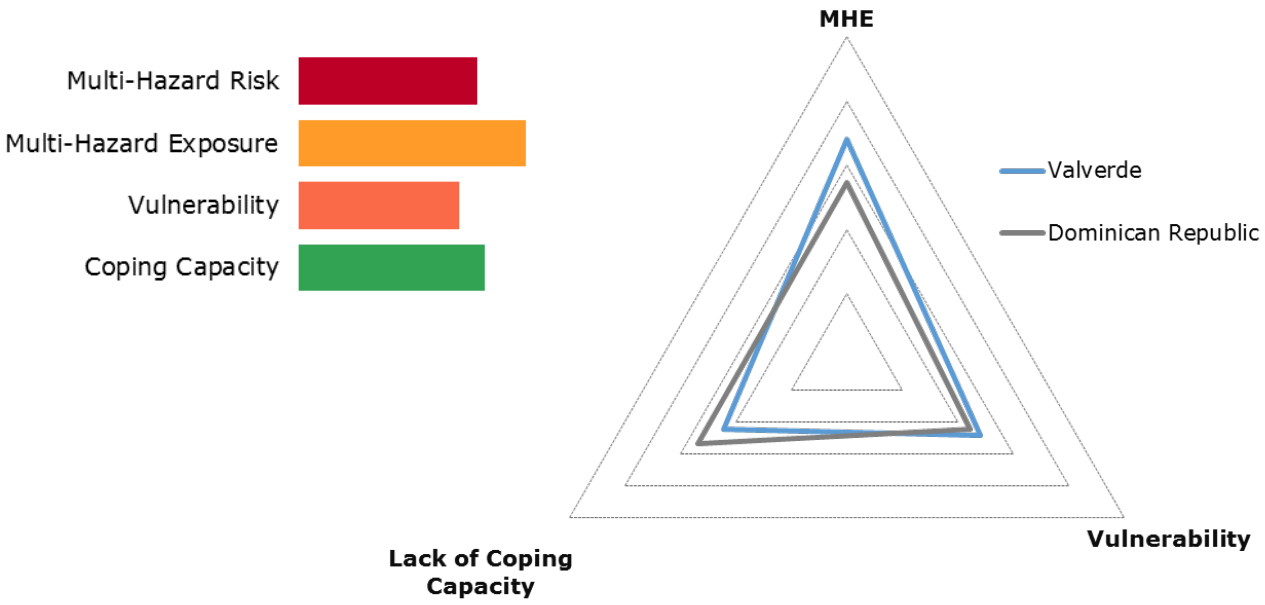


Figure 61. Province Multi-Hazard Risk Component Scores Compared to Overall Average Country Scores

[225] Lack of Resilience: The susceptibility to impact from the short-term inability to absorb, respond to, and recover from disruptions to a country's normal function. This index provides a hazard-independent look at current socio-economic conditions.

[226] Multi-Hazard Risk: The likelihood of losses or disruptions to a country's normal function due to interaction between multi-hazard exposure, socioeconomic vulnerability, and coping capacity.

Successes

High overall governance

Ranked 2 of 32 provinces, high governance could facilitate the implementation of disaster management initiatives into provincial and municipal communities.

High overall coping capacity

Ranking 4 of 32 provinces, high coping capacity indicates the province's ability, using existing skills and resources, to face and manage adverse conditions, emergencies, or disasters.

Recommendations

01

Reduce vulnerable health status

Invest in public welfare services to decrease malnutrition, support the disabled population, and decrease infant and maternal mortality.

02

Provide opportunities for women

Public education and awareness programs that focus on increasing the role of women in the workplace and the society will improve the resilience of women during disasters.

03

Increase health care availability

Increase clinics and medical personnel through incentivized programs and investments to increase the health resilience of the population.

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Appendices

National Disaster Preparedness Baseline Assessment
Final Report

Appendix A: RVA Component Index Hierarchies and Thematic Rationale

Multi-Hazard Exposure

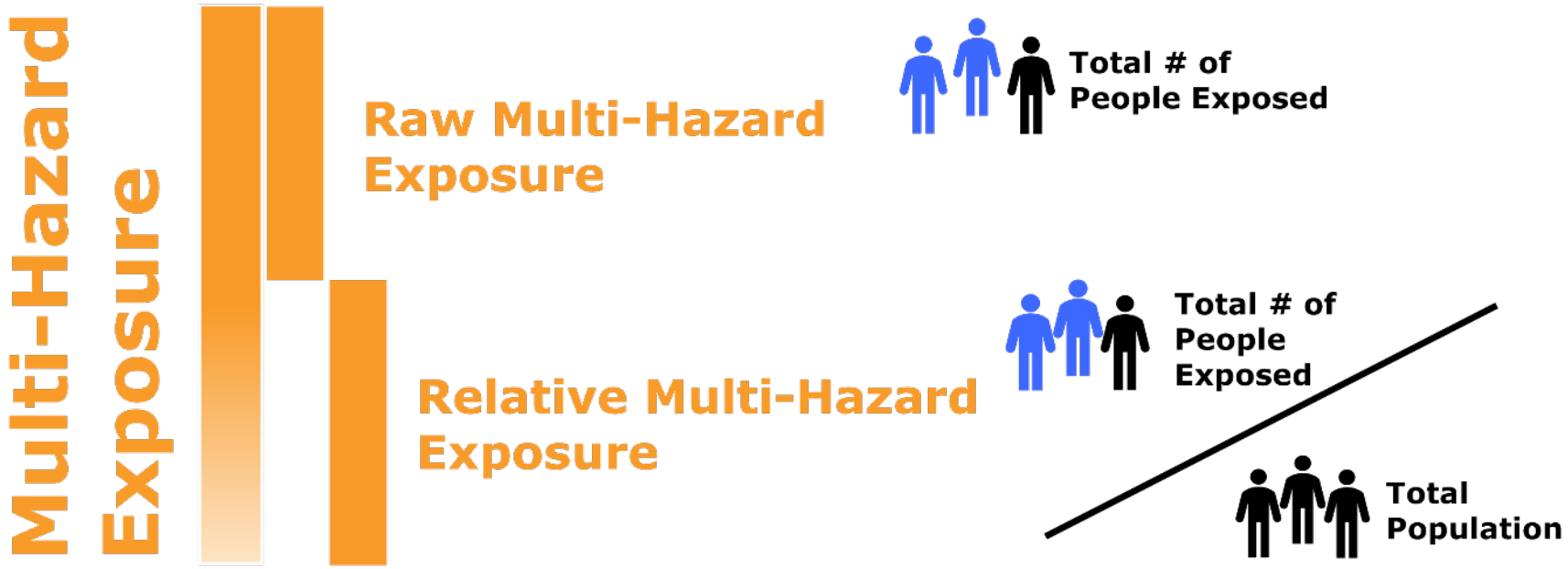


Figure 62. Multi-Hazard Exposure Index Hierarchy

Table 172. Multi-Hazard Exposure Scores and Ranks

Province	MHE Index		Raw MHE		Relative MHE	
	Score	Rank	Score	Rank	Score	Rank
Santiago	0.93	1	0.889	2	0.97	2
Santo Domingo	0.829	2	1	1	0.658	17
Puerto Plata	0.815	3	0.661	6	0.969	4
Duarte	0.792	4	0.636	7	0.948	5
Espaillat	0.779	5	0.588	9	0.969	3
Distrito Nacional	0.764	6	0.856	3	0.673	15
La Vega	0.725	7	0.683	4	0.768	9
Hermanas Mirabal	0.707	8	0.414	22	1	1
Monseñor Nouel	0.701	9	0.517	11	0.885	7
San Pedro de Macorís	0.691	10	0.627	8	0.756	10
María Trinidad Sánchez	0.691	11	0.472	17	0.909	6
Valverde	0.682	12	0.5	14	0.863	8
La Romana	0.608	13	0.548	10	0.668	16
Sánchez Ramírez	0.588	14	0.472	18	0.704	14

Province	MHE Index		Raw MHE		Relative MHE	
	Score	Rank	Score	Rank	Score	Rank
Monte Cristi	0.584	15	0.414	21	0.753	11
Monte Plata	0.569	16	0.5	15	0.639	18
La Altagracia	0.568	17	0.503	13	0.632	19
Samaná	0.54	18	0.366	23	0.714	13
Hato Mayor	0.539	19	0.357	24	0.72	12
San Cristóbal	0.478	20	0.681	5	0.276	27
Peravia	0.459	21	0.464	19	0.455	23
El Seibo	0.458	22	0.342	25	0.573	20
Barahona	0.393	23	0.454	20	0.331	26
Baoruco	0.382	24	0.328	26	0.435	24
San Juan	0.372	25	0.503	12	0.241	29
Azua	0.37	26	0.478	16	0.263	28
Independencia	0.356	27	0.226	29	0.487	21
Santiago Rodríguez	0.355	28	0.24	28	0.47	22
Dajabón	0.355	29	0.304	27	0.405	25

Province	MHE Index		Raw MHE		Relative MHE	
	Score	Rank	Score	Rank	Score	Rank
San José de ocoa	0.172	30	0.195	31	0.149	31
Pedernales	0.109	31	0	32	0.218	30
Elías Piña	0.105	32	0.21	30	0	32

Table 173. Multi-Hazard Exposure Metadata

Multi-Hazard Exposure					
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**	**Notes**
Raw Exposure	Raw Population Exposure	EIGEO-CNE (Tsunami Hazard Zones) EIGEO-CNE (Flood Zones) DGODT/MEPyD/BID (Earthquake) PDC (Landslide) Munich Reinsurance Company (Munich Re) (Tropical Cyclone) ORNL Landscan (population)	2014 (Population) 2012 (Earthquake) 2002 (Hurricane) 2010 (Flood) 2010 (Tsunami) 2016 (Landslide)	Raw count of persons exposed to multiple hazards, including floods, tsunami, earthquake, landslide, and tropical cyclone.	***Flood:*** *Flood prone areas.* ***Tsunami:*** *Tsunami prone areas.* ***Landslide:*** *Medium to Very High Susceptibility* ***Earthquake:*** *Areas with MMI VII and above were based on 1.0 second spectral acceleration at a 2500 year return period. Data was digitized from the BID study (Amenazas y Riesgos Naturales Republica Dominicana, Compendio de Mapas) 2012* ***Tropical Cyclone:*** *Cat 1+* 1. Identify hazard exposure zones 2. Intersect with Landscan (2014) 3. Sum Exposed Pop by province 4. Sum Exposed province Pop for Mult Hazards (persons) Exposed persons = [pop exposed to earthquake] + [pop exposed to flooding] + [pop exposed to tsunami] + [pop exposed to landslide] + [pop exposed to tropical cyclone]
Relative Exposure	Relative Population Exposure	EIGEO-CNE (Tsunami Hazard Zones) EIGEO-CNE (Flood Zones) DGODT/MEPyD/BID (Earthquake) PDC (Landslide) Munich Reinsurance Company (Munich Re) (Tropical Cyclone) ORNL Landscan (population)	2014 (Population) 2012 (Earthquake) 2002 (Hurricane) 2010 (Flood) 2010 (Tsunami) 2016 (Landslide)	Total count of person units exposed to multiple hazards, including floods, tsunami, earthquake, landslide, and tropical cyclone by province population.	[total person units exposed to multiple hazards (see above)] / [total population]

Vulnerability

Population Pressures

Average Annual Population Change

Average Annual Urban Population Change

Gender Inequality

Female to Male Labor Ratio

Female to Male Years of Schooling

Female Seats in Government

Access to Information

Adult Illiteracy Rate

Average Years of Schooling

Primary School Enrollment

Households without Internet, Television, Radio

Vulnerable Health Status

Infant Mortality Rate

Maternal Mortality Rate

Chronic Malnutrition

Disability

Economic Constraints

Economic Dependency Ratio

Poverty

CEP Beneficiaries

Access to Clean Water

Households Without Access to Improved Water

Households Without Access to Flush Toilets

Environmental Stress

Susceptibility to Drought

Average Annual Forest Change

Table 15. Vulnerability Index Hierarchy

Table 174. Vulnerability Scores and Ranks

Province	Vulnerability Index		Economic Constraints		Info Access Vuln.		Clean Water Vuln.		Vuln. Health Status		Gender Inequality		Population Pressures		Environ. Stress	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Baoruco	0.655	1	0.744	4	0.724	4	0.637	6	0.767	1	0.49	23	0.502	11	0.72	3
Independencia	0.635	2	0.791	3	0.825	3	0.467	10	0.465	11	0.588	15	0.609	5	0.7	4
Pedernales	0.631	3	0.811	2	0.949	1	0.715	4	0.345	23	0.422	27	0.649	4	0.523	10
Elías Piña	0.606	4	1	1	0.885	2	0.759	1	0.615	4	0.343	31	0.345	24	0.292	19
El Seibo	0.601	5	0.624	7	0.697	5	0.696	5	0.311	26	0.742	4	0.537	7	0.601	8
Azua	0.585	6	0.62	8	0.689	7	0.41	15	0.411	15	0.734	5	0.534	8	0.697	5
Monte Cristi	0.565	7	0.466	12	0.693	6	0.272	21	0.76	2	0.728	6	0.395	18	0.644	6
La Altagracia	0.542	8	0.22	24	0.526	13	0.579	7	0.171	32	0.562	17	1	1	0.739	2
San Juan	0.54	9	0.667	5	0.581	10	0.415	14	0.54	8	0.646	14	0.444	16	0.486	11
Monte Plata	0.497	10	0.612	9	0.582	9	0.724	3	0.426	14	0.521	20	0.356	22	0.258	24
Hato Mayor	0.496	11	0.532	10	0.451	20	0.749	2	0.61	5	0.675	11	0.18	31	0.275	22
Valverde	0.482	12	0.355	15	0.555	12	0.153	27	0.572	6	0.692	8	0.445	15	0.601	7
San José de ocoa	0.476	13	0.451	13	0.645	8	0.255	24	0.558	7	0.679	10	0.464	12	0.277	21
Peravia	0.473	14	0.281	23	0.488	17	0.279	20	0.435	13	0.712	7	0.572	6	0.546	9
Barahona	0.458	15	0.634	6	0.576	11	0.392	16	0.377	16	0.543	19	0.277	26	0.404	13
Samaná	0.446	16	0.337	16	0.525	14	0.486	9	0.197	30	0.517	21	0.693	3	0.363	14

Province	Vulnerability Index		Economic Constraints		Info Access Vuln.		Clean Water Vuln.		Vuln. Health Status		Gender Inequality		Population Pressures		Environ. Stress	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Dajabón	0.44	17	0.525	11	0.515	16	0.152	28	0.687	3	0.411	28	0.46	13	0.329	15
La Romana	0.412	18	0.291	20	0.347	27	0.185	26	0.353	21	0.375	29	0.52	9	0.813	1
Sánchez Ramírez	0.403	19	0.323	19	0.47	19	0.433	12	0.261	28	0.746	3	0.263	27	0.328	16
María Trinidad Sánchez	0.398	20	0.328	18	0.525	15	0.427	13	0.336	25	0.684	9	0.253	28	0.236	26
La Vega	0.398	21	0.189	26	0.412	21	0.377	18	0.467	10	0.777	2	0.312	25	0.252	25
Duarte	0.395	22	0.332	17	0.399	22	0.381	17	0.266	27	0.817	1	0.353	23	0.219	28
Hermanas Mirabal	0.392	23	0.285	22	0.383	24	0.545	8	0.487	9	0.578	16	0.234	29	0.23	27
Espaillat	0.356	24	0.161	27	0.394	23	0.33	19	0.351	22	0.56	18	0.411	17	0.288	20
Santiago Rodríguez	0.353	25	0.422	14	0.488	18	0.242	25	0.2	29	0.667	12	0.177	32	0.273	23
San Pedro de Macorís	0.351	26	0.287	21	0.311	29	0.442	11	0.367	18	0.426	25	0.185	30	0.439	12
San Cristóbal	0.338	27	0.214	25	0.378	26	0.256	23	0.342	24	0.425	26	0.452	14	0.297	18
Santo Domingo	0.328	28	0.097	30	0.238	30	0.149	29	0.361	20	0.366	30	0.902	2	0.182	31
Monseñor Nouel	0.32	29	0.108	29	0.317	28	0.137	30	0.458	12	0.648	13	0.364	21	0.209	29
Puerto Plata	0.311	30	0.136	28	0.38	25	0.27	22	0.18	31	0.501	22	0.391	19	0.319	17

Province	Vulnerability Index		Economic Constraints		Info Access Vuln.		Clean Water Vuln.		Vuln. Health Status		Gender Inequality		Population Pressures		Environ. Stress	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Santiago	0.261	31	0.064	32	0.212	31	0.056	31	0.364	19	0.445	24	0.502	10	0.182	30
Distrito Nacional	0.153	32	0.091	31	0.05	32	0	32	0.368	17	0.197	32	0.366	20	0	32

Table 175. Vulnerability Metadata

Vulnerability				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
Economic Constraints	Poverty	ONAPLAN, MEPyD - Atlas Nacional de la Pobreza en la República Dominicana 2010	2010	Percentage of the population living in poverty or extreme poverty.
	Economic Dependence Ratio	ONE - Estimaciones y Proyecciones Nacionales de Poblacion 1950-2100, 2014	2016	Ratio of dependents (people younger than 15 and older than 64) to the working-age population (those ages 15-64).
	CEP Beneficiaries	SIUBEN	2016	Comer es Primero (CEP) is a monthly financial aid of RD$ 825.00 that is provided to each beneficiary household in order to purchase food. Households must comply with certain conditions to receive assistance, including: a) pregnant women must attend medical checkups; b) children have to go to the doctor for checkups and vaccinations. Families must reapply and fill out a survey every year to continue to be included in the program. In order to qualify for other social programs families must first qualify for CEP.
Access to Information Vulnerability	Households without a Television	ONE - Population and Household Census	2010	Percentage of households that do not have access to a television.
	Households without Internet	ONE - Population and Household Census	2010	Percentage of households that do not have access to internet.

Vulnerability				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
	Households without Radio	ONE - Population and Household Census	2010	Percentage of households that do not have access to radio. Indicator includes music/radio.
	Illiteracy	ONE - Population and Household Census	2010	Percentage of the population 15 years and older that is illiterate.
	Student Enrollment	MINERD - Department of Statistics, 2014 ONE - Projected Population, 2014	2014	Percentage of the population aged 3-18 enrolled in school.
Access to Clean Water Vulnerability	Households without Sanitation Services Access	MSP - Data Source ONE - Population and Household Census	2010	Percentage of households without access to sanitation services. Note, unimproved sanitation facilities include public or shared latrine and open pit latrine bucket. Improved sanitation facilities are connected to the sewer, septic system, pour-flush latrines, simple pit latrines, and ventilated improved pit.
	Households without Improved Water Access	MSP - Data Source ONE - Population and Household Census	2010	Percentage of households without access to improved sources of water for domestic use.
Vulnerable Health Status	Maternal Mortality Ratio	MSP (Data Source) ONE (Live Birth Projections)	2014	Single-year ratio of maternal deaths per 100,000 live births. Note, no maternal deaths reported for Elias Pina and Pedernales in 2014, province values removed for index construction.
	Infant Mortality Rate	MSP (Data Source)	2014	Single-year infant mortality rate per 1,000 live births.

Vulnerability				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
		ONE (Live Birth Projections)		
	Chronic Malnutrition (<5)	MSP (Data Source) ONE (Population Projections)	2014	Percentage of chronic malnutrition for children under the age of 5.
	Disabled Population	ONE (Provider) ENHOGAR (Disability Data Source) ONE (Projected Population)	2013	Percentage of the population that is disabled.
Environmental Stress	Average Annual Forest Change	MAM (2003) CAPRA (2012)	2003, 2012	Average annual forest growth (percentage) for the period 2003 - 2012. Areas were intersected with province area not including water bodies.
	Drought Susceptibility	ONAMET		Percentage of the total Provincial area that is susceptible to drought. Drought includes areas designated as semi-arid or sub-humid dry.
Population Pressures	Average Annual Population Change	ONE - 2010 Population and Household Census (Population Projections)	2011, 2016	Average annual percent population change for the period 2011 - 2016. Both populations were projected.
	Average Annual Urban Population Change	ONE - Population and Household Census	2002, 2010	Average annual percent urban population growth for the period 2002 - 2010.

Vulnerability				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
Gender Inequality	Female to Male Years of School Ratio	ONE - Population and Household Census	2010	Ratio of female average number of years of schooling to male.
	Female to Male Labor Participation Ratio	ONE - Population and Household Census	2010	Ratio of female labor participation rate to male labor participation rate. Labor participation ratio includes employed, unemployed, and looking for first job persons / (total - no answer).
	Proportion of Female Seats in Government	JCE - Election Results	2016	Proportion of elected female officials at the local, municipal, and provincial level.

Coping Capacity

Environmental Capacity

Protected Natural and Reforested Areas

Economic Capacity

Debt to Service Ratio

Employment Rate

Average Annual Income

Governance

Voter Participation

Households with Garbage Collection Services

Homicide Rate

Infrastructure Capacity

Health Care Capacity

Average Distance to Hospital

Hospitals Beds/Nurses/Physicians per 10,000 Persons

Vaccination Coverage

Communications Capacity

Households with Fixed Telephone Access

Households with Mobile Telephone Access

Transportation Capacity

Distance to Nearest Port & Airport

Road Density

Table 176. Coping Capacity Scores and Ranks

Province	Coping Capacity Index		Economic Capacity		Governance		Environmental Capacity		Infrastructure Index		Health Care (Infra)		Transportation (Infra)		Communication (Infra)	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Azua	0.536	7	0.305	24	0.873	1	0.687	4	0.378	25	0.403	18	0.493	20	0.239	26
Baoruco	0.349	30	0.247	26	0.458	23	0.42	9	0.318	28	0.453	14	0.4	27	0.1	29
Barahona	0.435	21	0.375	18	0.523	15	0.374	10	0.429	23	0.496	9	0.502	17	0.288	25
Dajabón	0.424	22	0.195	31	0.627	7	0.112	26	0.552	9	0.706	3	0.47	22	0.481	19
Distrito Nacional	0.639	1	0.692	4	0.509	17	0	32	0.931	1	0.793	2	1	1	1	1
Duarte	0.422	24	0.465	15	0.326	30	0.132	24	0.572	8	0.583	6	0.506	15	0.627	9
El Seibo	0.305	31	0.292	25	0.403	29	0.048	30	0.307	29	0.319	25	0.425	24	0.178	28
Elías Piña	0.242	32	0.14	32	0.43	27	0.173	22	0.179	32	0.476	11	0.054	32	0.008	31
Espaillat	0.451	20	0.539	10	0.446	24	0.02	31	0.51	13	0.294	28	0.607	11	0.628	8
Hato Mayor	0.461	19	0.363	20	0.63	6	0.289	16	0.447	20	0.478	10	0.474	21	0.389	20
Hermanas Mirabal	0.486	11	0.626	5	0.283	32	0.101	27	0.678	4	0.813	1	0.617	10	0.603	12
Independencia	0.399	27	0.22	28	0.495	20	0.839	2	0.335	26	0.669	4	0.278	30	0.059	30
La Altagracia	0.515	9	0.791	1	0.442	25	0.223	19	0.409	24	0.177	32	0.502	18	0.548	15
La Romana	0.528	8	0.472	14	0.632	5	0.325	13	0.547	10	0.26	31	0.701	4	0.68	5
La Vega	0.547	5	0.554	8	0.541	13	0.464	7	0.575	7	0.425	16	0.665	6	0.635	7

Province	Coping Capacity Index		Economic Capacity		Governance		Environmental Capacity		Infrastructure Index		Health Care (Infra)		Transportation (Infra)		Communication (Infra)	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
María Trinidad Sánchez	0.423	23	0.435	17	0.495	21	0.112	25	0.443	22	0.309	27	0.529	13	0.493	17
Monseñor Nouel	0.508	10	0.475	13	0.59	9	0.355	12	0.511	12	0.411	17	0.436	23	0.685	4
Monte Cristi	0.475	14	0.477	12	0.575	11	0.252	18	0.448	19	0.473	12	0.503	16	0.368	21
Monte Plata	0.365	29	0.312	23	0.506	19	0.195	20	0.333	27	0.264	30	0.498	19	0.238	27
Pedernales	0.419	25	0.322	22	0.507	18	1	1	0.233	31	0.309	26	0.383	28	0.006	32
Peravia	0.462	18	0.543	9	0.32	31	0.303	15	0.577	6	0.451	15	0.645	8	0.635	6
Puerto Plata	0.579	3	0.747	2	0.637	4	0.136	23	0.499	14	0.335	24	0.578	12	0.584	13
Samaná	0.463	16	0.51	11	0.437	26	0.441	8	0.451	18	0.348	22	0.65	7	0.354	22
San Cristóbal	0.463	17	0.361	21	0.536	14	0.32	14	0.54	11	0.391	21	0.619	9	0.611	11
San José de Ocoa	0.47	15	0.369	19	0.593	8	0.477	6	0.445	21	0.58	7	0.424	25	0.329	23
San Juan	0.367	28	0.218	29	0.582	10	0.373	11	0.299	30	0.397	20	0.191	31	0.311	24
San Pedro de Macorís	0.485	12	0.457	16	0.521	16	0.087	28	0.61	5	0.518	8	0.7	5	0.612	10
Sánchez Ramírez	0.401	26	0.247	27	0.565	12	0.183	21	0.465	16	0.473	13	0.405	26	0.518	16
Santiago	0.606	2	0.713	3	0.419	28	0.633	5	0.678	3	0.399	19	0.752	3	0.884	3

Province	Coping Capacity Index		Economic Capacity		Governance		Environmental Capacity		Infrastructure Index		Health Care (Infra)		Transportation (Infra)		Communication (Infra)	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Santiago Rodríguez	0.475	13	0.207	30	0.661	3	0.766	3	0.461	17	0.595	5	0.304	29	0.485	18
Santo Domingo	0.544	6	0.571	6	0.485	22	0.051	29	0.739	2	0.29	29	0.953	2	0.976	2
Valverde	0.556	4	0.561	7	0.72	2	0.283	17	0.478	15	0.34	23	0.524	14	0.571	14

Table 177. Coping Capacity Metadata

Coping Capacity				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
Environmental Capacity	Protected Area	CAPRA/CNE	2008	Percentage of protected area by province.
Infrastructure - Healthcare	Physicians per 10000 Persons	MSP - Salud Indicadores Basicos	2014	Number of physicians per 10,000 persons. Only includes Ministry of Public Health doctors. Private sector doctors are not included.
	Nurses per 10000 Persons	MSP - Salud Indicadores Basicos	2014	Number of nurses per 10,000 persons. Only includes Ministry of Public Health nurses. Private sector nurses may not be included.
	Average Distance to Hospital	MSP (Health Centers) Landscan 2014 (Population)	2014 (Population)	Average distance to hospitals (km). Average distance was calculated for population areas only. Populated areas were estimated using the 2014 Landscan population grid, including all areas with population above zero.
	Hospital Beds per 10000 Persons	MSP - Salud Indicadores Basicos	2014	Number of hospital beds per 10,000 persons. Includes public and private hospitals, including MSP, IDSS, ANDECLIP.
Infrastructure – Healthcare – Vaccination Coverage	Polio Immunization Coverage	MSP - Salud Indicadores Basicos	2014	Proportion of the population under the age of one who received a Polio vaccine. Provinces that reported higher than 100 were set to 100.
	Measles Immunization Coverage	MSP - Salud Indicadores Basicos	2013	Proportion of the population aged 12 to 23 months vaccinated against measles. Provinces that reported higher than 100 were set to 100.
	DPT Immunization Coverage	MSP - Salud Indicadores Basicos	2014	Proportion of the population under the age of one who received a DPT (Diphtheria, Pertussis, and Tetanus) vaccine. Provinces that reported higher than 100 were set to 100.

Coping Capacity				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
	Tuberculosis Immunization Coverage	MSP - Salud Indicadores Basicos	2014	Proportion of the population under the age of one who received a Tuberculosis vaccine. Provinces that reported higher than 100 were set to 100.
Infrastructure - Transportation	Average Distance to Port	Airports - DAFIF (Global Data) Seaports - NGA (Global Data)	2014	Average distance to a port (airport or seaport) in km. Average distance was calculated for populated areas only. Populated areas were estimated using the 2014 Landscan population grid, including all areas with population above zero.
	Road Density	MTC - Road Network	2010	Total length of road (km) per sq kilometer.
Infrastructure - Communications	Households with Fixed Phone	ONE - Population and Household Census	2010	Percentage of households with access to a fixed phone.
	Households with Cell Phone	ONE - Population and Household Census	2010	Percentage of households with access to a cellular phone.
Economic Capacity	Debt to Service Ratio	ONE	2013	Expense to income ratio.
	Employment Rate	ONE	2010	Percentage of people who are employed versus unemployed (includes unemployed and those looking for a first job).
	Average Annual Income per Capita	PNUD	2010	Average annual income per capita in 2010.
Governance	Garbage Collection	MSP - Data Provider ONE - Original Data	2010	Percentage of households with access to garbage collection services.

Coping Capacity				
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**
	Registered Voter Participation	JCE	2016	Percentage of the population that is registered to vote that voted in the 2016 election.
	Homicide Rate	ONE	2014	Number of homicides per 100,000 persons.

Appendix B: RVA Index Construction

After finalizing the datasets for the analysis, indicators were created. Indicators are simply standardized datasets representing one aspect of multi-hazard risk that can be combined in a meaningful way. The indicators used to create subcomponent indices represent a wide range of concepts and are often measured using inconsistent units, ranges, and scales. To make meaningful comparisons between concepts, and to combine them and perform the mathematical operations required to create a single composite index score, indicator values were normalized. Normalization produces a consistent value range and direction across all indicators.

However, as data skewness and outliers may heavily influence the distribution of observations along a normalized scale, some transformations were made prior to rescaling. Minimums, maximums, standard deviations, means, and skew were calculated for each dataset. Datasets showing substantial skewness (beyond +/-1) were evaluated on a case by case basis and transformed using common statistical methods (e.g., natural log, square root, or cube root). In addition to controlling for skewness, indicators were evaluated to ensure consistent conceptual direction between the data and the overall concept modeled in the subcomponent and component index. For example, an indicator of households' access to internet is included within the Information Access Vulnerability subcomponent in the Vulnerability Index. However, *increases* in household internet access conceptually *decrease* vulnerability. To match the direction of the indicator with its effect on overall vulnerability, the data is transformed using the reflection equation:

(Indicator maximum value + 1) – Observed indicator value

Following these transformations, indicators were normalized to create scaled scores ranging from 0 to 1, with the following equation:

(Observed indicator value – Indicator minimum value) /

(Indicator maximum value – Indicator minimum value)

In cases where an indicator observed value was outside +/- 3 standard deviations from the mean, these were excluded from the scaling equation (e.g., 'indicator minimum value' and 'indicator maximum value' in the above equation). Instead the value closest to 3 standard deviations of the mean (without exceeding) was substituted, replacing the minimum or maximum value.

This approach to establishing minimum and maximum values conceptually anchors the range, indicating relative position between the "worst realistic case" and the "best realistic case" for each indicator in the country. Subcomponent scores represent the unweighted average of indicators. Likewise, component Indices (MHE, V, and C) represent the average of their respective subcomponent scores. This

method maintains a consistent scale and range through the index construction hierarchy, with a minimum value of 0 and a maximum value of 1.

It is important to note that "0" does not represent "No Risk," (or Hazard Exposure or Coping Capacity or Vulnerability), but instead indicates the minimum realistic case relative to the data analyzed for the country. The resulting indices are mapped using a quantile classification to illustrate the relative distribution of each overall concept throughout Dominican Republic.

Appendix C: CDM Survey I

Introduction

As part of CDM data gathering efforts, stakeholder participants completed an initial survey during the NDPBA Kickoff Meeting/Initial Knowledge Exchange inn Santo Domingo, Dominican Republic, on 08 March, 2016. Survey questions were designed to provide insight into how participants perceive CDM efforts within their country. Survey I included a total of 24 questions, four of which required short answer responses. Frequency tables of responses to survey questions 1-21 are included for reference.

Table 178. Organizational Affiliation of Survey Respondents (CDM Survey I)

Organizational Affiliation of Survey Respondents	Number	Percent (%)
Government Agencies	14	42%
Local Government	0	0%
INGOs	1	3%
UN	1	3%
University	1	3%
Other	0	0%
Unknown	16	49%

Table 179. Age of Survey Respondents (CDM Survey I)

Age of Survey Respondents (years)	Number	Percent (%)
18-25	2	6%
26-30	4	13%
31-40	3	9%
41-50	11	33%
51-60	7	21%
61-65	2	6%
Over 65	3	9%
Not stated	1	3%

Table 180. Gender of Survey Respondents (CDM Survey I)

Gender of Survey Respondents	Number	Percent (%)
Female	9	27%
Male	23	70%
Not stated	1	3%

Survey responses were validated through interviews conducted over the course of the project. Interview subjects represented national and subnational government organizations and NGOs, and included leaders and specialists in the field of disaster management.

Frequency Tables of CDM Survey I Responses

Table 181. Survey I Response - Question 1

Are you in a position of leadership within your organization?		
	Frequency	Percent
Yes	22	66.7
No	9	27.3
I don’t know	0	0
Does not apply	1	3
Missing	1	3
Total	33	100

Table 182. Survey I Response - Question 2

Do you feel you have the necessary resources to effectively perform your job requirements?		
	Frequency	Percent
Yes	15	45.5
No	15	45.5
I don’t know	0	0
Does not apply	1	3
Missing	2	6.1
Total	33	100

Table 183. Survey I Response - Question 3

In your current position, have you been provided with opportunities for disaster management training?		
	Frequency	Percent
Yes	26	78.8
No	5	15.2
I don’t know	1	3
Does not apply	1	3
Missing	0	0
Total	33	100

Table 184. Survey I Response - Question 4

Does your organization require you to complete training on disaster management?		
	Frequency	Percent
Yes	25	75.8
No	2	6.1
I don’t know	0	0
Does not apply	4	12.1
Missing	2	6.1
Total	33	100

Table 185. Survey I Response - Question 5

Has disaster management training improved your ability to effectively perform your job duties/requirements?		
	Frequency	Percent
Yes	25	75.8
No	2	6.1
I don’t know	0	0
Does not apply	4	12.1
Missing	2	6.1
Total	33	100

Table 186. Survey I Response - Question 6

Have you experienced any barriers to attending disaster management training?		
	Frequency	Percent
Yes	2	6.1
No	26	78.8
I don’t know	0	2.2
Does not apply	3	9.1
Missing	2	6.1
Total	33	100

Table 187. Survey I Response - Question 7

Does your organization have a dedicated budget for disaster preparedness?		
	Frequency	Percent
Yes	12	36.4
No	14	42.4
I don’t know	4	12.1
Does not apply	1	3
Missing	2	6.1
Total	33	100

Table 188. Survey I Response - Question 8

Does your organization have a dedicated budget for disaster response?		
	Frequency	Percent
Yes	10	30.3
No	15	45.5
I don’t know	5	15.2
Does not apply	1	3
Missing	2	6.1
Total	33	100

Table 189. Survey I Response - Question 9

Does your organization have mutual-aid agreements in place?		
	Frequency	Percent
Yes	18	54.5
No	4	12.1
I don’t know	6	18.2
Does not apply	1	3
Missing	4	12.1
Total	33	100

Table 190. Survey I Response - Question 10

In your opinion, does your organization have sufficient inventory to respond to a large-scale disaster?		
	Frequency	Percent
Yes	7	21.2
No	18	54.5
I don’t know	3	9.1
Does not apply	2	6.1
Missing	3	9.1
Total	33	100

Table 191. Survey I Response - Question 11

Do you feel that existing disaster risk reduction laws are being adequately implemented at the national level?		
	Frequency	Percent
Yes	9	27.3
No	20	60.6
I don’t know	2	6.1
Does not apply	0	0
Missing	2	6.1
Total	33	100

Table 192. Survey I Response - Question 12

Do you feel that existing disaster risk reduction laws are being adequately implemented at the subnational level?		
	Frequency	Percent
Yes	4	12.1
No	20	60.6
I don’t know	7	21.2
Does not apply	0	0
Missing	2	6.1
Total	33	100

Table 193. Survey I Response - Question 13

In your opinion, do Provinces actively support disaster management?		
	Frequency	Percent
Yes	10	30.3
No	17	51.5
I don’t know	3	9.1
Does not apply	0	0
Missing	3	9.1
Total	33	100

Table 194. Survey I Response - Question 14

In your opinion, is there adequate local support for disaster risk reduction?		
	Frequency	Percent
Yes	5	15.2
No	23	69.7
I don’t know	3	9.1
Does not apply	0	0
Missing	2	6.1
Total	33	100

Table 195. Survey I Response - Question 15

In your opinion, do Provinces currently have the capacity to effectively respond to local disasters?		
	Frequency	Percent
Yes	3	9.1
No	23	69.7
I don’t know	6	18.2
Does not apply	0	0
Missing	1	3
Total	33	100

Table 196. Survey I Response - Question 16

In your opinion, is there strong support of public-private partnerships in disaster management at the local level?		
	Frequency	Percent
Yes	7	21.2
No	19	57.6
I don’t know	5	15.2
Does not apply	0	0
Missing	2	6.1
Total	33	100

Table 197. Survey I Response - Question 17

In your opinion, are non-government organizations (NGOs) actively engaged in disaster preparedness at the local level?		
	Frequency	Percent
Yes	19	57.6
No	4	12.1
I don’t know	8	24.2
Does not apply	0	0
Missing	2	6.1
Total	33	100

Table 198. Survey I Response - Question 18

In your opinion, is the National Disaster Fund adequate to support response to a major disaster?		
	Frequency	Percent
Yes	3	9.1
No	22	66.7
I don’t know	8	24.2
Does not apply	0	0
Missing	0	0
Total	33	100

Table 199. Survey I Response - Question 19

In your opinion, is the national disaster management budget adequate to respond to a major disaster?		
	Frequency	Percent
Yes	3	9.1
No	18	54.5
I don’t know	12	36.4
Does not apply	0	0
Missing	0	0
Total	33	100

Table 200. Survey I Response - Question 20

In your opinion, is there sufficient government inventory (supplies) to respond to a large-scale disaster?		
	Frequency	Percent
Yes	6	18.2
No	14	42.4
I don’t know	13	39.4
Does not apply	0	0
Missing	0	0
Total	33	100

Table 201. Survey I Response - Question 21

In your opinion, are non-government organizations (NGOs) effectively supporting national disaster management goals?		
	Frequency	Percent
Yes	21	63.6
No	6	18.2
I don’t know	5	15.2
Does not apply	1	3
Missing	0	0
Total	33	100

Participant Definitions of ‘Comprehensive Disaster Management’

Respondent	Definition
1	The integration of all sectors capable of assessing how to confront an event.
2	It is the way to visualize how to integrate all elements and markers that contribute to management but taking all stakeholders into account, as well as all infrastructure, and risk scenarios in a joint manner
3	It is the comprehensive process of participating and integrating in face of a threat, vulnerability, and disaster
4	It is the concept that intervenes in all risk mitigation, and prevention components and the efficient response to disasters
5	These are the policies, activities, resources and means for an institution and/or an administrator to face any contingency with quality
6	Comprehensive prevention, mitigation and response during all kinds of phenomena, both natural or manmade that affect human lives in general

Respondent	Definition
7	As training, knowledge on a natural disaster
8	It is a development entity that seeks the safety of the same. It takes into account all the elements and shapes that lead to the safety of human lives and property in face of adverse phenomena. It is a strategy that includes knowing the phenomena, the characteristics of the population, resources, to reduce the impacts of adverse phenomena.
9	This criterion makes reference to risk reduction actions, and policies.
10	After a vulnerability assessment work to mitigate them as much as possible, and based on this, express the responses (management of prevention, mitigation and response)
11	This makes reference to the policies, actions, and other to minimize the risks, either applied in the prospective or reactive application, etc.
12	It is the real tool to be applied in different situations that might arise in a given moment.
13	The organization of resources and capabilities to reduce the impact of an event that causes a disaster.
14	It is the set of actions to be taken from readiness, prevention, mitigation and response to safeguard lives and properties
15	Have available all the means necessary to foresee and act in face of a disaster.
16	The joint capacity to assess risks and vulnerabilities in face of a disaster.
17	It allows working in all the steps and all factors of a disaster. It is the most complete way to prepare ourselves to face a disaster.
18	The way to approach a series of threats, risks and vulnerabilities in an inter-sector way and with discipline to reduce mortality among a given population
19	It is the management of the elements that are part of disaster management, including prevention, mitigation, response and reconstruction and the management of all stakeholders both governmental and non-governmental throughout the process.

Respondent	Definition
20	The way of approaching disaster situations in an integrated manner through an incident command system.
21	Set of inter-related institutions that contribute to mitigation, analysis and data to face risks and disasters.
22	Integrate all aspects that might be present in a disaster to learn how to improve them
23	A system that allows integrating all possible response scenarios in face of some natural disasters and also the most important institutions involved so that all have equal Access and collaborate jointly to continuously improve.
24	It refers to the complete approach of risks in face of a disaster, seen before, during and after they occur as well as the capacity to prevent and respond to all the organizations that are part of society.
25	Defined as the power to modulate and/or manage natural disasters that occur at the micro and macro level, that is, taking all the factors into account.
26	Coordination among institutions to face disasters.
27	It is the energy among all groups and institutions involved in the prevention, mitigation, and response to these events.
28	The involvement of all resources available in the management of a disaster.
29	We have to be prepared and have planned the “before, during and after” of a disaster.

Appendix D: CDM Survey II

Introduction

As part of CDM data gathering efforts, stakeholder participants completed a second survey during the NDPBA Knowledge Exchange II on 14 September 2016. Survey II was designed to assess the presence of comprehensive disaster management plans, specific components of disaster management plans, and the drilling and exercising of plans within organizations at both the national and subnational level. Survey II included a total of 32 questions, five of which required short answer responses. Frequency tables of responses to survey questions 1-28 are included for reference.

Table 202. Organizational Affiliation of Survey Respondents (CDM Survey II)

Organizational Affiliation of Survey Respondents	Number	Percent (%)
Central Government	28	62%
Local Government	1	2%
NGOs	1	2%
UN	0	0%
Universities	2	5%
Not stated	13	29%

Table 203. Age of Survey Respondents (CDM Survey II)

Age of Survey Respondents (years)	Number	Percent (%)
18-25	3	7%
26-30	5	11%
31-40	15	33%
41-50	5	11%
51-60	6	13%
61-65	2	5%
Over 65	0	0%
Not stated	9	20%

Table 204. Gender of Survey Respondents (CDM Survey II)

Gender of Survey Respondents	Number	Percent (%)
Female	13	29%
Male	27	60%
Not stated	5	11%

Survey responses were validated during interviews conducted by PDC staff over the course of the project. Interview subjects represented national and subnational government organizations and NGOs, and included leaders and specialists in disaster management.

Frequency Tables of CDM Survey II Responses

Table 205. Survey II Response - Question 1

Does your organization have a comprehensive disaster management plan?		
	Frequency	Percent
Yes	35	77.8
No	8	17.8
I don’t know	2	4.4
Does not apply	0	0
Missing	0	0
Total	45	100

Table 206. Survey II Response - Question 2

Does your organization have a disaster response plan?		
	Frequency	Percent
Yes	35	77.8
No	7	15.6
I don’t know	2	4.4
Does not apply	1	2.2
Missing	0	0
Total	45	100

Table 207. Survey II Response - Question 3

Does your organization have a disaster preparedness plan?		
	Frequency	Percent
Yes	35	77.8
No	6	13.3
I don’t know	3	6.7
Does not apply	0	0
Missing	1	2.2
Total	45	100

Table 208. Survey II Response - Question 4

Does your organization have a disaster mitigation plan?		
	Frequency	Percent
Yes	34	75.6
No	6	13.3
I don’t know	4	8.9
Does not apply	0	0
Missing	1	2.2
Total	45	100

Table 209. Survey II Response - Question 5

Does your organization have a recovery plan?		
	Frequency	Percent
Yes	30	66.7
No	9	19.0
I don't know	6	13.3
Does not apply	0	0
Missing	0	0
Total	45	100

Table 210. Survey II Response - Question 6

Did you participate in the drafting of any of the disaster plans?		
	Frequency	Percent
Yes	27	60
No	17	37.8
I don't know	1	2.2
Does not apply	0	0
Missing	0	0
Total	45	100

Table 211. Survey II Response - Question 7

Do you have a copy of the disaster management plan(s)?		
	Frequency	Percent
Yes	19	42.2
No	25	55.6
I don't know	1	2.2
Does not apply	0	0
Missing	0	0
Total	45	100

Table 212. Survey II Response - Question 8

Does your disaster management plan include information on all hazard types (example: earthquakes, landslide, tsunami, extreme cold, floods, etc.)?		
	Frequency	Percent
Yes	27	60
No	11	24.4
I don't know	2	4.4
Does not apply	3	6.7
Missing	2	4.4
Total	45	100

Table 213. Survey II Response - Question 9

Has your plan been shared with other agencies or organizations active in disaster management?		
	Frequency	Percent
Yes	28	62.2
No	9	20
I don't know	6	13.3
Does not apply	1	2.2
Missing	1	2.2
Total	45	100

Table 214. Survey II Response - Question 10A

Are your organization's disaster plans updated regularly?		
	Frequency	Percent
Yes	24	53.3
No	10	22.2
I don't know	6	13.3
Does not apply	4	8.9
Missing	1	2.2
Total	45	100

Table 215. Survey II Response - Question 10B

Are your organization's disaster plans tested, drilled or exercised regularly?		
	Frequency	Percent
Yes	21	46.6
No	19	42.3
I don't know	2	4.4
Does not apply	1	2.3
Missing	2	4.4
Total	45	100

Table 216. Survey II Response - Question 11

Do your disaster plans address public outreach?		
	Frequency	Percent
Yes	23	51.1
No	17	37.8
I don't know	4	8.9
Does not apply	1	2.2
Missing	0	0
Total	45	100

Table 217. Survey II Response - Question 12

Do your disaster plans address early warning?		
	Frequency	Percent
Yes	21	46.7
No	16	35.6
I don't know	7	15.6
Does not apply	0	0
Missing	1	2.2
Total	45	100

Table 218. Survey II Response - Question 13

Do your disaster plans address evacuation?		
	Frequency	Percent
Yes	28	62.2
No	13	28.9
I don't know	3	6.7
Does not apply	0	0
Missing	1	2.2
Total	45	100

Table 219. Survey II Response - Question 14

Do your disaster plans address logistics management (the movement of personnel and resources during times of disasters)?		
	Frequency	Percent
Yes	28	62.2
No	11	24.4
I don't know	4	8.9
Does not apply	1	2.2
Missing	1	5.6
Total	45	100

Table 220. Survey II Response - Question 15

Do your disaster plans address shelter operations?		
	Frequency	Percent
Yes	26	57.8
No	12	26.7
I don't know	3	6.7
Does not apply	2	4.4
Missing	2	4.4
Total	45	100

Table 221. Survey II Response - Question 16

Do your disaster plans address when and how to activate the Emergency Operation Center?		
	Frequency	Percent
Yes	17	37.8
No	22	48.9
I don’t know	1	2.2
Does not apply	3	6.7
Missing	2	4.4
Total	45	100

Table 222. Survey II Response - Question 17

Does your organization have a separate standard operating procedure (SOP) for how to activate the Emergency Operation Center?		
	Frequency	Percent
Yes	30	66.7
No	11	24.4
I don’t know	2	4.4
Does not apply	1	2.2
Missing	1	2.2
Total	45	100

Table 223. Survey II Response - Question 18

Do your disaster plans address transportation during times of disasters?		
	Frequency	Percent
Yes	23	51.1
No	10	22.2
I don’t know	8	17.8
Does not apply	2	4.4
Missing	2	4.4
Total	45	100

Table 224. Survey II Response - Question 19

Do your disaster management plans address emergency communications during times of disaster?		
	Frequency	Percent
Yes	23	51.1
No	15	33.3
I don’t know	5	11.1
Does not apply	2	4.4
Missing	0	0
Total	45	100

Table 225. Survey II Response - Question 20

Do your disaster plans address public works and engineering?		
	Frequency	Percent
Yes	24	53.3
No	14	31.1
I don't know	4	8.9
Does not apply	2	4.4
Missing	1	2.2
Total	45	100

Table 226. Survey II Response - Question 21

Do your disaster plans address public health and medical services?		
	Frequency	Percent
Yes	11	24.4
No	27	60
I don't know	2	4.4
Does not apply	4	8.9
Missing	1	2.2
Total	45	100

Table 227. Survey II Response - Question 22

Do your plans address search and rescue?		
	Frequency	Percent
Yes	19	42.2
No	17	37.8
I don't know	6	13.3
Does not apply	3	6.7
Missing	0	0
Total	45	100

Table 228. Survey II Response - Question 23

Do your plans address oil and hazardous materials response (chemical, biological, radiological, etc.)?		
	Frequency	Percent
Yes	20	44.4
No	19	42.2
I don't know	2	4.4
Does not apply	3	6.7
Missing	1	2.2
Total	45	100

Table 229. Survey II Response - Question 24

Do your plans address agriculture and natural resources?		
	Frequency	Percent
Yes	15	33.3
No	26	57.8
I don't know	2	4.4
Does not apply	2	4.4
Missing	0	0
Total	45	100

Table 230. Survey II Response - Question 25

Do your plans address public safety and security?		
	Frequency	Percent
Yes	11	24.4
No	23	51.1
I don't know	7	15.6
Does not apply	4	8.9
Missing	0	0
Total	45	100

Table 231. Survey II Response - Question 26

Do your plans address long-term community recovery?		
	Frequency	Percent
Yes	15	33.3
No	22	48.9
I don't know	1	2.2
Does not apply	2	4.4
Missing	5	11.2
Total	45	100

Table 232. Survey II Response - Question 27

Does your organization have strong disaster management leadership?		
	Frequency	Percent
Yes	13	28.9
No	20	44.4
I don't know	7	15.6
Does not apply	3	6.7
Missing	2	4.4
Total	45	100

Table 233. Survey II Response - Question 28

Do you think your organization has an effective disaster management program?		
	Frequency	Percent
Yes	25	55.6
No	19	42.2
I don't know	1	2.2
Does not apply	0	0
Missing	0	0
Total	45	100

Table 234. Survey II Response - Question 29

How often are your SOPs reviewed and updated?		
	Frequency	Percent
Annual	17	37.8
Every 2 years	9	20
Every 5+ years	3	6.7
Not updated	12	26.7
Missing	4	8.8
Total	45	100

Participant Definitions of 'Effective Disaster Management'

Respondent	Definition
1	Risk management is the commitment to prepare societies to face disasters and provide an adequate response
2	When we work from the reduction knowledge and management of a response in face of a disaster
3	It is when resources available are managed in an effective manner with regards to disasters
4	It is knowing the risks, knowing how to prepare for them and undertaking actions to reduce the problems caused by a disaster
5	How the tools allow people and organizations to respond and act effectively in the event of a disaster
6	It is when all resources and staff necessary to respond to a disaster and/or emergency are managed in a viable manner.

Respondent	Definition
7	It is the one in charge of managing all human and economic assistance in face of a disaster.
8	Preparedness for response as necessary from time to time and with quality (timely response)
9	With the existence of knowledge and the awareness of what can happen to lessen the risk
10	Lasting capability of an organization and/or entity to face any risk
11	Disaster management achieving the results expected
12	The one that focuses on prevention and prior preparedness
13	One that concentrates its resources and handles them in such a way that it complies with the purpose of safeguarding lives and goods in the event of a disaster
14	Preventive and a good resilience capability
15	A management governed by planning, in other words based on prevention.
16	A management that covers all needs arising in an efficient and timely manner
17	Generating a risk management plan, training the most vulnerable population and having teams ready

Appendix E: CDM Survey III

Introduction

As part of comprehensive disaster management (CDM) data gathering efforts, stakeholder participants completed a third survey during the NDPBA Knowledge Exchange II on 14 September 2016. Survey III explored aspects of disaster response activities within the country, including resources and capacity building, damage and needs assessments, staffing, roles and responsibilities during disaster response operations, budget allocations, early warning system usage, the existence of mutual-aid agreements, response partnerships and collaboration, and the operationalization of Emergency Operations Centers. Survey III included 21 questions, six of which required short answer responses. Frequency tables of responses to survey questions 1-15 are included for reference.

Table 235. Organizational Affiliation of Survey Respondents (CDM Survey III)

Organizational Affiliation of Survey Respondents	Number	Percent (%)
Central Government	19	60%
Local Government	1	3%
NGOs	0	0%
UN	0	0%
Universities	1	3%
Not stated	11	34%

Table 236. Age of Survey Respondents (CDM Survey III)

Age of Survey Respondents (years)	Number	Percent (%)
18-25	2	6%
26-30	8	25%
31-40	8	25%
41-50	5	16%
51-60	6	19%
61-65	0	0%
Over 65	0	0%
Not stated	3	9%

Table 237. Gender of Survey Respondents (CDM Survey II)

Gender of Survey Respondents	Number	Percent (%)
Female	9	28%
Male	20	63%
Not stated	3	9%

Survey responses were validated through interviews conducted over the course of the project. Interview subjects represented national and subnational government organizations and NGOs, and included leaders and specialists in disaster management.

Frequency Tables of CDM Survey III Responses

Table 238. Survey III Response - Question 1

Is your organization active in disaster response?		
	Frequency	Percent
Yes	20	62.5
No	8	25
I don't know	3	9.4
Does not apply	0	0
Missing	1	3.1
Total	32	100

Table 239. Survey III Response - Question 2

In your opinion, was the national response to the last major disaster effective?		
	Frequency	Percent
Yes	17	53.1
No	7	21.9
I don't know	8	25
Does not apply	0	0
Missing	0	0
Total	32	100

Table 240. Survey III Response- Question 3

Do you feel that disaster alert/warning messages were issued effectively during the last disaster?		
	Frequency	Percent
Yes	16	50
No	8	25
I don't know	5	15.6
Does not apply	0	0
Missing	3	9.4
Total	32	100

Table 241. Survey III Response - Question 4

In your opinion, was the mobilization of resources and response personnel effective during the last disaster?		
	Frequency	Percent
Yes	15	30.3
No	7	24.2
I don’t know	8	36.4
Does not apply	1	0
Missing	1	9.1
Total	32	100

Table 242. Survey III Response - Question 5

Does your organization have pre-established agreements for support during times of disaster (i.e. mutual aid agreements)?		
	Frequency	Percent
Yes	25	78.1
No	2	6.3
I don’t know	4	12.5
Does not apply	0	0
Missing	1	3.1
Total	32	100

Table 243. Survey III Response- Question 6

Is your organization responsible for post-disaster damage and needs assessments?		
	Frequency	Percent
Yes	18	56.3
No	8	25
I don’t know	2	6.3
Does not apply	1	3.1
Missing	3	9.4
Total	32	100

Table 244. Survey III Response - Question 7A

Were post-disaster damage and needs assessments conducted following the last major disaster?		
	Frequency	Percent
Yes	22	68.8
No	1	3.1
I don’t know	6	18.8
Does not apply	2	6.3
Missing	1	3.1
Total	32	100

Table 245. Survey III Response - Question 7B

If yes, were they done accurately?		
	Frequency	Percent
Yes	17	53.1
No	4	12.5
I don't know	3	9.4
Does not apply	1	3.1
Missing	7	21.9
Total	32	100

Table 246. Survey III Response - Question 8A

Does your organization maintain an Emergency Operations Center?		
	Frequency	Percent
Yes	19	59.4
No	10	31.3
I don't know	2	6.3
Does not apply	1	3.1
Missing	0	0
Total	32	100

Table 247. Survey III Response - Question 8B

If yes, does the Emergency Operations Center have adequate resources to perform its responsibilities effectively?		
	Frequency	Percent
Yes	11	34.4
No	9	28.1
I don't know	1	3.1
Does not apply	1	3.1
Missing	10	31.3
Total	32	100

Table 248. Survey III Response- Question 9

In your opinion, does your organization have adequate staffing to conduct disaster response?		
	Frequency	Percent
Yes	19	59.4
No	11	34.4
I don't know	1	3.1
Does not apply	1	3.1
Missing	0	0
Total	32	100

Table 249. Survey III Response - Question 10

Does your organization have a training program to help develop and build capacity in disaster management staff members?		
	Frequency	Percent
Yes	18	56.3
No	10	31.3
I don't know	1	3.1
Does not apply	2	6.3
Missing	1	3.1
Total	32	100

Table 250. Survey III Response - Question 11

In your opinion, are disaster response tasks clearly defined?		
	Frequency	Percent
Yes	17	53.1
No	9	28.1
I don't know	6	18.8
Does not apply	0	0
Missing	0	0
Total	32	100

Table 251. Survey III Response- Question 12

In your opinion, is there overlap between organizations active in disaster response in the Dominican Republic?		
	Frequency	Percent
Yes	14	43.8
No	7	21.9
I don't know	8	25.0
Does not apply	0	0
Missing	3	9.4
Total	32	100

Table 252. Survey III Response - Question 13

Does your organization engage with the military to support disaster response?		
	Frequency	Percent
Yes	19	59.4
No	8	25
I don't know	3	9.4
Does not apply	1	3.1
Missing	1	3.1
Total	32	100

Table 253. Survey III Response - Question 14

Does your organization engage with the private sector to support disaster response? **Frequency** **Percent**		
	Frequency	Percent
Yes	21	65.6
No	8	25
I don’t know	1	3.1
Does not apply	1	3.1
Missing	1	3.1
Total	32	100

Table 254. Survey III Response- Question 15A

Does your organization have a budget allocated for disaster response?		
	Frequency	Percent
Yes	14	43.8
No	11	34.4
I don’t know	6	18.8
Does not apply	0	0
Missing	1	3.1
Total	32	100

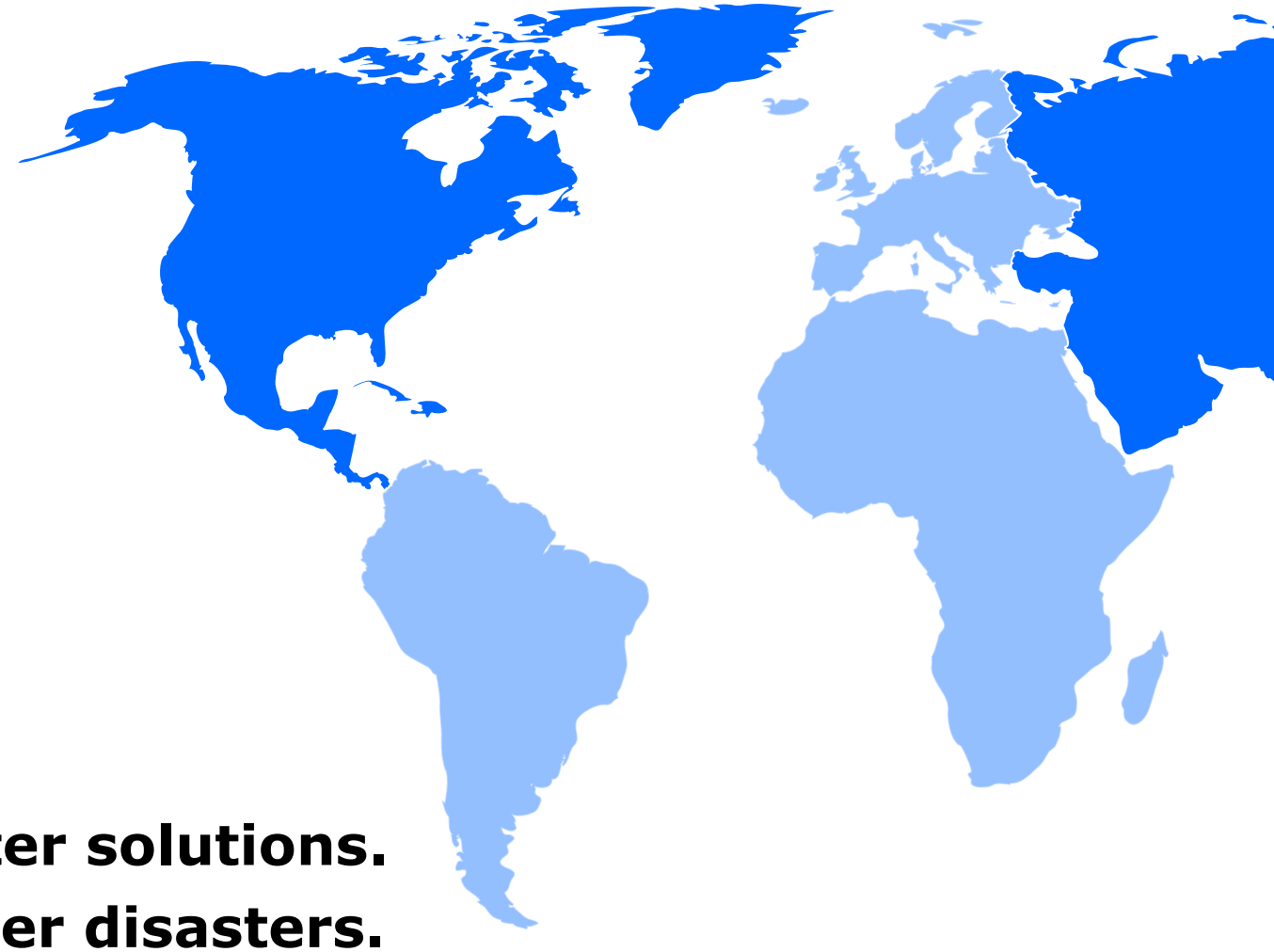
Table 255. Survey III Response- Question 15B

If yes, was the budget adequate for the last disaster response your organization conducted?		
	Frequency	Percent
Yes	4	12.5
No	9	28.1
I don’t know	7	21.9
Does not apply	1	3.1
Missing	11	34.4
Total	32	100

Participant Definitions of 'Effective Disaster Response'

Respondent	Definition
1	The one in which resources and staff needed to better respond to a disaster are managed
2	It is having all the resources that are needed during an event or disaster
3	Excellent
4	Good
5	The one based on inter-agency planning and coordination
6	The one based on institutional planning
7	Coordination among all sections and empowering civil society
8	In our case to provide information on a timely basis for better decision making
9	A good implementation of terms and responses and instrument for the staff
10	As a good compliance with the techniques and response of a trained staff
11	A positive and effective result to a natural disaster
12	Prepare and train the residents of the communities affected by events
13	Providing a good and timely response with the necessary resources and an adequately prepared staff
14	The management of all the physical and human resources for the prevention and mitigation of disasters
15	It is the fast resolution of the effects of a disaster

Respondent	Definition
16	Have the capacity to respond adequately to an emergency or a potential disaster
17	When the population has information before, during and after any natural event
18	An efficient response is timely, with professionally prepared staff and with the corresponding equipment
19	The capacity to respond before, during and after an exposure to a risk
20	Save lives
21	It is the one in which resources are used to better respond to a disaster in an efficient way
22	It is defined as the capacity to reduce risks
23	As the capacity of institutions to prepare themselves before hand and be able to be efficient in the event of a disaster



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