

PLANES DE MITIGACIÓN CONTRA PELIGROS NATURALES

Resiliencia Planificada



JUNTA DE PLANIFICACIÓN

2024

# Municipality of Corozal

Natural Hazard Mitigation Plan

Executive Summary

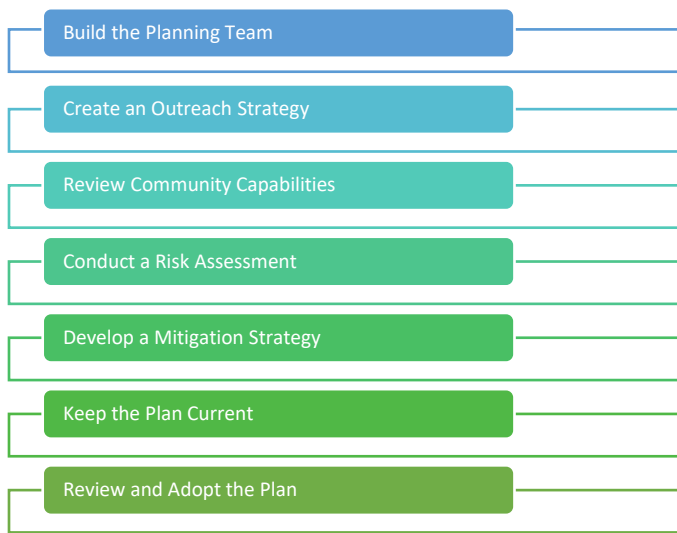


# 1 Introduction

The Municipality of Corozal has revised its Local Hazard Mitigation Plan (LHMP)<sup>1</sup> in accordance with the federal Disaster Mitigation Act of 2000 (DMA2K), which was signed into law to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. One of the requirements that this legislation establishes is that in order for the municipality to receive federal mitigation funds, it must elaborate and adopt a Federal Emergency Management Administration (FEMA) approved LHMP.<sup>2</sup> Also, the DMA2K promotes that the local government, together with the State, work on pre disaster planning and encourages the development of sustainable hazard mitigation activities.

These LHMPs must be revised and updated every five (5) years to remain in compliance with regulations and Federal mitigation grant conditions. This updating requirement offers the municipality an opportunity to reevaluate recommendations, monitor the implementation of mitigation strategies included in the previous Plan, monitor the impact of mitigation actions that have been implemented, and determine if any changes to the Plan need to be incorporated. This Plan complies with said regulations.

Figure 1: Hazard Mitigation Planning Process



## Hazard Mitigation Planning Process

The strategies and projects enumerated in the LHMP have the goal of reducing the loss of life and property that can result from a natural disaster. Hence, the mitigation strategies, included in the LHMP, involve planning efforts, capital projects, and other activities that reduces the impacts of the natural hazards included in Corozal’s LHMP of 2024.

The municipality has also revised the LHMP under the authority of Act 107-2020, known as the Municipal Code of Puerto Rico derogating Act 81-1991, Autonomous Municipalities Act of 1991. Section 1.010 of

said Act, *supra* (former section 2.004 of Act 81-1991), states that the municipality can carry out any activity that establish programs or adopt convenient and useful measures to prevent and fight fires, aid the community in cases of emergency or natural disasters, catastrophic accidents of fires and for the civil protection in general.

<sup>1</sup> Please note that the 2024 Revised HMP was written in Spanish as per agreement between the municipality, the Planning Board, the Governor’s Authorized Representative (GAR) and FEMA.

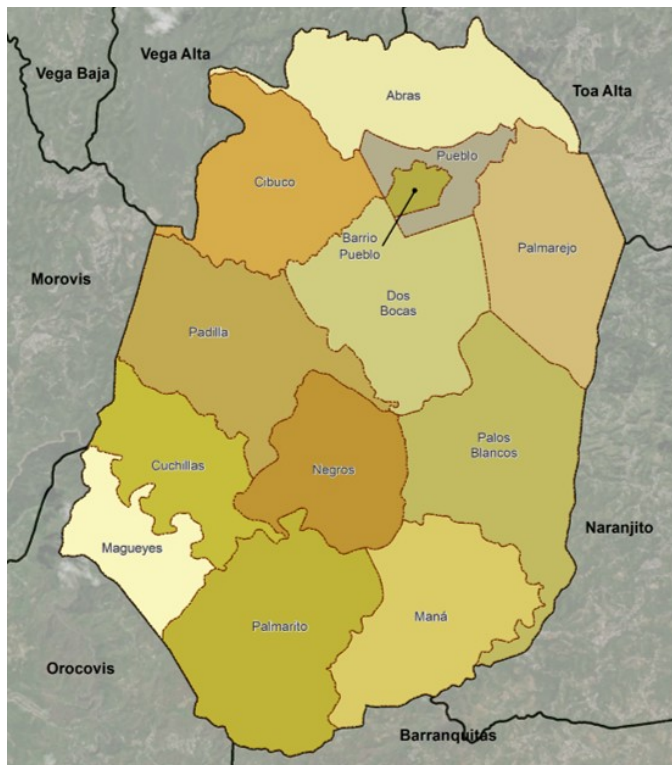
<sup>2</sup> 42 U.S.C 5165; 44 C.F.R. § 201.6.

This Executive Summary will provide an overview on:

- Corozal’s population characteristics;
- The public participation and outreach efforts with the community during the LHMP planning process;
- Corozal’s risk assessment;
- A review of the mitigation strategies, goals and LHMPs action plan; and
- Plan maintenance, and how to keep the Plan current.

## 2 Corozal’s Profile: Main Population Characteristics

Figure 2: Corozal and its wards



The Municipality of Corozal is located in the central-eastern region of Puerto Rico. Its northern border is the municipalities of Vega Baja and Toa Alta, to the south it borders the municipalities of Barranquitas and Orocovis, to the west is the Municipality of Morovis, and to the east is the Municipality of Naranjito. The Municipality of Corozal has a territorial area of approximately 42.6 square miles (110.0 square kilometers).

The Puerto Rico Planning Board, according to the most recent area delimitation, divides the island into eleven areas, grouping the different municipalities by their demographic trends and human settlements, infrastructure endowment, socioeconomic variables, sociodemographic characteristics, internal cohesion, and the resources and development potential of each. The Municipality of Corozal belongs to the Functional Area of San Juan, which is composed of the municipalities of San

Juan, Bayamón, Caguas, Carolina, Cataño, Corozal, Dorado, Guaynabo, Loíza, Naranjito, Trujillo Alto, Toa Alta, Toa Baja and Vega Alta.

The municipality has thirteen (13) official wards or “barrios”: Abras, Cibuco, Corozal Pueblo, Cuchillas, Dos Bocas, Magueyes, Maná, Negros, Padilla, Palmarejo, Palmarito, Palos Blancos, Pueblo.

Table 1: Population by age group: ASC 2010 and ASC 2020

Population	ASC 2010	ASC 2020	% Rate of Change
Younger than 5 years age	2,537	1,464	-42.29%
5 to 19 years of age	8,852	6,129	-30.76%
20 to 64 years of age	21,491	19,326	-10.07%
65 years of age and older	4,432	6,009	35.58%
<b>Total</b>	<b>37,312</b>	<b>32,928</b>	<b>-11.75%</b>

Source: US Census Bureau, American Community Survey 2006-2010 and 2016-2020 5-Year Estimates

According to the 2010 Census, Corozal has a total population of 2,991 people. 2020 Census reflected that Corozal’s population had decreased by 2,571 individuals. This represents a reduction of 6.92%. The wards that reflected an increase during this period were

Magueyes and Maná. Further details, regarding the profile of the municipality, can be found in Chapter 3, Section 3.2, of the updated 2024 LHMP.

### 3 Outreach and Public Participation

To guide the development of this Plan, Hon. Luis García Rolón, Mayor of Corozal, appointed the following officials to constitute the Mitigation Planning Committee (henceforth, the Planning Committee). The Planning Committee is comprised by representatives from several municipal dependencies, including community representation, with key roles and experience in community planning, public works, and emergency management to serve as key components in the planning process. Please refer to Section 2.5 on the LHMP.

Table 2: Hazard Mitigation Planning Committee

Name	Position	Dependency	Email/Phone
Hon. Luis A. García Rolón	Mayor	Mayor’s Office	<a href="mailto:luis.garcia@corozal.pr.gov">luis.garcia@corozal.pr.gov</a>
Juan E. Diaz Rivera	Ayudante Ejecutivo	Mayor’s Office	<a href="mailto:juan.diaz@corozal.pr.gov">juan.diaz@corozal.pr.gov</a>
Vilmarie Vega Ramos	Directora	Economic Planning and Development	<a href="mailto:vilmarie.vega@corozal.pr.gov">vilmarie.vega@corozal.pr.gov</a>
Danny Ortiz Hernández	Director	Municipal Emergency Management Office	<a href="mailto:danny.ortiz@corozal.pr.gov">danny.ortiz@corozal.pr.gov</a>
Jorge Martinez Vázquez	Director	Federal Programs	<a href="mailto:jorge.martinez@corozal.pr.gov">jorge.martinez@corozal.pr.gov</a>
Félix Suárez De León	Interim Director	Public Works Office	<a href="mailto:felix.suarez@corozal.pr.gov">felix.suarez@corozal.pr.gov</a>

The Planning Committee activities included: (1) updating the list of the municipality assets and local critical facilities; (2) updating the status of the previous LHMP mitigation strategies; (3) determine possible new mitigation strategies for the 2024 LHMP; (4) development and implementation of public participation and outreach activities and stakeholders at large such as neighboring municipalities, governmental agencies; (5) announce the municipality’s LHMP efforts to agencies, stakeholders and public feedback for Corozal’s LHMP 2024 draft version and incorporate such comments on the Plan.

An initial notice was published on a local newspaper (Primera Hora). Said notice informed the public about the first Public Participation meeting to be held in Corozal on April 26, 2022. A second notice was published regarding the publication of the 2024 LHMP draft version for review providing 25 days period for review, submit comments, and the opportunity to participate in a second community meeting held on December 1, 2022. A draft version of the 2024 LHMP was made available on the Puerto Rico Planning Board’s (PRPB) website (jp.pr.gov).

## 4 Corozal’s Risk Assessment

After reviewing the natural hazards identified as priorities on the previous Corozal’s 2020 LHMP, the Municipal Emergency Response Plan, the municipality’s disaster history, and other literature related to potential future hazards, the Planning Committee identified the following hazards in the 2024 LHMP: (1) Extreme Heat, (2) Drought, (3) Earthquakes, (4) Flooding, (5) Landslides, (6) Strong Winds (Tropical Cyclones), and (7) Wildfire. Discussion of these natural hazards are included in the 2024 LHMP’s Chapter 4. In addition, the 2024 LHMP includes a quantitative vulnerability analysis based on the best available data for Corozal and Puerto Rico accounting for future development to assess mitigation strategies to prevent repetitive and severe property loss.

This assessment served as a key tool for the Planning Committee and the public to identify and prioritize potential mitigation strategies by focusing attention on areas that present the greatest risk of damages to people, critical facilities, and normal municipality operations. The analysis for earthquakes, flooding, landslides, and high winds was performed by assessing the potential impacts from each hazard using geographic information system data (GIS).

By ranking each section, the municipality was in position to determine an overall risk classification. It is important to mention that this classification exercise resulted from the municipality’s 2024 LHMP technical risk assessment along with a capability gap analysis and the local community input, which is based on previous natural events experienced by the Planning Committee and the residents and business owners of Corozal.

The following table provides a summary of the risk classification for each identified hazard. Part of the process of completing the next appraisal required input from the community as well as from the Committee. Beyond the risk analysis, this table presents the municipality’s prioritization analysis.

*Table 3: Natural Hazard Ranking*

Natural Hazard	Risk to people	Risk to facilities	Risk to operations	Classification
Extreme Heat	1	1	1	Low
Drought	2	1	2	Moderate
Earthquake/Liquefaction	3	3	3	High
Flooding	3	3	3	High

Natural Hazard	Risk to people	Risk to facilities	Risk to operations	Classification
Landslide	3	3	3	High
Strong Winds/Tropical Cyclones	3	3	3	High
Wildfire	1	1	1	Low

Source: Planning Committee 2022-2023

High=3, Moderate=2, Low=1

Currently, the potential risks with the highest classification or greater impact identified for the municipality are seven: extreme heat, drought, earthquake/liquefaction, flooding, landslide, strong winds, and wildfire.

A ranking methodology was adopted to develop the mitigation strategies based on these risks as discussed on Chapter 6 and are divided into the following categories: (1) Prevention, (2) Property Protection, (3) Natural Resources Protection, (4) Structural Projects, (5) Emergency Services, and (6) Education and Public Awareness. The strategy category with the most mitigation actions is “Structural Projects” with a total of 17 mitigation projects. Likewise, flooding, strong winds and landslides are the natural hazards that are most addressed within the mitigation actions.

## 5 Mitigation Strategies, Goals, and Action Plan

The municipal capabilities, along with the risk assessment, serve as a foundation for the design, development, and implementation of mitigation strategies. Mitigation strategies, found in Chapter 6, consist of a broad number of local goals and strategies. The local mitigation actions were gathered from the 2020 LHMP and were incorporated into the current LHMP. This chapter provides information about the assigned implementation mechanisms and target completion dates. The sections in this chapter are designed to make the Plan strategic by identifying long-term goals, and functional, by identifying short term and immediate actions that will guide the daily local decision-making process and project implementation.

Mitigation goals consist of general guidelines that explain what the Municipality of Corozal wants to achieve in terms of hazards and mitigation. Thus, the goals included in the 2024 LHMP, offer the Planning Committee and the communities a framework for identifying, prioritizing, and implementing actions to reduce the risks associated to natural hazards in Corozal.

Mitigation strategies are activities, projects, measures, or processes that Corozal will adopt in order to reduce or eliminate risk to people and property from hazards. Consequently, Corozal reviewed and revised the criteria adopted in the 2020 LHMP to analyze and prioritize potential mitigation strategies for the municipality. To develop the actions, the Planning Committee used the following criteria: (1) the potential of the strategy to reduce expected future damages and/or losses; (2) the capacity of the municipality to implement the action within the 5-year cycle of the Plan; (3) support from the public, agencies, municipal departments, amongst others; and (4) the potential of the action to increase resiliency of Corozal and its residents. Accordingly, the Planning Committee adopted these criteria, the results from the risk assessment, and the feedback from local and neighboring communities to prioritize each mitigation strategy that was contained in this LHMP.

The following summarizes some of the strategies intended to mitigate these hazards:

- Promoting the purchase of NFIP insurance in flood prone areas.
- Creating and keeping up to date a digital, georeferenced inventory using a geographic information system (GIS) of the critical and governmental infrastructure, as well as identified vulnerable areas.
- Continue evaluating the need for structural and non-structural mitigation actions to protect critical and governmental facilities from the threat of strong winds and rain (storm surge).

## 6 Maintenance to Keep the Plan Current

Chapter 7 details the revision and monitoring process in great extent. The formal maintenance process, identified by the Planning Committee, aims to keep the document viable and current, as it is a living document that shall reflect the hazards and realities affecting its community, and how to plan and prepare ahead in the event of a natural disaster. The Plan maintenance process provides the procedures for evaluation and review every year during its 5-year life cycle. Evaluation will include a review of the mitigation action plan implementation, continued public involvement through the Plan’s life cycle, as required by federal legislation. As part of the review process, the members of the Planning Committee. In the event of a major natural disaster affecting the island and/or municipality, an emergency meeting must be scheduled, and the Plan should be updated or amended, as necessary, bypassing the 5-year term. The Planning Office of the municipality will coordinate with other municipal dependencies, as needed, to achieve the goals and objectives stated in this LHMP.

Finally, the municipality will promote continued public participation during the plan maintenance by including but not limited to (Refer to Section 7.4 of the LHMP):

- Making sure to coordinate meetings between those involved in the Plan maintenance process, which will take place at the beginning of the third quarter of each fiscal year and after each natural disaster occurring in the jurisdiction of Corozal.
- Prepare the Reports of the Plan Progress Analysis, which will be presented and discussed in meetings with the people involved in the Plan maintenance process.
- Review whether there were changes in the Act, regulatory agency regulations, which affect the Plan in one way or another, as well as budget allocations that may affect the development of projects programmed for communities.
- Ensure that applications for funds for the development of the activities described in the Plan to be made by the municipality are included in the budget of the relevant fiscal year.
- Identify opportunities to access funds.
- Establish the program-specific Work Plan, based on the schedule and goals set out in the Plan.

## 7 Plan Approval and Adoption

The Federal Emergency Management Agency (FEMA) completed review of the Municipality of Corozal’s Local Hazard Mitigation Plan, based on the standards pursuant to title 44 C.F.R. Section 201 as authorized by the Disaster Mitigation Act of 2000 (DMA2k). Upon approval, the municipality becomes eligible for FEMA Hazard Mitigation Assistance programs.

The LHMP was adopted by the local government and was pre-approved by FEMA on July 8, 2024. The Municipality of Corozal adopted said Plan on July 24, via Executive Order 002 Series 2024-2025. Upon receiving the record of adoption from the municipality, FEMA issued a final plan approval letter dated August 21, 2024, confirming the municipality has adequately addressed the required local planning

elements. This approval lasts for a period of five (5) years from the date of initial approval, or through August 19,2029.