

PLANES DE MITIGACIÓN CONTRA PELIGROS NATURALES

Resiliencia Planificada



JUNTA DE PLANIFICACIÓN

2020

Municipality of Dorado

Natural Hazard Mitigation Plan

Executive Summary



1 Introduction

The municipality of Dorado has revised its Local Hazard Mitigation Plan (LHMP).¹ This complies 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.² 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 Dorado’s LHMP of 2020.

The municipality has also revised the LHMP under the authority of Act 81-1991, known as the Autonomous Municipalities Act of 1991, as amended. Section 2.004 of said 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.³

¹ Please note that the 2020 Revised HMP was written in Spanish as per agreement between the Municipality of Dorado, the Planning Board, the Governor’s Authorized Representative (GAR) and FEMA.

² 42 U.S.C 5165; 44 C.F.R. § 201.6.

³ 21 L.P.R.A § 4054

This Executive Summary will provide an overview on:

- Dorado’s population characteristics;
- The public participation and outreach efforts with the community during the LHMP planning process;
- Dorado’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 Dorado’s Profile: Main Population Characteristics



Figure 2: Dorado and its wards

Municipality located in Puerto Rico’s northern coast, on the western edge of the San Juan Metropolitan Area. It has an area of 23.09 square miles. It is bordered by the municipalities of Toa Baja to the East, Toa Alta to the South, and Vega Alta to the West.

The municipality is composed of six (6) *barrios* or wards: Dorado Pueblo, Espinosa, Higuillar, Maguayo, Mameyal, and Río Lajas.

Several rivers run through the municipality’s jurisdiction: La Plata, which makes up the Municipality’s eastern border, and its tributaries the Bucabarones and Lajas rivers, and the Índio and Cocal rivers. The most important is the La Plata river, which originates in the Cordillera Central and flows northward to the Atlantic Ocean. Other bodies of water found in the municipality are the Mata Redonda lagoon in the northwest and the Ciénaga

Prieta marsh just south of the lagoon.

Table 1: Population by age group: 2010 and 2017

Population	2010 Census	2017 ACS estimate	% Rate of Change
Younger than 5 years age	2,535	1,988	-21.58%
5 to 19 years of age	8,581	7,896	-7.98%
20 to 64 years of age	22,431	21,954	-2.13%
65 years of age and older	4,618	5,884	27.41%
Total	38,165	37,722	-1.16%

Source: US Census Bureau, Census 2010; American Community Survey 2013-2017 Estimates

According to the 2010 Census, Dorado had a population of 38,165. The American Community Survey (ACS) of 2017 estimated that the population of Dorado had decreased to 37,722 inhabitants. This represents a reduction of 1.16%. Regardless of this overall reduction, two of the six wards that make up the Municipality were

estimated to have had an increase in their population. According to the 2017 ACS, Mameyal Ward was unpopulated; however, the Planning Office points out that there are a few families living in this ward in unofficial communities. Further details, regarding the profile of the municipality, can be found in Chapter 3, Section 3.2 of the updated 2020 LHMP.

3 Outreach and Public Participation

In order to guide the development of this Plan, the Hon. Carlos A. López Rivera, Mayor of Dorado, appointed the following officials to constitute the Mitigation Planning Committee (henceforth, the Planning Committee). The Planning Committee is comprised by representatives from five (5) departments with key roles and experience in community planning, public works, and emergency management, to serve as key components in the planning process.

Table 2: Hazard Mitigation Planning Committee

Name	Position	Agency	Email
Alexis A. Ramos	Director	Municipal Planning and Territorial Office	alexis.ramos@dorado2025.com
Wadalberto Matos	Police Commissioner	Municipal Police	wadalberto.matos@dorado2025.com
Neftalí Fuentes	Faith and Community Liaison	Municipality of Dorado	neftali.fuentes@dorado2025.com
Wigberto Vega	Director	Municipal Public Works Office	wigberto.vega@dorado2025.com
Orlando Vargas	Municipal Administrator	Municipality of Dorado	orlando.vargas@dorado2025.com
Roberto Ramos	Director	Municipal Federal Programs Office	roberto.ramos@dorado2025.com
Luis R. Sierra	Director	Finance Office	luis.sierra@dorado2025.com
Ianna Martínez	Consultant	Municipality of Dorado	interviron@gmail.com
Eliezer González	Director	Municipal Emergency Management Office	eliezer.gonzalez@dorado2025.com

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 2020 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 Dorado LHMP 2020 draft version and incorporate such comments on the Plan.

On April 26, 2019, a notice was published on a local newspaper (Primera Hora) informing the public about the first Public Participation meeting to be held in Dorado. On June 7, 2019, a second notice was published

regarding the publication of the 2020 LHMP draft version for review providing 20 days period for review, submit comments, and the opportunity to participate in a second community meeting. A draft version of the 2020 LHMP was made available on the Puerto Rico Planning Board’s (PRPB) website (jp.pr.gov), while a hard copy was made available at the Municipal Planning and Territorial Office for public review from 8:00 am to 4:00 pm on weekdays.

4 Dorado’s Risk Assessment

After reviewing the natural hazards identified as priorities on Dorado’s previous 2013 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 2020 LHMP; (1) Sea Level Rise, (2) Drought, (3) Earthquakes, (4) Flooding, (5) Landslides, (6) Strong Winds (Tropical Cyclones), (7) Tsunami (8) Coastal Erosion, (9) Storm Surge, and (10) Wild Fire. Discussion of these natural hazards are included in the 2020 LHMP’s Chapter 4. In addition, the 2020 LHMP includes a quantitative vulnerability analysis based on the best available data for Dorado 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 earthquake, flood, 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 2020 LHMP technical risk assessment along with a capability gap analysis and local community input, which is based on previous natural events experienced by the Planning Committee and the residents and business owners of Dorado.

The following table (Table 3) provides a summary of the risk classification for each identified hazard. Part of the process of completing the following 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
Sea Level Rise	Moderate	Low	Low	Low
Drought	Moderate	Low	Low	Low
Earthquake/Liquefaction	High	High	High	High
Flooding	High	Moderate	Low	Moderate

Natural Hazard	Risk to people	Risk to facilities	Risk to operations	Classification
Landslide	Moderate	Low	Low	Low
Strong Winds/Tropical Cyclones	High	Moderate	High	High
Tsunami	High	Low	Moderate	Moderate
Storm Surge	Moderate	Low	Low	Low
Coastal Erosion	Low	Low	Low	Low
Wildfire	Low	Low	Low	Low

Source: Planning Committee 2019-2020

Currently, the potential risks with the highest classification or greater impact identified for the municipality are: (1) earthquake/liquefaction and (2) strong winds.

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 most mitigation actions is “Property Protection” with a total of 27 mitigation projects. Landslide and flooding 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 amount of local goals and strategies. The local mitigation actions were gathered from the 2013 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 Dorado wants to achieve in terms of hazards and mitigation. Thus, the goals included in the 2020 LHMP offer the Planning Committee and the communities a framework for identifying, prioritizing and implementing actions to reduce the risks associated with natural hazards in Dorado.

Mitigation strategies are activities, projects, measures, or processes that Dorado will adopt in order to reduce or eliminate risk to people and property from hazards. Consequently, Dorado reviewed and revised the criteria adopted in the 2013 LHMP to analyze and prioritize potential mitigation strategies for the municipality. In order to developed 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 for Dorado 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.

Most of the strategies and projects in the action plan target the continuity of municipality services after a hazard event. The following summarizes some of the strategies intended to mitigate these hazards:

- Acquisition and demolition of two residential structures in Calle 4 of the Maguayo ward, in order to return the land to its natural state for mitigation purposes.
- Design and construction of retention ponds around the Municipality to help with flooding issues in certain communities.
- Construction of underwater breakwaters to ease erosion concerns in the fishing village, in order to safeguard its economic and historical wellbeing.
- Design and construction of vertical evacuation building along the coast to serve as emergency shelters in case of a tsunami.
- Design and construction of safe rooms around the municipality in shelters to help the residents in strong wind (tropical cyclone) events.

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 biannually 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. 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 Municipal Administrator 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;

- Regularly surveying the public on perceived hazards, dangers and mitigation actions in the municipality.
- Placing a copy for public review every time a progress report on the LHMP is prepared.
- Providing regular presentations to community groups regarding the content and progress of the LHMP.
- Having a robust education program regarding the NFIP program and NFIP recommendations.

7 Plan Approval and Adoption

The Federal Emergency Management Agency (FEMA) completed review of the Municipality of Dorado's 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). The Plan received a satisfactory rating for all required criteria and was approved as approvable pending adoption (APA) on August 31, 2020. Accordingly, the Municipality of Dorado adopted said Plan on September 10, 2020 via Executive Order No. 02, Series 2020-2021.

Upon receiving the record of adoption from the municipality, FEMA approved the Plan on September 14, 2020 and issued an official approval letter to municipality that dated September 17, 2020 stating the jurisdiction has adopted said Plan thus approved and eligible for FEMA Hazard Mitigation Assistance programs. The approval letter establishes the expiration date 5 years from the date of approval, or until September 13, 2025.