

PLANES DE MITIGACIÓN CONTRA PELIGROS NATURALES

Resiliencia Planificada



JUNTA DE PLANIFICACIÓN

2020

# Municipality of Guayama

Natural Hazard Mitigation Plan

Executive Summary

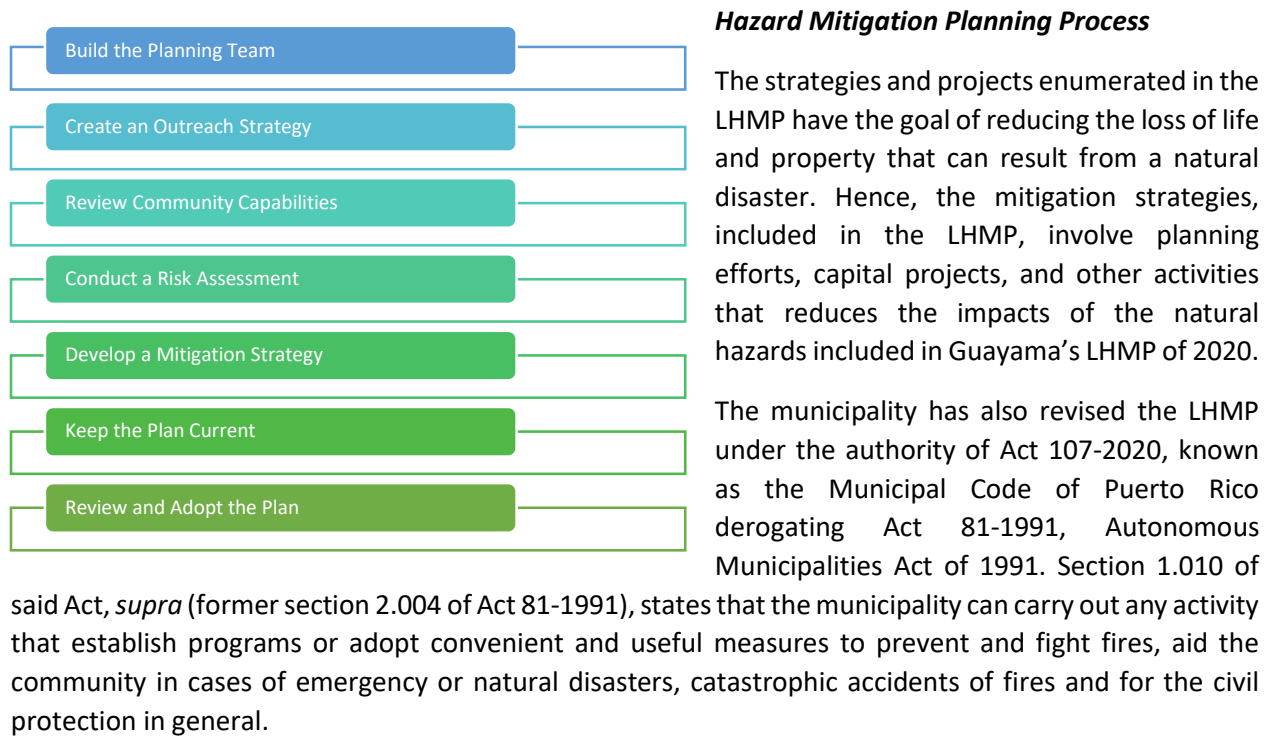


# 1 Introduction

The Municipality of Guayama 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



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

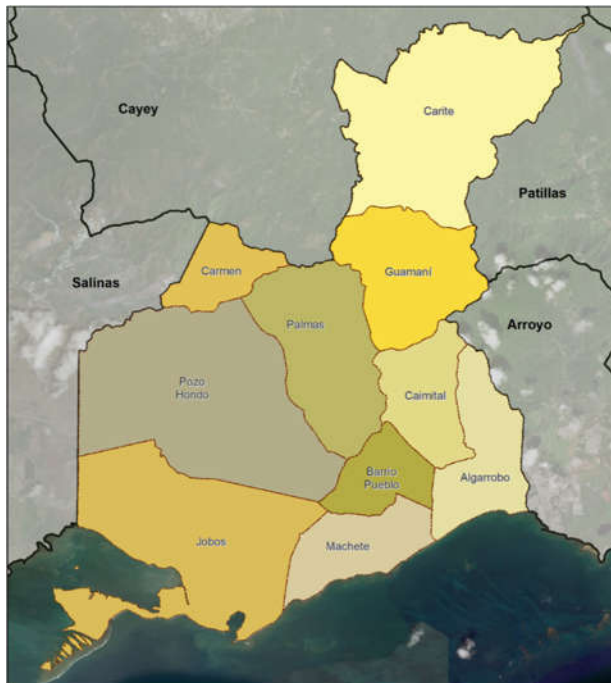
<sup>2</sup> 42 U.S.C 5165; 44 C.F.R. § 201.6.

This Executive Summary will provide an overview on:

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

Figure 1: Guayama and its wards



The Municipality of Guayama is located on the southern coast of Puerto Rico, adjacent to the municipalities of Salinas to the west, Cayey to the north, Arroyo to the east, Patillas to the northeast, and the Caribbean Sea in the south. Due to its geographical location, the municipality is part of the Southern Region, as delimited by the Planning Board. 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 Guayama belongs to the Functional Area of Guayama, which is composed of the municipalities of four (4) municipalities, that is: Guayama, Arroyo, Patillas, and Salinas.

Source: Puerto Rico Planning Board, 2019

The municipality has ten (10) official “barrios” or wards: (1) Algarrobo; (2) Caimital; (3) Carite; (4) Carmen; (5) Guamaní; (6) Jobos; (7) Machete; (8) Palmas; (9) Pozo Hondo; and (10) Pueblo.

Table 1: Population by age group: 2010 and 2018

Population	2010 Census	2018 ACS Estimate	% Rate of Change
Younger than 5 years age	2,826	1,905	-32.59%
5 to 19 years of age	10,201	8,194	-19.67%
20 to 64 years of age	26,727	24,634	-7.83%
65 years of age and older	5,608	6,973	24.34%
<b>Total</b>	<b>45,362</b>	<b>41,706</b>	<b>-8.06%</b>

Source: US Census Bureau, Census 2010; American Community Survey 2014-2018 Estimates

According to the 2010 Census, Guayama has a population of 45,362. The American Community Survey (ACS) of 2018 estimated that the population of Guayama had decreased to 41,706. This represents a reduction of 8.06%. Most of its barrios reflected a reduction, except for Carite (2.23%) and Carmen (2.10%), for a total of 3,656 inhabitants.

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, Eduardo E. Cintrón Suárez, Mayor of Guayama, appointed the following officials to constitute the Mitigation Planning Committee (henceforth, the Planning Committee). The Planning Committee is comprised by representatives from several dependencies 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	E-mail
Eduardo E. Cintrón Suárez	Mayor	Municipality of Guayama	eduardoecintron@yahoo.com
Eddie A. Vázquez	Interim Director	OMMEAD Oficina Municipal de Manejo de Emergencias (Emergency Management)	eddie4026@gmail.com
Ing. Juan Ortiz Conesa	Director	Oficina de Gerencia de Proyectos (Project Management Office)	jortizmunicipiodeguayama@gmail.com
Ramón Conde	Director	Obras Públicas Municipal (Municipal Public Works)	ramconde1@hotmail.com
William Martínez	Commissioner	Policía Municipal (Municipal Police)	wmartinez@municipiodeguayamapr.com
Arnaldo Rodríguez	Director	Programas Federales (Federal Programs)	arodriguezdroz@gmail.com
Vilmarie Fuentes	Director	Oficina de Gerencia y Presupuesto	vilmar26@hotmail.com

		(Management and Budget)	
Liliam Rodríguez	Director	Oficina de Finanzas (Finances Office)	ldr.l.rodriguez@gmail.com
O'brain Vázquez Molina	Director	Oficina de Ayuda al Ciudadano (Support to Citizens)	obrainvazquezmolina@yahoo.com
Raúl Torres	Consultant	Planning	planificadortorres@yahoo.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 Guayama's 2020 LHMP draft version and incorporate such comments on the Plan.

An initial notice was published on a local newspaper (Primera Hora) on June 23, 2020. Said notice informed the public about the first Public Participation meeting to be held on July 8, 2020 virtually via YouTube (<https://youtu.be/YimF-56sRpA>). A second notice was published on September 22, 2020 regarding the publication of the 2020 LHMP draft version for review providing a 25-day period for review, submit comments, and the opportunity to participate in a second community meeting held on October 7, 2020 virtually via YouTube (<https://youtu.be/QkBwPRlcewU>). Said notice was also published on their official webpage (<http://www.viveelencanto.com/index.php>). A draft version of the 2020 LHMP was made available on the Puerto Rico Planning Board's (PRPB) website ([jp.pr.gov](http://jp.pr.gov)), as well as the municipalities webpage.

#### 4 Guayama's Risk Assessment

After reviewing the natural hazards identified as priorities on the previous Guayama's 2014 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 Fires. A discussion of these natural hazards is 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 Guayama 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 the local community input, which is based on previous natural events experienced by the Planning Committee and the residents and business owners of Guayama.

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
Sea Level Rise	High	Low	Low	Moderate
Drought	High	Moderate	Moderate	High
Earthquake/Liquefaction	High	High	High	High
Flooding	High	Moderate	Moderate	High
Landslide	Moderate	Low	Low	Moderate
Strong Winds/Tropical Cyclones	High	High	High	High
Tsunami	High	Low	Moderate	Moderate
Storm Surge	High	Low	Low	Moderate
Coastal Erosion	High	Low	Low	Moderate
Wildfire	Low	Low	Low	Low

Source: *Planning Committee 2020-2021*

Currently, the potential risks with the highest classification or greater impact identified for the municipality are: (1) Sea Level Rise, (2) Drought, (3) Earthquake/Liquefaction, (4) Flooding, (5) Landslides, (6) Strong Winds, (7) Tsunami, (8) Storm Surge, and (9) Coastal Erosion.

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 “Prevention” with a total of 16 mitigation projects, followed by “Property Protection” with a total of 12 mitigation projects.

## 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 2014 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 Guayama 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 to natural hazards at Guayama.

Mitigation strategies are activities, projects, measures, or processes that Guayama will adopt in order to reduce or eliminate risk to people and property from hazards. Consequently, Guayama reviewed and revised the criteria adopted in the 2014 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 of Guayama 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 (Refer to Section 6.5 of the LHMP):

- NFIP Insurance;
- Inventory of critical facilities to prepare for strong winds events;
- Inventory of occurrence of forest fires in the municipality;
- Habilitate sismo-resistant structures (public schools) and, or reinforce those that require so;
- Climate change studies;
- Electrical Grid/Systems works & improvement;
- Seawall works & improvement;
- Flood prevention and control & Coastal protection;
- Acquisition and relocation of families in flooding zones.
- Incrementing personnel for emergency response;
- Community training for emergency response and natural hazard awareness;
- Providing educational campaigns to educate communities against natural hazard awareness, response and preparedness;
- Hazard Mitigation Plan Maintenance

## 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 third quarter of each fiscal 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 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, including, but not limited to (Refer to Sections 7.4 and 7.7 of the LHMP) in accordance to the 2021-2026 Calendar:

- 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 Guayama.
- Prepare the Work Plan and assign responsibilities for the Evaluation and Plan Update to take place within 60 days of that first meeting.
- 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.
- In coordination with the Mayor's Office, 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.
- In coordination with the Municipal Department of Public Works to achieve the implementation of the projects set out in the Plan.
- 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 Guayama'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 March 10, 2021. Accordingly, the Municipality of Guayama, adopted said Plan on May 3, 2021 via Resolution No. 37, Series 2020-2021.

Upon receiving the record of adoption from the municipality, FEMA approved Plan by May 17, 2021 and issued an official approval letter to municipality 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 May 16, 2026.