PLANES DE MITIGACIÓN CONTRA PELIGROS NATURALES

Resiliencia Planificada

JUNTA DE PLANIFICACIÓN

2021
Municipality of Lajas

Natural Hazard Mitigation Plan

Executive Summary

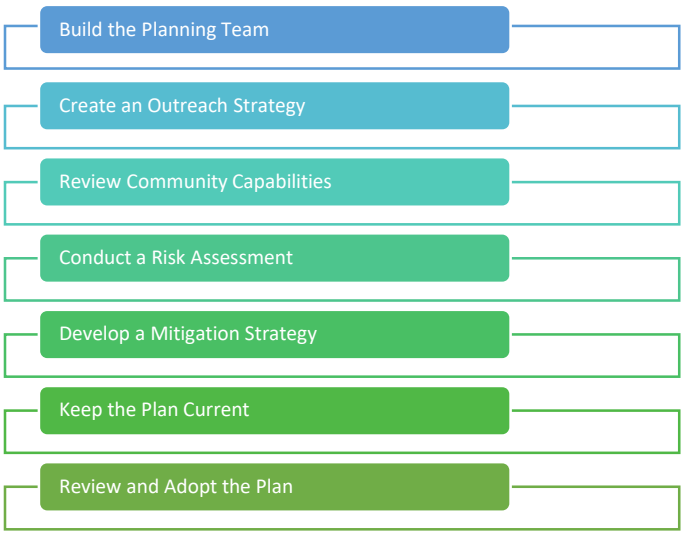
CUIDAD CARDENALICIA

1 Introduction

The Municipality of Lajas has revised its Local Hazard Mitigation Plan (LHMP)[1] 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.[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 Lajas's LHMP of 2021.

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.

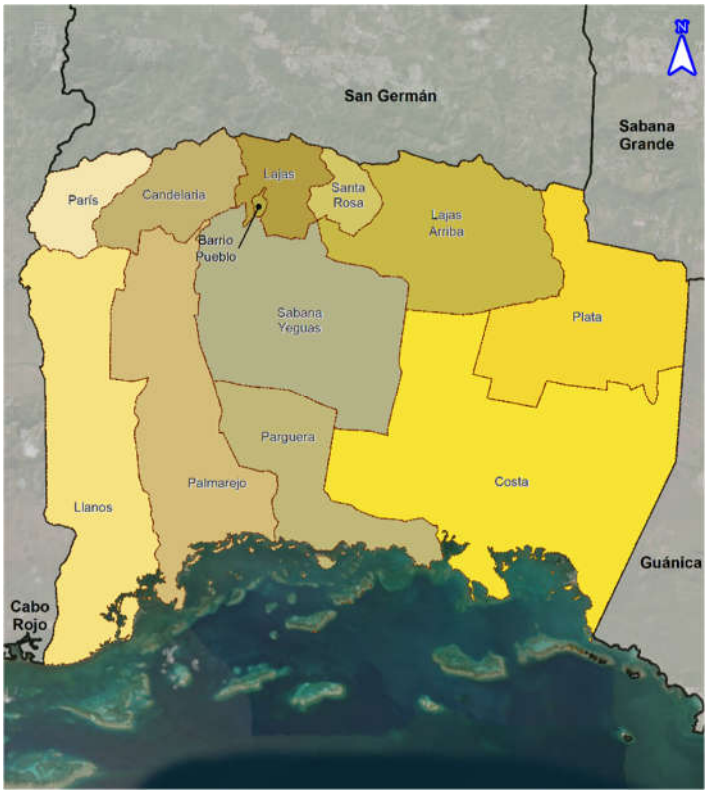
[1] Please note that the 2021 Revised HMP was written in Spanish as per agreement between the Municipality, the Planning Board, the Governor's Authorized Representative (GAR) and FEMA.
[2] 42 U.S.C 5165; 44 C.F.R. § 201.6.

This Executive Summary will provide an overview on:

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

Figure 2: Lajas and its wards



The Municipality of Lajas is located in the southwest of Puerto Rico. Its northern border is the municipalities of San Germán and Sabana Grande, to the west is the Municipality of Cabo Rojo, to the east is the Municipality of Guánica and to the south is the Caribbean Sea. The Municipality of Lajas has a territorial area of approximately 77 square miles (200 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 Functional Area of Mayagüez, to which the Municipality of Lajas belongs, is composed of the municipalities of Añasco, Cabo Rojo, Hormigueros, Lajas, Las Marías, Maricao, Mayagüez, Rincón, Sabana Grande and San Germán.

The municipality has twelve (12) official *barrios* or wards: Candelaria, Costa, Lajas, Pueblo, Lajas Arriba, Llanos, Palmarejo, Parguera, París, Plata, Sabana Llegua and Santa Rosa.

In hydrographic terms, the Municipality of Lajas is known for being extremely arid and possessing a dearth of natural water sources, leading to the lack of above ground water features such as rivers or creeks. While there are subterranean water sources, these are used in limited circumstances; water for domestic and agricultural use is brought over from other parts of the island through the use of extensive public aqueducts, including the Valle de Lajas project of canals and tunnels for water distribution.

Table 1: Population by age group: 2010 and 2018

Population	2010 Census	2018 ACS estimate	% Rate of Change
Younger than 5 years age	1,492	1,068	-28.42%
5 to 19 years of age	5,220	4,269	-18.22%
20 to 64 years of age	14,565	13,346	-8.37%
65 years of age and older	4,476	5,210	16.40%
Total	**25,753**	**23,893**	**-7.22%**

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

According to the 2010 Census, Lajas has a population of 25,753. The American Community Survey (ACS) of 2017 estimated that the population of Lajas had decreased by 1,860 inhabitants. This represents a reduction of 7.22%. Half of the wards of the municipality experienced a reduction in population, with the highest in percentage terms being Parguera, with a 48.61% reduction (2,082 to 1,070 inhabitants). The remaining six (6) wards experienced population increases, with the largest in percentage terms being Lajas, with a 19.82% increase in population (2,694 to 3,228 inhabitants). Further details regarding the profile of the municipality can be found in Chapter 3, Section 3.2, of the updated 2021 LHMP.

3 Outreach and Public Participation

In order to guide the development of this Plan, Hon. Marcos Arturo Irizarry Pagán, Mayor of Lajas, appointed the following officials to constitute the Mitigation Planning Committee (henceforth, the Planning Committee). The Planning Committee is comprised by representatives from several departments and citizen involvement 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 for more information.

Table 2: Hazard Mitigation Planning Committee

Name	Position	Agency	eMail
Carlos N. López Robles	Director	Municipal Planning Office	planificacionlajas@gmail.com
Víctor Pacheco Santiago	Interim Director	Municipal Emergency Management Office	ommelajas@gmail.com
Alfredo Lugo Carlo	Interim Director	Municipal Public Works	obraspublicaslajas@gmail.com
Myrta L. Rodriguez Piñeiro	Director	Municipal Finance Office	finanzaslajas@gmail.com
José Carlos Ramírez López	Director	Municipal Federal Programs Office	contabilidadlajas@gmail.com
Marilyn Padilla Hernández	Municipal Secretary	Municipality of Lajas	seretariamunicipallajas@gmail.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 2021 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 Lajas's LHMP 2021 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 Lajas on December 18, 2019. A second notice was published regarding the publication of the 2021 LHMP draft version for review providing 20 days period for review, submit comments, and the opportunity to participate in a second community meeting held on July 24, 2020. A draft version of the 2021 LHMP was made available on the Puerto Rico Planning Board's (PRPB) website (jp.pr.gov).

4 Lajas's Risk Assessment

After reviewing the natural hazards identified as priorities on the previous Lajas'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 2021 LHMP; (1) Sea Level Rise, (2) Drought, (3) Earthquakes, (4) Flooding, (5) Landslides, (6) Strong Winds (Tropical Cyclones), (7) Tsunami, (8) Storm Surge, (9) Coastal Erosion and (10) Wildfire. Discussion of these natural hazards are included in the 2021 LHMP's Chapter 4. In addition, the 2021 LHMP includes a quantitative vulnerability analysis based on the best available data for Lajas 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 2021 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 Lajas.

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	2	1	1	Low

Natural Hazard	Risk to people	Risk to facilities	Risk to operations	Classification
Drought	2	1	2	Moderate
Earthquake/Liquefaction	3	3	3	High
Flooding	3	2	2	High
Landslide	2	1	1	Low
Strong Winds/Tropical Cyclones	3	3	3	High
Tsunami	3	2	2	High
Storm Surge	3	1	1	Moderate
Coastal Erosion	3	1	1	Moderate
Wildfire	3	1	1	Moderate

Source: Planning Committee 2020 *High=3, Moderate=2, Low=1*

Currently, the potential risks with the highest classification or greater impact identified for the municipality are: (1) earthquake, (2) flooding, (3) strong winds/tropical cyclone, and (4) tsunami.

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 21 mitigation projects. Flooding, strong winds and earthquakes 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 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 Lajas wants to achieve in terms of hazards and mitigation. Thus, the goals included in the 2021 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 Lajas.

Mitigation strategies are activities, projects, measures, or processes that Lajas will adopt in order to reduce or eliminate risk to people and property from hazards. Consequently, Lajas reviewed and revised the criteria adopted in the 2014 LHMP to analyze and prioritize potential mitigation strategies for the

municipality. In order 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 Lajas 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:

- Determine the earthquake resistance of school buildings built before 1987, in order to reinforce those that are not compliant.
- Development of a water resource management plan that aims to increase available water resources in case of drought.
- Purchase of land for relocation of families from risk prone areas.
- Plant vegetation that contributes to soil retention, as well as installation of netting and other structural elements, to protect against landslide and coastal erosion.
- Cleaning and maintenance of existing drainage systems to prevent these from backing up during heavy rains and contributing to flooding.
- Rebuild/refit bridges to allow access to communities in case of hazard events such as flooding/landslide/earthquake.

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 Committee 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 each year and after each natural disaster occurring in the jurisdiction of Lajas.
- 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 Lajas'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 December 23, 2020. Accordingly, the Municipality of Lajas, adopted said Plan on January 15, 2021 via Executive Order 24, Series 2020-2021.

Upon receiving the record of adoption from the municipality, FEMA approved Plan by February 5, 2021 and issued an official approval letter to the municipality stating the jurisdiction has adopted said Plan and is 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 February 4, 2026.