

**Better solutions.
Fewer disasters.
Safer world.**



Madriz

**Nicaragua National Disaster Preparedness Baseline Assessment
Department Profile**

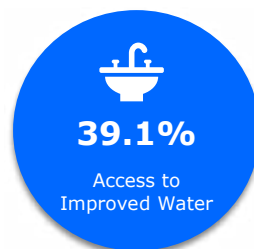
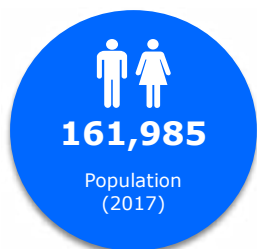
Department: Madriz



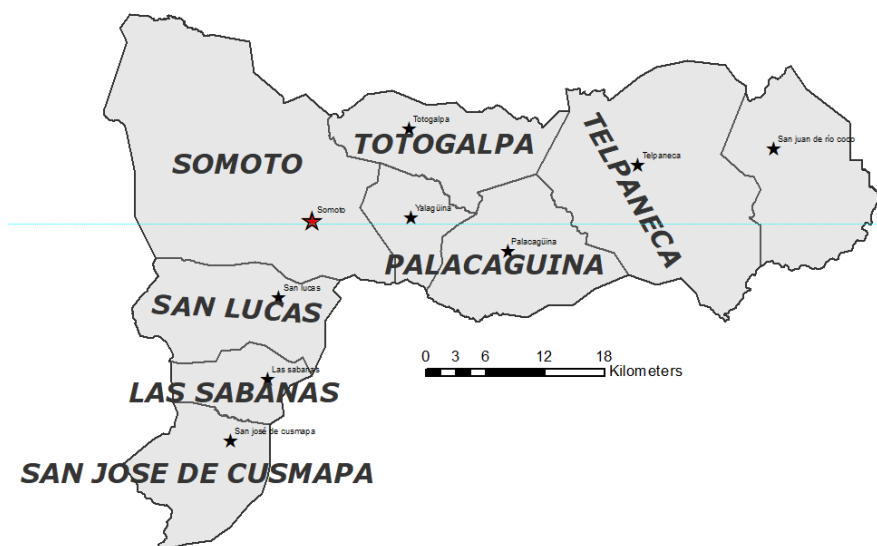
Department Capital: Somoto

Area: 1,708 km²

Madriz is a small province located on the northern border of Nicaragua. Madriz is known for its pine and oak forests, coffee plantations, and artisanal handicrafts.



Municipality	Population
Somoto	38,582
Totogalpa	15,406
Telpaneca	23,075
San Juan de Río Coco	28,205
Coco	28,205
Palacagüina	15,539
Yalagüina	12,450
San Lucas	15,598
Las Sabanas	5,071
San José de Cusmapa	8,059



Multi-Hazard Risk Rank: Low (14 of 17)

Lack of Resilience Rank: High (6 of 17)

RVA Component Scores

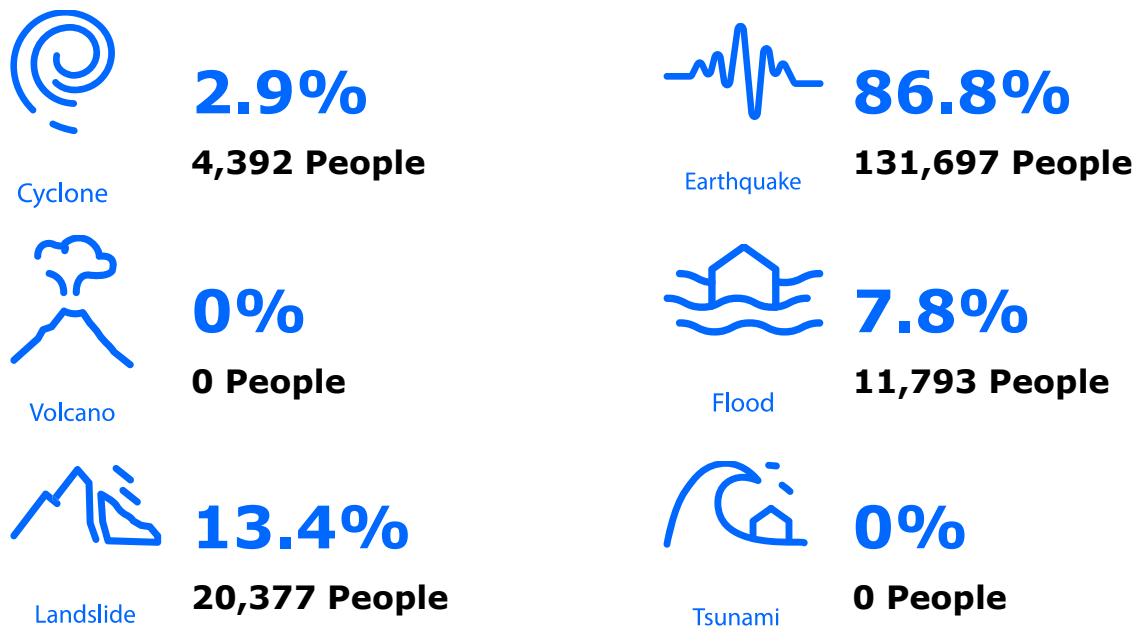
Table 1. Department scores and ranks (compared across departments) for each index

Multi-Hazard Risk		Lack of Resilience		Multi-Hazard Exposure		Vulnerability		Coping Capacity	
Low		High		Very Low		High		Low	
Score	Rank (of 17)	Score	Rank (of 17)	Score	Rank (of 17)	Score	Rank (of 17)	Score	Rank (of 17)
0.433	14	0.568	6	0.164	16	0.558	5	0.421	12

Multi-Hazard Exposure (MHE)

Multi-Hazard Exposure¹ Rank: 16 of 17 Departments (Score: 0.164)

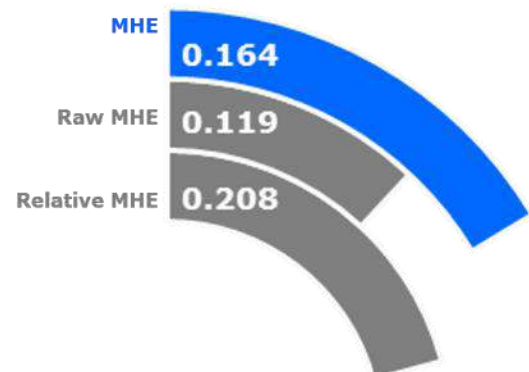
Table 2. Estimated ambient population² exposed to each hazard



Case Study: Food Security in Madriz

Heifer International is working with local farmers to increase food security and climate change resilience. Thirty-eight cooperatives are working with Heifer to restore their main livelihood, coffee and food production, and rehabilitate 2,387 acres of farmland. The overall goal of the project is to strengthen food security and increase the household incomes of small farmers.

<https://www.ngoaidmap.org/projects/5043>



¹ Multi-Hazard Exposure: Average exposure of the population to hazards.

² Ambient Population: 24-hour average estimate of the population in each department. Ambient population typically differs from census population.

Vulnerability (V)

Vulnerability³ Rank: 5 of 17 Departments (Score: 0.558) Vulnerability in Madriz is primarily driven by high Environmental Stress and Clean Water Vulnerability. The bar chart on the right indicates the socioeconomic themes contributing to the department's overall Vulnerability score.

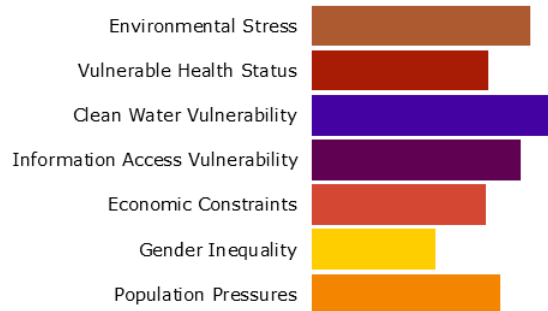


Table 3. Component scores for each vulnerability sub-component

	Environmental Stress	91.4% Province at Drought Risk	64.5% Erosion Risk	58.8 Livestock per km ²			
	Vulnerable Health Status	13.0 Infant Mortality Rate	66.6 Maternal Mortality Rate	71.2 yrs Average Life Expectancy	0.8% Acute Malnutrition (Children <5)	3.0% Population Disabled	
	Clean Water Vulnerability	39.1% Households with Access to Improved Water	19.4% Households with Access to Flush Toilets				
	Information Access Vulnerability	30.2% Illiteracy	5.1 yrs Average Years of Schooling	82.3% Primary School Enrollment	95.7% Households without Internet	46.8% Households without TV	44.0% Households without Radio
	Economic Constraints	61.7 Economic Dependency Ratio	74.2% Population in Poverty				
	Gender Inequality	50.0% Female Seats in Government	1.06 Female to Male Secondary Education Enrollment	0.54 Female to Male Labor Ratio			
	Population Pressures	2.39% Average Annual Population Change	3.16% Average Annual Urban Population Change				

³ **Vulnerability:** The socioeconomic conditions that are associated with the susceptibility to disruptions in a country's normal functions.

Coping Capacity (CC)

Coping Capacity⁴ Rank: 12 of 17 Departments (Score: 0.421) Madriz exhibits weaker Coping Capacity in the areas of Economic Capacity, Environmental Capacity, and Infrastructure. The bar chart on the right indicates the socioeconomic themes contributing to the department's overall Coping Capacity score.

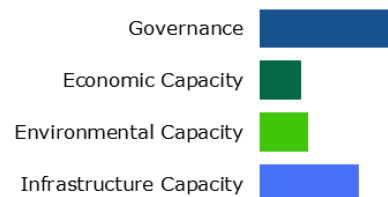


Table 4. Component scores for each coping capacity sub-component

	Economic Capacity	3.8% Households that Receive Remittances	82.4% Employment Rate (Male)	38.1% Employment Rate (Female)	10.2% Population in Highest Welfare Quintile	\$295.1 Annual Nominal Global Revenue per Capita	
	Governance	94.2% Crime Complaints Cleared	807.2 Crime Rate per 100k Persons	90.5% Households without Garbage Collection	48.1% Voter Participation (2016 Election)		
	Environmental Capacity	14.1% Protected or Reforested Land					
	Infrastructure Capacity						
	Health Care Capacity		8.9 Hospital Beds per 10,000 Persons	14.7 Nurses per 10,000 Persons	9.0 Physicians per 10,000 Persons	11.1 km Average Distance to Nearest Hospital	90.1% Children Completed Immunization Schedule
	Communications Capacity		7.6% Households with Access to Fixed Phone Line	60.7% Households with Access to Mobile Phone			
	Transportation Capacity		111.7 km Average Distance to Nearest Port or Airport	0.68 km Total Length of Road per km ² (area)			

⁴ Coping Capacity: The systems, means, and abilities of a country to absorb and respond to events that could potentially disrupt normal function.

Lack of Resilience (LR)

Lack of Resilience⁵ Rank: 6 of 17 Departments (Score: 0.568)

Madriz's score and ranking are due to high Vulnerability combined with low Coping Capacity scores.

Table 5. The three thematic areas with the weakest relative scores



Economic Capacity



Infrastructure Capacity



Clean Water Vulnerability

Multi-Hazard Risk (MHR)

Multi-Hazard Risk⁶ Rank: 14 of 17 Departments (Score: 0.433)

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

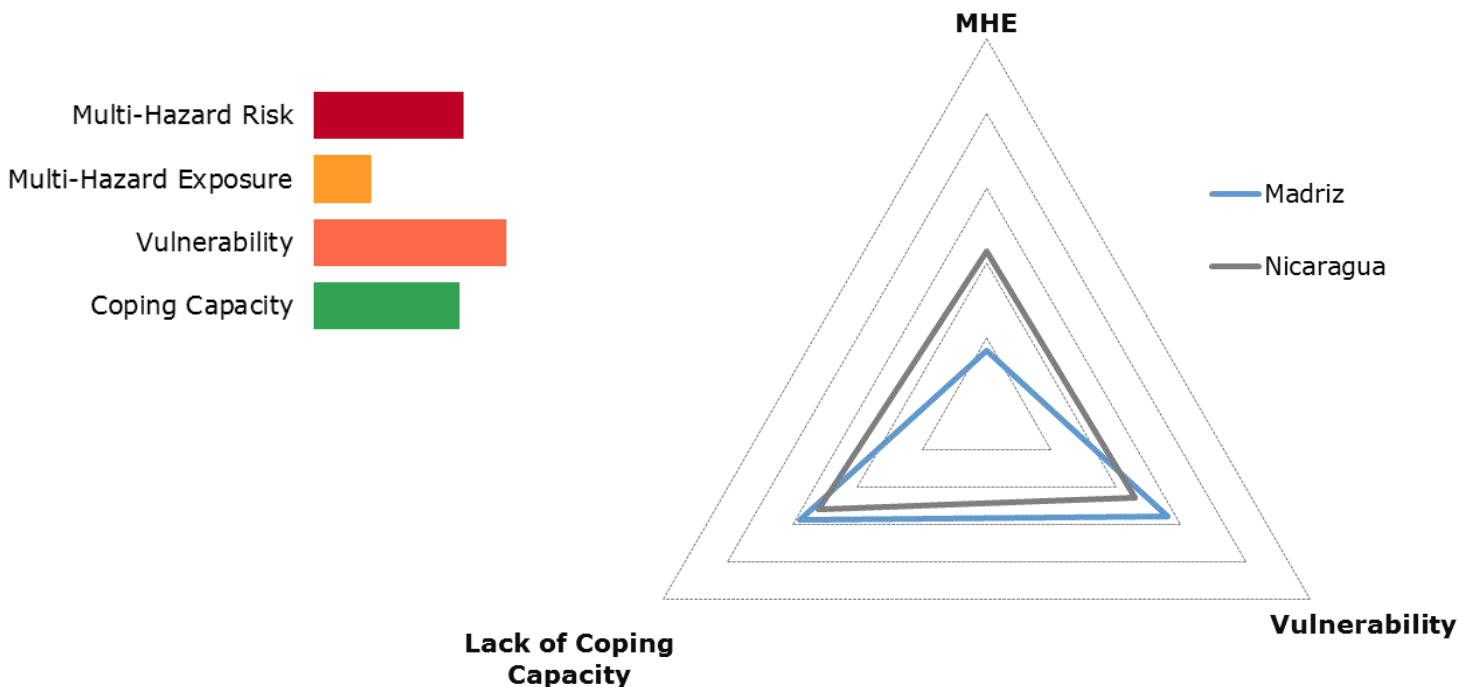


Figure 1. Department Multi-Hazard Risk component scores compared to overall average country scores

⁵ **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 socioeconomic conditions.

⁶ **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 5 of 17 departments, high health care capacity indicates that the population will have access to healthcare services before, during, and after a disaster.



High overall governance

Ranked 6 of 17 departments, high governance could facilitate the implementation of disaster management initiatives into departmental and municipal communities.

Recommendations

01

Increase economic capacity

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

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 in Madriz. Health care, transportation, and communication infrastructures require upgrading and investment to increase connectivity and welfare in the department. Focused investments in these areas will increase coping capacity and resilience.

03

Reduce clean water vulnerability

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



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