PERU

NATIONAL DISASTER PREPAREDNESS BASELINE ASSESSMENT

PACIFIC DISASTER CENTER

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- Ministerio de Defensa

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- Ministerio de Educación
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- Ministerio de Relaciones Exteriores
- Ministerio de Salud
- Ministerio de Trabajo y Promoción del Empleo
- Ministerio de Transportes y Comunicaciones
- Ministerio de Vivienda Construcción y Saneamiento
- Municipalidad Metropolitana de Lima
- Office of United States Foreign Disaster Assistance
- Oficina General de Defensa Nacional
- Oikos
- Organismo de Formalización de la Propiedad Informal
- Pan American Development Foundation
- Pan American Health Organization
- Peruvian Red Cross
- Petroleos del Peru
- Poder Judicial del Peru
- Policía Nacional del Peru
- Pontificia Universidad Católica del Peru
- Portal del Ministerio de la Producción
- Red de Fondos Ambientales de Latinoamérica y el Caribe
- Red de Información Humanitaria
- Región del Callao
- Save The Children
- Seguridad y Defensa Nacional
- Seguro Social de Salud
- Servicio Nacional de Búsqueda y Salvamento Terrestre
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- World Bank
- World Food Programme
- World Vision

Acronyms

AECID	Agencia Española de Cooperación Internacional para el Desarrollo Spanish Agency for International Cooperation
ANA	[CENEPRED] Autoridad Nacional del Agua National Water Authority
APEC	Asia-Pacific Economic Cooperation
ASPEm	Asociación Solidaridad Países Emergentes Emerging Countries Solidarity Association
CAF	Corporación Andina de Fomento / Banco de Desarrollo de América Latina Latin America Development Bank
CAPRADE	Comité Andino para la Prevención y Atención de Desastres Andean Committee for Disaster Prevention and Response
CARE	Cooperative for Assistance and Relief Everywhere
CC	Coping Capacity
CDM	Comprehensive Disaster Management
CENEPRED	Centro Nacional de Estimación, Prevención y Reducción del Riesgo de Desastres National Center for Estimating, Prevention, and Reduction of Disaster Risk
CEPLAN	Centro Nacional de Planeamiento Estratégico National Center for Strategic Planning
CMPAD	Comisión Multisectorial de Prevención y Atención de Desastres Multisectorial Commission for the Prevention and Attention to Disasters
COED	Centros de Operaciones de Emergencia Distrital District Emergency Operations Centers
COEL	Centros de Operaciones de Emergencia Local Local Emergency Operations Centers
COEN	Centro de Operaciones de Emergencia Nacional National Emergency Operations Center
COEP	Centro de Operaciones de Emergencia Provincial Provincial Emergency Operations Centers
COER	Centros de Operaciones de Emergencia Regional Regional Emergency Operations Centers
COES	Centros de Operaciones de Emergencia Sectorial Sectoral Emergency Operations Centers
CONAGERD	Consejo Nacional de Gestión del Riesgo de Desastres National Council of Disaster Risk Management
COOPI	Cooperazione Internazionale International Cooperation Foundation
COP	Common Operating Picture
DDI	[INDECI] Direcciones Desconcentradas INDECI (Decentralized Branches of INDECI for Regional and Local Disaster Risk Management)
DEFOCAPH	[INDECI] Dirección de Desarrollo y Fortalecimiento de Capacidades Humanas (Virtual Education Platform)
DHN	Dirección de Hidrografía y Navegación Directorate of Hydrography and Navigation
DIPECHO	Department of Humanitarian Aid and Civil Protection – European Commission

DIREH	[INDECI] Dirección de Rehabilitación del INDECI Rehabilitation Directorate of INDECI
DRR	Disaster Risk Reduction
EDAN	Evaluación de Daños y Análisis de Necesidades Damage Assessment and Needs Assessment
EOC	Emergency Operations Center
EPWG	[APEC] Emergency Preparedness Working Group
EU	Delegation of the European Commission
FAO	Food and Agriculture Organization of The United Nations
FONIE	El Fondo para la Inclusión Económica en Zonas Rurales Fund for Economic Inclusion in Rural Areas
FONIPREL	El Fondo de Promoción a la Inversión Pública Regional y Local Fund for the Promotion of Regional and Local Public Investment
GIRED	[INDECI] Grupo de Intervención Rápida para Emergencias y Desastres Rapid Intervention Group for Emergencies and Disasters
GIS	Geographic Information System
GRD	Gestión del Riesgo de Desastres Disaster Risk Management
GTZ	German Project Management Services
HAP	[USSOUTHCOM] Humanitarian Assistance Program
IFRC	International Red Cross and Red Crescent Federation
IGP	Instituto Geofísico del Peru Geophysical Institute of Peru
INEI	Instituto Nacional de Estadistica e Informatica (National Statistical System)
INGEMMET	Instituto Geológico, Minero y Metalúrgico Mining and Metallurgical Geological Institute
JICA	Japan International Cooperation Agency
JNE	Jurado Nacional de Elecciones National Election Jury
MEF	Ministerio de Economia y Finanzas Ministry of Economy and Finances
MHE	Multi-Hazard Exposure
MHR	Multi-Hazard Risk
MINEDU	Ministerio de Educación del Peru Ministry of Education
MININTER	Ministerio del Interior del Peru Ministry of the Interior
MINSA	Ministerio de Salud del Peru Ministry of Health
MTC	Missionary Training Center in Peru for the Church of Jesus Christ of Latter-Day Saints
MVCS	Ministerio de Vivienda Construcción y Saneamiento Ministry of Housing, Construction and Sanitation
NDPBA	National Disaster Preparedness Baseline Assessment
NGO	Non-Governmental Organization
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OFDA	Office of Foreign Disaster Assistance
OIM	Organización Internacional para las Migraciones

	International Organization for Migration
ONPE	Oficina Nacional de Procesos Electorales National Office of Electoral Processes
OPS/PAHO	Organización Panamericana de la Salud Pan American Health Organization
PCM	Presidencia del Consejo de Ministros Presidency of the Council of Ministers
PCS	[INDECI] Programa Ciudades Sostenibles Sustainable Cities Program (Sustainable Development Initiative)
PEI	Institutional Strategy Plan
PESPAD	[INDECI] Program de Educacion Superior en Preparación y Atención de Desastres (Higher Education Program in Disaster Preparedness and Care)
PIP	Public Investment Projects
PLANAGERD	Plan Nacional de Gestión del Riesgo de Desastres (National Plan for Disaster Risk Management)
PMA	Produce Marketing Association
POI	[IGN] Plan Operativo Institucional Institutional Operational Plan
PRONAA	Programa Nacional de Asistencia Alimentaria National Food Assistance Program
REDHUM	Red de Información Humanitaria para América Latina y el Caribe Humanitarian Information Network for Latin America and the Caribbean
RVA	Risk and Vulnerability Assessment
SCCP	[APEC] Sub-Committee on Customs and Procedures
SDC	Switzerland Agency for Development and Cooperation
SESPAD	[INDECI] Programo Servicio Escolar Solidario para la Preparación y Atención de Desastres (School Service Program in Disaster Preparedness and Care)
SINADECI	Sistema Nacional de Defensa Civil National Civil Defense System
SINAGERD	Sistema Nacional de Gestión del Riesgo de Desastres National System of Disaster Risk Management
SINPAD	Sistema de Informacion Nacional para la Respuesta y Rehabilitacion National Information System for Response and Rehabilitation
SIREDECI	Sistema Regional de Defensa Civil Regional Civil Defense System
SOP	Standard Operating Procedures
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
UNISDR	International Strategy of the United Nations for the Reduction of Disasters
USAID	United States Agency for International Development
USSOUTHCOM	United States Southern Command
V	Vulnerability
WFP	World Food Programme
WHO	World Health Organization

Executive Summary

This report details the final results of the National Disaster Preparedness Baseline Assessment (NDPBA) Project conducted in coordination with and in support of stakeholders in Peru. The goal of this project was to assess disaster risk at the subnational level and place it in the context of disaster risk reduction (DRR) efforts currently underway in Peru. The NDPBA provides a baseline for evidence-based DRR decision making while supporting the enhancement of data holdings to establish trends in the drivers of disaster risk.

The NDPBA is a stakeholder facilitated assessment with 4 key components: 1) focused stakeholder engagements in the form of facilitated knowledge exchanges; 2) risk and vulnerability assessment (RVA) at the region level; 3) a comprehensive disaster management (CDM) assessment at the national and regional level; and 4) the creation and promotion of a common foundation for data gathering and sharing. Key findings from both the RVA and CDM analyses identify relative strengths in the existing disaster management structure, as well as areas where improvements in process, structure, and resources would enhance Peru's DRR efforts.

RVA Findings

The results of this analysis determined that Cajamarca, Junin, Huancavelica, Puno, and La Libertad have the highest risk. Risk is composed of Multi-Hazard Exposure (MHE), Vulnerability (V), and Coping Capacity (CC). Risk is driven by high levels of hazard exposure in three of the top five regions (Cajamarca, Junin, and La Libertad). High levels of Vulnerability contribute to Huancavelica and Puno's risk.

Region	MHR		MHE		V		CC	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Cajamarca	0.610	1	0.754	3	0.488	9	0.412	19
Junin	0.599	2	0.795	2	0.446	12	0.444	16
Huancavelica	0.594	3	0.402	17	0.690	1	0.309	23
Puno	0.594	4	0.597	12	0.557	4	0.373	22
La Libertad	0.591	5	0.857	1	0.475	10	0.558	6

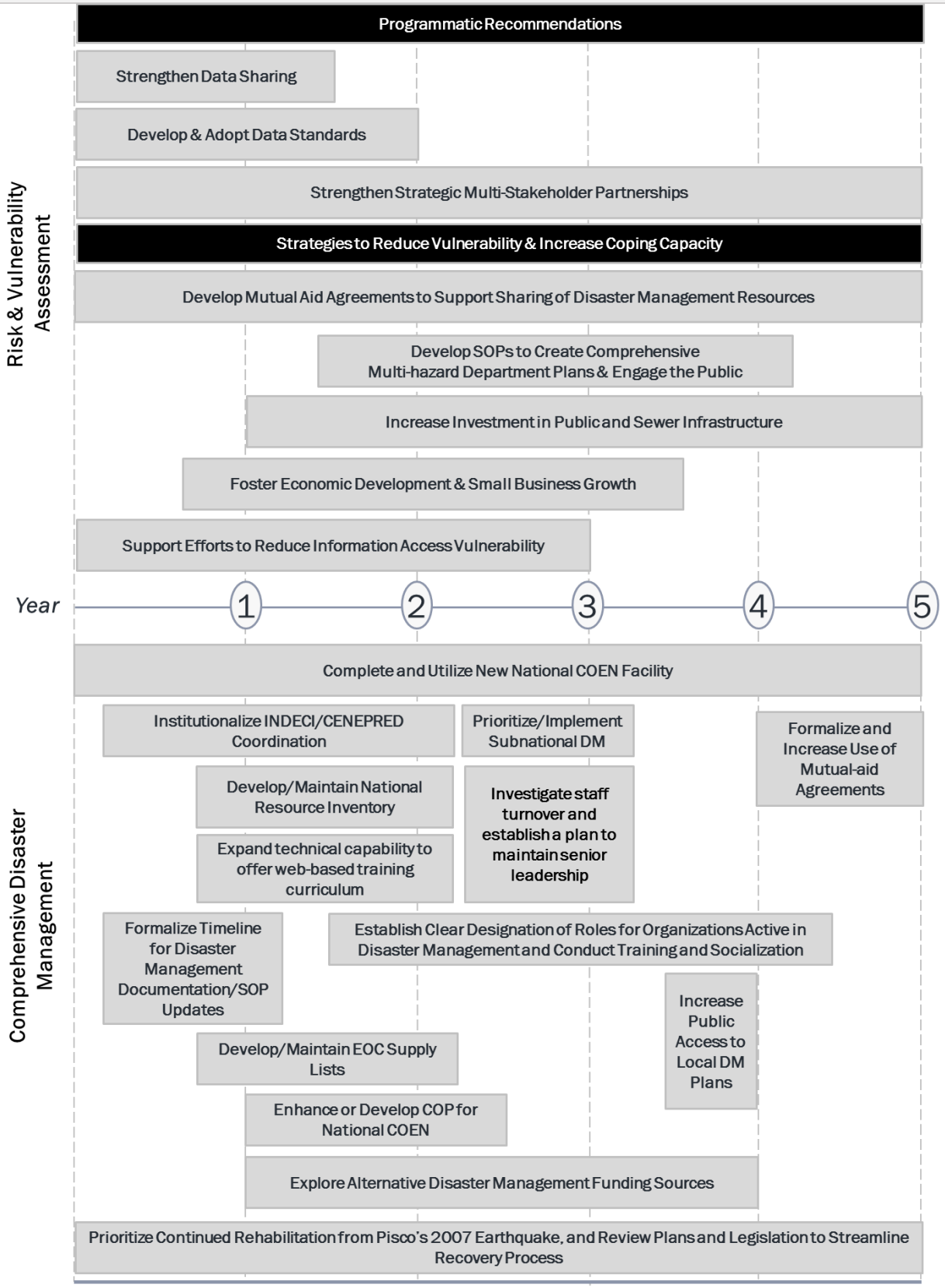
CDM Findings

Results from the CDM analysis highlight key areas where disaster management capacity and capability could be strengthened:

1. The lack of coordination and information sharing between INDECI and CENEPRED inhibit the overall effectiveness of Peru's disaster management system.
2. Training is limited in its geographic reach, primarily offered in urban areas. This creates a potential gap in access to training for disaster managers operating in rural communities.
3. MEF's budget allocations for disaster management are insufficient, presenting a significant challenge to the country's ability to promote directed investments for the SINAGERD system and increase Peru's hazard resilience.
4. Stakeholders indicate a lack of clearly defined roles and responsibilities for organizations active in disaster response, creating potential overlaps and duplication of effort.

5. Surveys and interviews highlighted concerns regarding the slow rate of recovery in the areas hardest hit by the 2007 Pisco earthquake – a source of frustration for many Peruvians, specifically in relation to building resilience against future hazard events.
6. The current disaster management common operating picture (COP) does not promote inter-agency stakeholder coordination and collaboration in the event of a disaster, hindering effective disaster decision-making.
7. The current National Emergency Operations Center (COEN) does not adequately meet the disaster management needs of Peru, leaving gaps in Peru's ability to effectively respond in the event of a major disaster.

PERU NDPBA Consolidated Recommendations



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Contents

Introduction

This report describes the results of the National Disaster Preparedness Baseline Assessment (NDPBA) project conducted by the Pacific Disaster Center (PDC) in partnership with stakeholders in Peru.

The objective of the NDPBA project was to identify the conditions in Peru that influence the preparedness and capability to effectively respond to and recover from disasters. The findings from this project are designed to support evidence-based decision making to enhance disaster risk reduction (DRR). The NDPBA stakeholder-driven approach facilitated the integration of national DRR goals and objectives into the Risk and Vulnerability and Comprehensive Disaster Management assessments.

The goal of the project was to enhance disaster resilience by:

- Summarizing disaster risk within the environmental, social, and economic context of Peru;
- Cataloguing and assessing disaster risk governance to provide actionable information that can be used to strengthen disaster management;
- Better understanding the disaster management capabilities in Peru to prepare for, respond to, and recover from any event;
- Analyzing multi-hazard risk to provide actionable information to guide DRR efforts to strengthen resilience; and
- Providing a forum for all vested stakeholders to share and communicate successes and challenges encountered in the understanding and management of disaster risk.

The NDPBA project provided a repeatable and measurable approach to examining key elements of DRR. The NDPBA approach consists of four distinct yet complimentary components. These components are: 1) focused stakeholder engagements in the form of facilitated knowledge exchanges; 2) risk and vulnerability assessment (RVA) at the region level; 3) a comprehensive disaster management (CDM) assessment at the national and regional levels; and 4) the creation and promotion of a common foundation for data gathering and sharing.

The NDPBA project was uniformly undertaken to support short- and long-term preparedness activities, to include:

- A detailed subnational risk and vulnerability assessment that included the following elements: multi-hazard exposure, vulnerability, coping capacity, lack of resilience, and multi-hazard risk;
- A review of national and subnational CDM capabilities to identify gaps and provide recommendations for strengthening preparedness and response;
- A proposed five-year plan to build capacity and capability; and
- Data integration and information sharing.

The data and final analysis provided in this report are integrated into the Pacific Disaster Center's (PDC) decision-support system, known as DisasterAWARE™, allowing for open and free access to critical DRR data and information. Access to the data and system can be requested through ndpba@pdc.org.

Methods

This section of the report summarizes the NDPBA methodology implemented in Peru, to include data gathering procedures, data processing, and analysis.

Facilitated Knowledge Exchanges

Facilitated stakeholder engagements acknowledge the Guiding Principles of the Sendai Framework for Disaster Risk Reduction (DRR) and serve as a key component of the NDBPA. Over the duration of the Peru project, stakeholders were invited to attend three Knowledge Exchanges (*Initial, Midterm, and Final*) as well as participate in data reviews, archival research, detailed interviews, and standardized surveys. The Knowledge Exchanges provided a venue for stakeholders to present on disaster management topics of interest and highlight the important work each organization is undertaking to support DRR. Leveraging a participatory approach, a diverse group of traditional and non-traditional disaster management stakeholders were engaged. This encouraged active participation and promoted diversity among participants and partners.

In advance of the Knowledge Exchanges, in-depth archival research was conducted to identify disaster management stakeholders as well as their capacities. Once this was complete, stakeholders were invited to attend an Initial Knowledge Exchange. At the event, presentations were given by PDC on the NDPBA methodology. In-country stakeholders were invited to give presentations on disaster management topics of interest to them. Question and answer sessions identified data gaps, information availability, as well as identified other stakeholders in the disaster management community within Peru. Following the exchange, meetings with stakeholders were scheduled to conduct detailed interviews and share data and information.

This process was facilitated by partners such as the lead national disaster management agencies, the National Institute of Civil Defense (Instituto Nacional de Defensa Civil; INDECI) and the National Center for Estimates, Prevention, and Disaster Risk Reduction (Centro Nacional de Estimación, Prevención y Reducción del Riesgo de Desastres; CENEPRED); the Armed Forces (Ejército del Peru), Ministry of Defense (Ministerio de Defensa; MINDEF); as well as the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) national representative; and national and international NGOs.

Risk and Vulnerability Assessment

The purpose of conducting a subnational baseline Risk and Vulnerability Assessment (RVA) was to characterize elements of multi-hazard risk. The subnational NDBPA RVA was adapted from PDC's established Global RVA framework to meet the specific needs of Peru. To capture the complex concept of risk, PDC's RVA leverages a composite index approach. Composite indices are constructed by combining data sets that represent general themes that contribute to risk (e.g., access to information, health status, or governance). These individual variables, or *indicators,* are uniform and quantifiable characteristics that reflect the overall concepts required for analysis. Appropriate subnational indicators were identified in partnership with stakeholders. The data were combined to represent the components of hazard exposure, vulnerability, and coping capacity.

The index created represents Multi-Hazard Risk (MHR) as a function of *component indices* representing Multi-Hazard Exposure (MHE), Vulnerability (V), and Coping Capacity (CC).

- *Multi-Hazard Exposure* describes the population present in hazard zones that are thereby subject to potential losses.
- *Vulnerability* describes the characteristics and circumstances of a community, system, or asset that make it susceptible to the damaging effects of a hazard.
- *Coping Capacity* characterizes the ability of people, organizations, and systems, using available skills and resources, to face and manage adverse conditions, emergencies, or disasters.

The assessment considered exposure to the following hazards: flooding, landslides (mass movement), volcanic ash, low temperature, earthquakes, and tsunamis. The basic model for the Multi-Hazard Risk Index is:

$$\textit{Multi-Hazard Risk Index} = (MHE + V + (1 - CC)) / 3$$

The Lack of Resilience (LR) Index represents the combination of Vulnerability (V) and Coping Capacity (CC). This basic model for Lack of Resilience Index is:

$$\textit{Lack of Resilience Index} = (V + (1 - CC)) / 2$$

The methodological process for the NDPBA RVA is illustrated below in Figure 1.

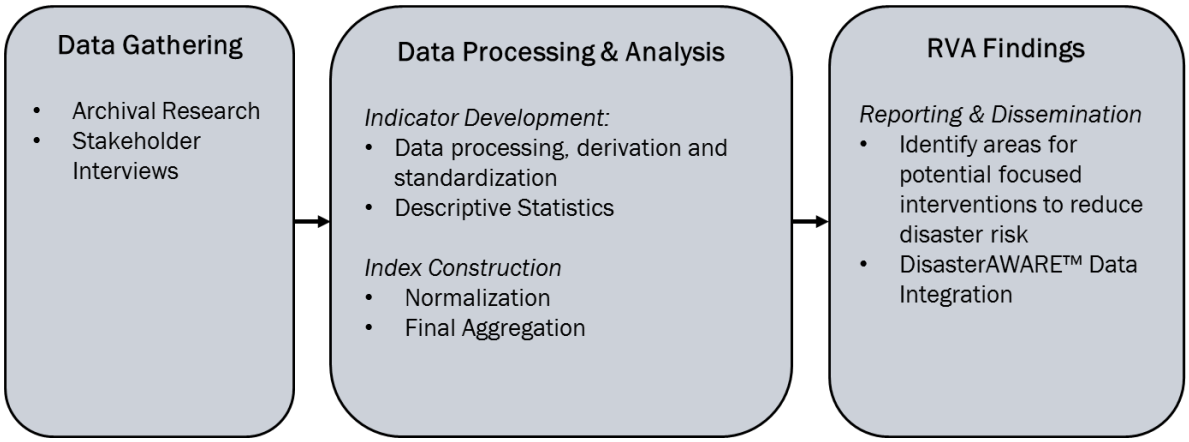


Figure 1. NDPBA Risk and Vulnerability Assessment (RVA) methodological process

Data Gathering

In partnership with stakeholders, a review of archival research and stakeholder interviews were conducted to identify potential data to be included in the study. Each indicator was gathered from vetted sources, and evaluated for potential use in the RVA model. Data were scrutinized to identify possible gaps, missing values, and to document any caveats regarding data quality or completeness. In certain cases, missing documentation or lack of data lineage precluded the use of datasets in the analysis. For details on the RVA datasets used in this analysis see *Appendix A*.

Data Processing and Analysis

Datasets used in the analysis were standardized for use as indicators to make meaningful comparisons. For details on RVA index construction see *Appendix B: RVA Index Construction.*

RVA Findings

The results of the analysis helped to identify potential areas to focus limited resources in an effort to reduce disaster risk. As part of the final report, programmatic recommendations to support future RVAs and specific strategies to reduce vulnerabilities and increase coping capacities at the subnational level are provided. The analyzed data have been integrated into PDC's DisasterAWARE™ .

Comprehensive Disaster Management (CDM) Assessment

Comprehensive Disaster Management (CDM) is the integrated approach of managing hazards through all phases of disaster management. Leveraging the latest academic research, the CDM analysis examines core elements of effective disaster management. The assessment is constructed to provide a systematic understanding of the challenges to operationalizing disaster management techniques in support of diverse community needs. The results of the assessment provide necessary information for policy makers to effectively direct investments in an effort to save lives and reduce losses. The CDM assessment can provide greater context to the RVA by placing the risk of each region into the larger DRR framework of Peru.

For the purposes of this assessment, CDM is conceptualized as the function of five components (see Figure 2).

- **Good Leadership by Professionally Trained Officials:** examines the professionalization of the disaster management field.
- **Foundation of Supportive Values for Government Action**: examining the backing, support, and sponsorship of CDM efforts.
- **Legal Authority to Act**: examines the legal framework that governs disaster management.
- **Advocacy Supporting Action**: examining stakeholder support and backing to include the general public, NGOs, and those providing assistance before, during, and after an event.
- **The Necessary Institutional Resources**: examines available resources (material and human) that are provided by the jurisdiction or through mutual-aid agreements and partnerships with neighboring jurisdictions.

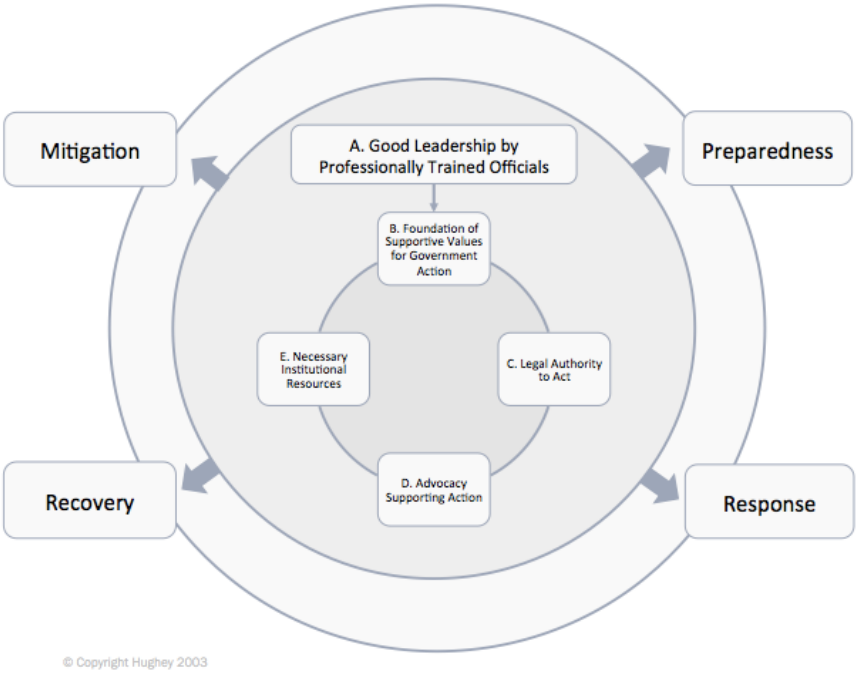


Figure 2. Comprehensive Disaster Management Model (Hughey, 2003)

The methodological process for the NDPBA CDM is illustrated below in Figure 3. The CDM data were analyzed using a mixed methods approach. The approach combines both qualitative and quantitative data and methods of analysis, allowing for a more complete assessment of the CDM theoretical framework.

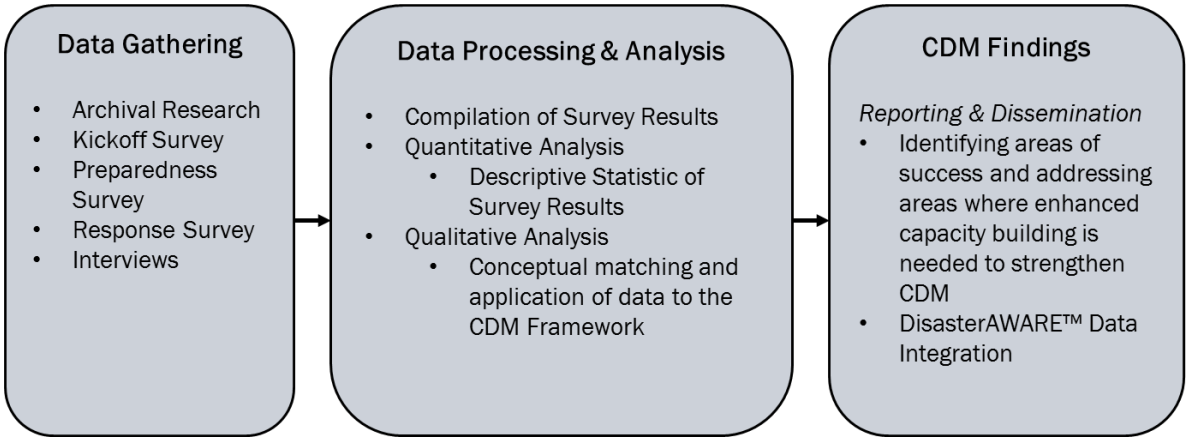


Figure 3. NDPBA Comprehensive Disaster Management (CDM) methodological process.

Data Gathering

Archival research, surveys, and interviews were conducted by PDC staff in partnership with stakeholders in Peru. Using the CDM framework as a guide, researchers sought documentation on the disaster management structure. The goal was to assess the presence of official documents outlining the components necessary to examine Peru's framework for disaster management. Data were compiled,

sorted by CDM component (as shown in Figure 2), and appropriate information was abstracted for analysis.

Data Processing and Analysis

Surveys were administered during the Midterm Knowledge Exchange focusing on aspects of preparedness and response. Responses were compiled and prepared for analysis. Summary statistics and frequencies were generated for ranked-response questions. Open-ended questions were analyzed qualitatively to produce commonly occurring themes to guide further investigation and inform the perceived status of preparedness and response in Peru. For details on the qualitative methodology utilized in the CDM analysis see the **Qualitative Section (Questions 29-33)** of *Appendix C: CDM Preparedness Survey (July 2014)*.

Figure 4, below, illustrates the type of data gathered and analyzed as part of the CDM analysis.

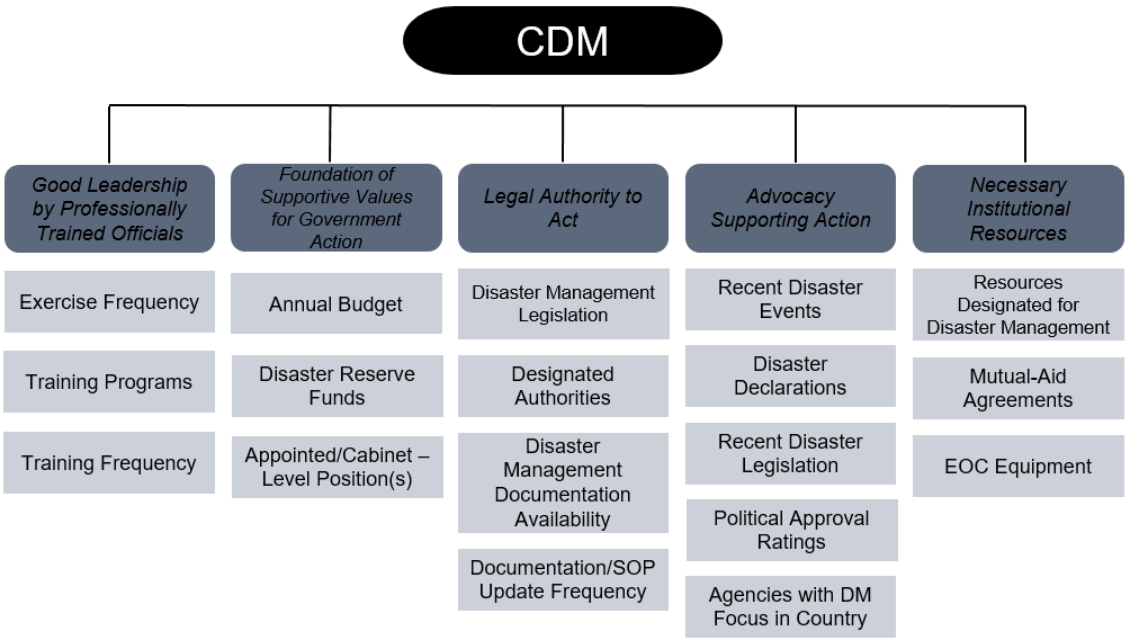
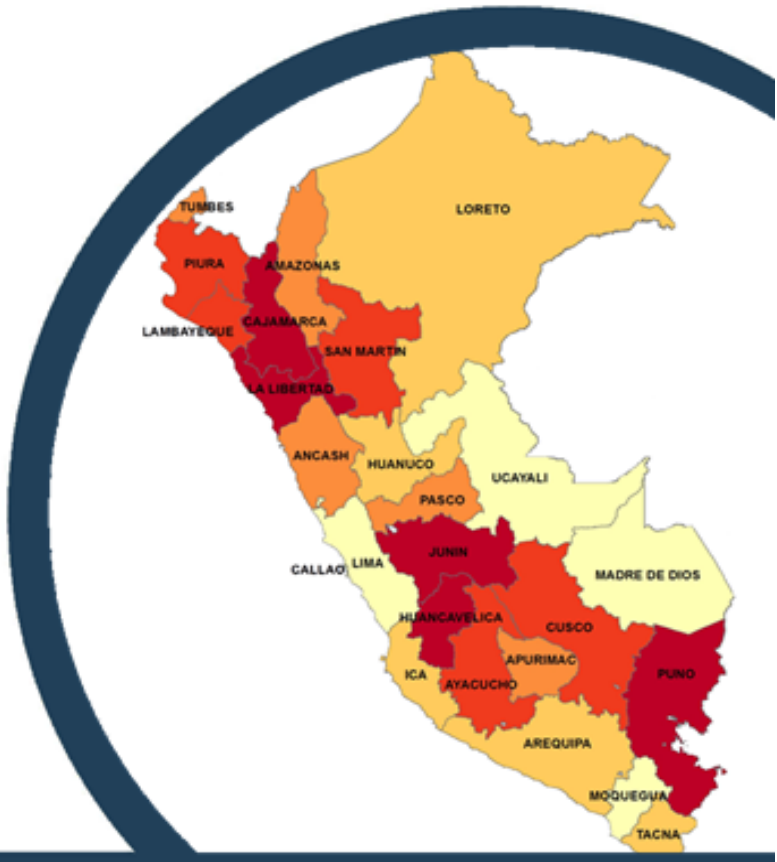


Figure 4. Datasets for CDM analysis

CDM Findings

The results of the analysis helped to identify potential areas that may limit the full implementation of CDM. As part of this report, recommendations to support the implementation of a complete CDM are given with the goal of increasing DRR capacity in Peru. Where appropriate relevant data has been integrated into PDC's DisasterAWARE™.

Risk and Vulnerability Assessment (RVA) Findings



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Findings: Risk and Vulnerability Assessment

The RVA results presented in this section represent the analysis of the 25 regions in Peru. An overview of the national results is provided followed by a detailed review of each region.

Summary

Multi-hazard Risk (MHR), Multi-Hazard Exposure (MHE), Vulnerability (V) and Coping Capacity (CC) scores and rank are summarized below in Table 1. A five-page detailed review of each region follows this section.

The RVA helps to:

- Identify the level of exposure an area has to multiple hazards;
- Assess the aspects of populations that make them susceptible to hazard impacts;
- Identify characteristics of an area that can be improved to support coping strategies following hazard events; and
- Place resources in areas that may need additional support following disasters.

Table 1. Multi-Hazard Risk (MHR) Index scores, rankings, and component indices for Peru

Region	MHR		MHE		V		CC	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Cajamarca	0.610	1	0.754	3	0.488	9	0.412	19
Junin	0.599	2	0.795	2	0.446	12	0.444	16
Huancavelica	0.594	3	0.402	17	0.690	1	0.309	23
Puno	0.594	4	0.597	12	0.557	4	0.373	22
La Libertad	0.591	5	0.857	1	0.475	10	0.558	6
Piura	0.587	6	0.704	6	0.512	7	0.455	15
San Martin	0.565	7	0.754	4	0.404	16	0.464	14
Cusco	0.531	8	0.661	10	0.432	13	0.498	11
Lambayeque	0.515	9	0.594	13	0.452	11	0.501	10
Ayacucho	0.514	10	0.166	24	0.609	2	0.233	25
Ancash	0.499	11	0.622	11	0.387	17	0.514	9
Apurimac	0.486	12	0.196	22	0.543	6	0.282	24
Amazonas	0.486	13	0.427	15	0.419	15	0.389	21
Tumbes	0.466	14	0.515	14	0.372	19	0.490	12
Pasco	0.456	15	0.399	19	0.498	8	0.528	8
Arequipa	0.451	16	0.738	5	0.336	24	0.721	2
Ica	0.449	17	0.682	9	0.347	21	0.684	3
Tacna	0.437	18	0.400	18	0.346	22	0.434	17
Huanuco	0.433	19	0.179	23	0.545	5	0.424	18
Loreto	0.432	20	0.120	25	0.567	3	0.390	20
Ucayali	0.424	21	0.315	20	0.427	14	0.469	13
Callao	0.421	22	0.691	8	0.234	25	0.663	4
Lima	0.415	23	0.699	7	0.345	23	0.799	1
Moquegua	0.394	24	0.421	16	0.356	20	0.594	5
Madre de Dios	0.369	25	0.268	21	0.386	18	0.546	7

Multi-Hazard Exposure

Multi-Hazard Exposure describes the population present in hazard zones that are thereby subject to potential losses. For this assessment, exposure considers six hazard types: volcanic ash (for the Misty, Sabancaya, and Ubinas volcanoes), mass movement susceptibility (high and very high), tsunami inundation, earthquake (areas of historical earthquake intensity MMI VII-XI), low temperature susceptibility (high and very high), and flood critical points. For each of the six hazard types, exposure is based on the population residing within hazard zones.

The Multi-Hazard Exposure Index is a function of both raw and relative population exposure. Raw population exposure provides an indication of how many people are exposed, which can assist in planning and provide an idea of the raw scale of potential response activities such as evacuation or sheltering. In contrast, relative population exposure is expressed as a proportion of base population. Relative exposure helps highlight the relevance of hazards within regions that have relatively small populations.

Examining hazard exposure data for each hazard type provides a cross-section that can be used to identify the specific hazards contributing to exposure in each region. Understanding exposure to specific hazards is valuable for determining appropriate mitigation actions. Differences in the type of hazard inherently dictate which mitigation options could be most effective in reducing losses and casualties in Peru. This assessment demonstrates the importance of understanding hazard exposure not only in terms of the total number of people exposed, but also the hazards that threaten them.

Vulnerability

Vulnerability refers to the characteristics and circumstances of a community, system, or asset that make it susceptible to the damaging effects of a hazard. Areas with higher Vulnerability Index scores are more susceptible to harm from hazards, often lacking the resources to adequately prepare for, respond to, and recover from disasters. Recognizing the sensitivities of vulnerable locales, the Vulnerability Index can be used for decision support in comparing and prioritizing disaster mitigation projects and allocating aid following hazard events.

An examination of the Vulnerability Index subcomponents reveals the drivers of vulnerability within the regions. In Peru, Huancavelica (ranked 1 of 25) not only represents the highest overall vulnerability, but also ranks among the highest in economic constraints, access to information vulnerability, vulnerable health status, and gender inequality. Ayacucho (ranked 2 of 25) shows a similar distribution of vulnerability, driven primarily by economic constraints and access to information vulnerability. Vulnerability in Loreto (ranked 3 of 25) is driven by clean water vulnerability and recent disaster impacts. In context, these translate to increased susceptibility to hazard impacts as a result of an inability to access and comprehend vital emergency information, compromised water and sanitation services, gender-based differences in access to resources, services, and opportunities, and limited economic resources.

While many of these factors are inextricably linked, vulnerability is complex and a single intervention may not acknowledge all components. In the cases of Huancavelica and Ayacucho, disaster managers and policy makers may take action to direct humanitarian aid and promote economic growth to reduce vulnerability. In Loreto, programs to develop and improve water and sewer infrastructure could provide clean water and better sanitation services. These improvements also have implications for improving health status and reducing overall vulnerability. Analysis of the vulnerability subcomponents is important

for understanding where sensitive populations are located and how to design interventions to reduce their susceptibility to negative hazard impacts.

Coping Capacity

Coping capacity describes the ability of people, organizations, and systems, using available skills and resources, to face and manage adverse conditions, emergencies, or disasters. The Coping Capacity Index represents factors that influence the ability of a region to effectively absorb negative impacts associated with a hazard event. Low Coping Capacity Index scores represent limitations in a regions' ability to absorb, manage, and recover from hazard events. This information can be used to help decision makers focus on areas of lower capacity and identify areas for focused improvement.

The Coping Capacity Index was calculated using a *weighted average* of the four subcomponents. Weighting was based on relative importance to coping capacity, ease of creating an intervention to increase coping capacity, as well as data quality and availability. Governance was weighted at 40%, Infrastructure at 25%, Economic Capacity at 25%, and Environmental Capacity at 10%, thereby placing less emphasis on the environmental dimension and more emphasis on the governance aspects of coping capacity.

By analyzing the different subcomponents of the Coping Capacity Index it becomes possible to identify distinct factors that drive a region's ability to cope with hazards. For example, low Coping Capacity in Ayacucho is attributable to low scores in economic capacity, infrastructure and environmental capacity. Huancavelica has very little economic or environmental capacity, ranking lowest in the country for both. Apurímac similarly exhibits low scores in each of the subcomponents. In each of these regions, lower communications infrastructure scores contribute to reduced coping capacity.

Low economic capacity across the three regions (Ayacucho, Huancavelica, Apurímac) suggests that households in these areas may not have the financial reserves to absorb or manage hazard losses. This can in turn lead to greater dependence on external aid during response and recovery. Lower infrastructure scores can indicate a reduction in the exchange of information, and reduced access to vital resources and health services. Weaker governance can lead to a range of problems in the management of hazards including reduced public safety and ineffective disaster planning. Example interventions could include fostering economic production and small business growth to raise incomes, and national campaigns to improve equity of infrastructure. Additional support for local police, firefighters, and emergency medical services may improve public safety, both in normal conditions and during an emergency. Finally, adopting comprehensive plans for each phase of disaster management, and engaging the public to understand and inform these plans could improve governance in the context of this assessment.

Examining the pattern of coping capacity across the country allows disaster managers and decision makers to identify areas that may benefit from mutual-aid agreements. For example, the regions of Lima (ranked 1 of 25) and Huancavelica (ranked 13 of 14) share a border in Peru but exhibit scores on opposite sides of the Coping Capacity Index. In the context of a disaster, resource sharing could be beneficial to Huancavelica, taking the form of mutual-aid. Lima may provide assistance to neighboring regions in disaster response and recovery. In this way, Huancavelica could benefit from Lima's increased coping capacity despite not having the resources within its own borders.

Lack of Resilience

Lack of Resilience combines Vulnerability and Coping Capacity to represent the combination of susceptibility to impact and the relative inability to absorb, respond to, and recover from negative impacts that occur over the short-term. Vulnerability and coping capacity are composed of closely related indicators. Because Vulnerability and Coping Capacity are measured independent of the hazard, disaster managers can overlay the Lack of Resilience Index with real-time hazard data to estimate risk on a per-event basis as new threats occur.

Table 2: Lack of Resilience (LR) Index scores, rankings, and component indices for Peru

Region	LR		V		CC	
	Score	Rank	Score	Rank	Score	Rank
Huancavelica	0.691	1	0.690	1	0.309	23
Ayacucho	0.688	2	0.609	2	0.233	25
Apurimac	0.630	3	0.543	6	0.282	24
Puno	0.592	4	0.557	4	0.373	22
Loreto	0.588	5	0.567	3	0.390	20
Huanuco	0.560	6	0.545	5	0.424	18
Cajamarca	0.538	7	0.488	9	0.412	19
Piura	0.529	8	0.512	7	0.455	15
Amazonas	0.515	9	0.419	15	0.389	21
Junin	0.501	10	0.446	12	0.444	16
Pasco	0.485	11	0.498	8	0.528	8
Ucayali	0.479	12	0.427	14	0.469	13
Lambayeque	0.476	13	0.452	11	0.501	10
San Martin	0.470	14	0.404	16	0.464	14
Cusco	0.467	15	0.432	13	0.498	11
La Libertad	0.458	16	0.475	10	0.558	6
Tacna	0.456	17	0.346	22	0.434	17
Tumbes	0.441	18	0.372	19	0.490	12
Ancash	0.437	19	0.387	17	0.514	9
Madre de Dios	0.420	20	0.386	18	0.546	7
Moquegua	0.381	21	0.356	20	0.594	5
Ica	0.332	22	0.347	21	0.684	3
Arequipa	0.307	23	0.336	24	0.721	2
Callao	0.286	24	0.234	25	0.663	4
Lima	0.273	25	0.345	23	0.799	1

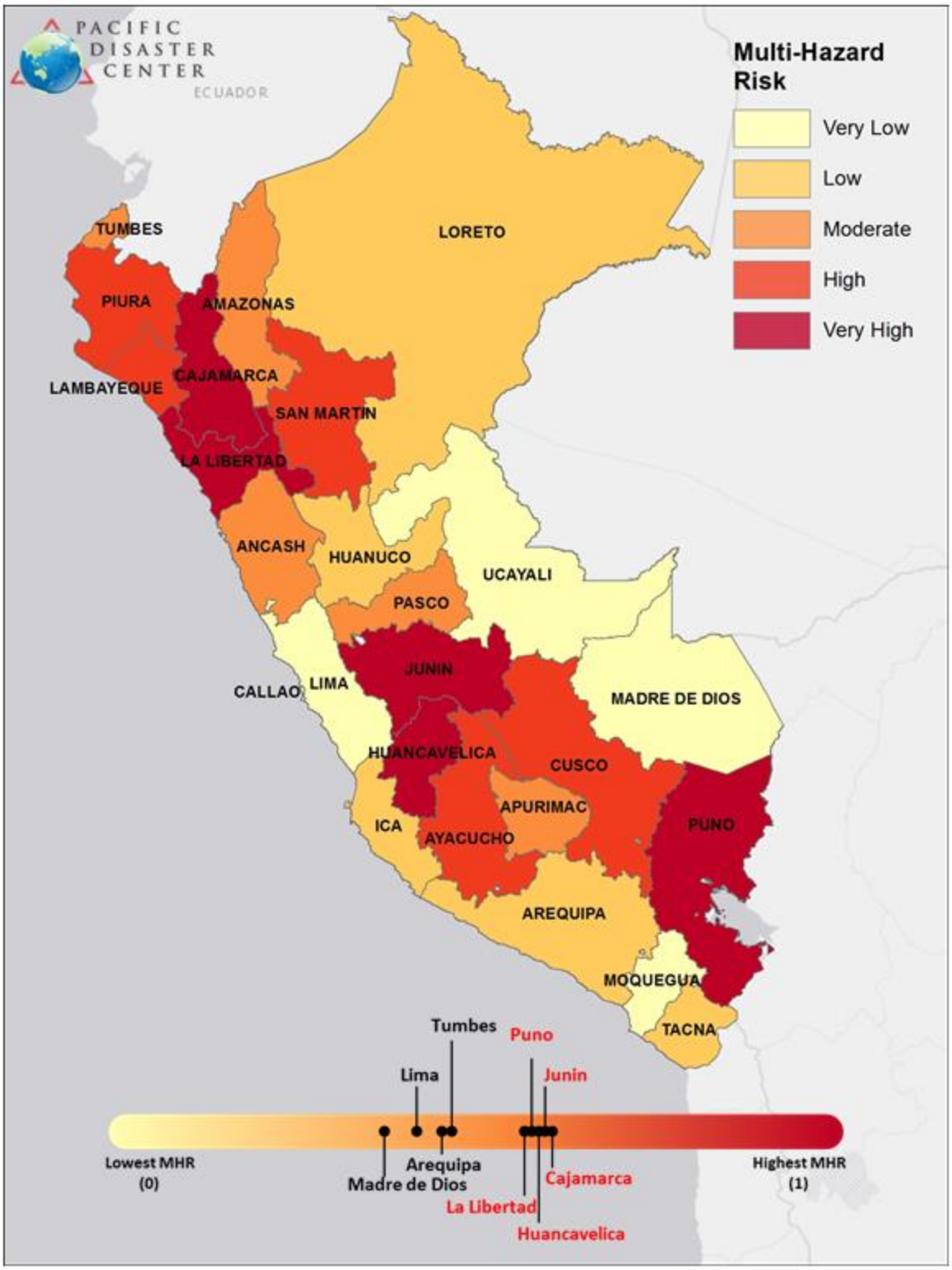


Figure 5. Distribution of Multi-Hazard Risk Index scores across regions and relative ranking of selected regions by MHR score.

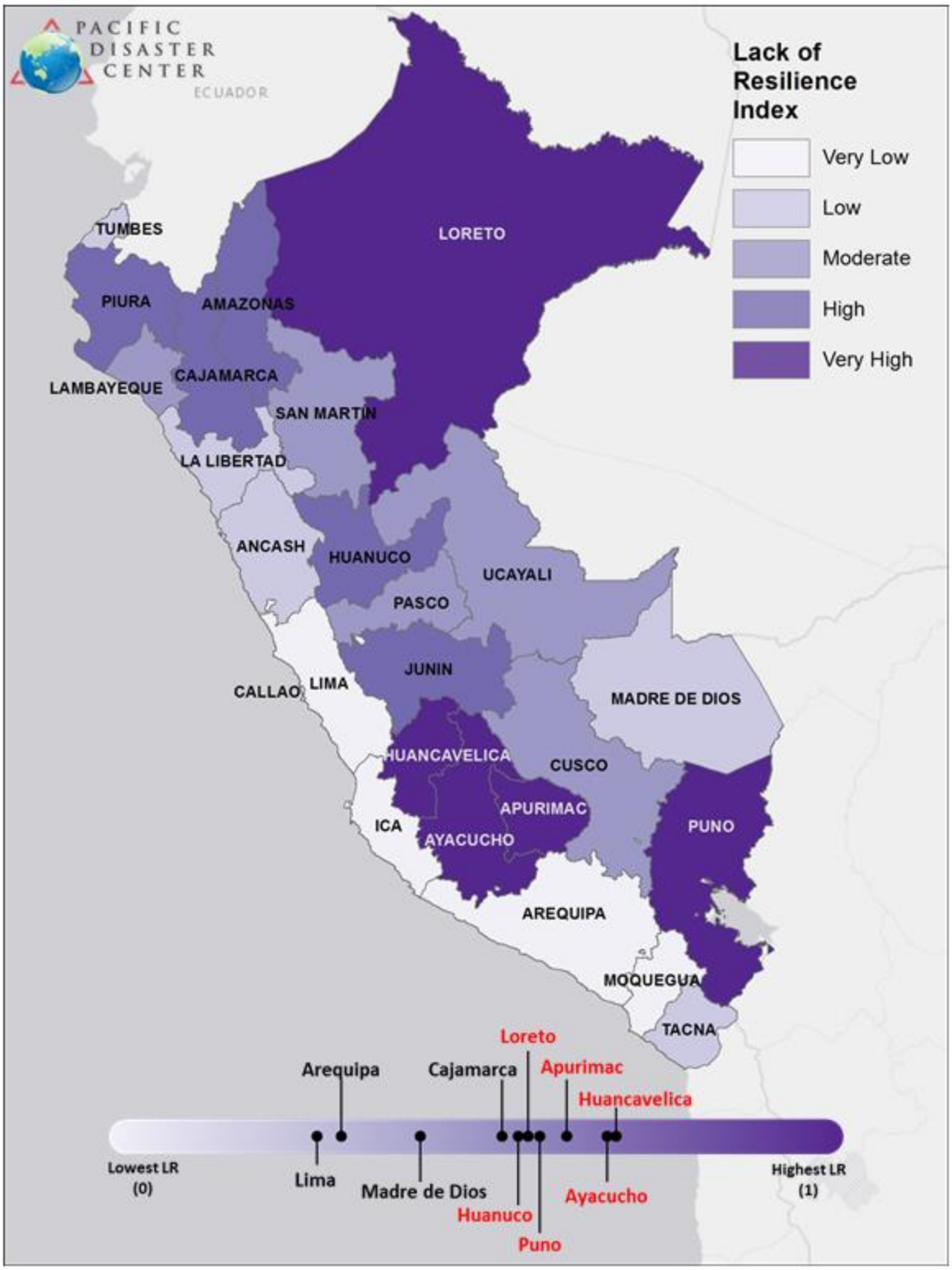


Figure 6. Distribution of Lack of Resilience Index scores across regions and relative ranking of selected regions by Lack of Resilience score.

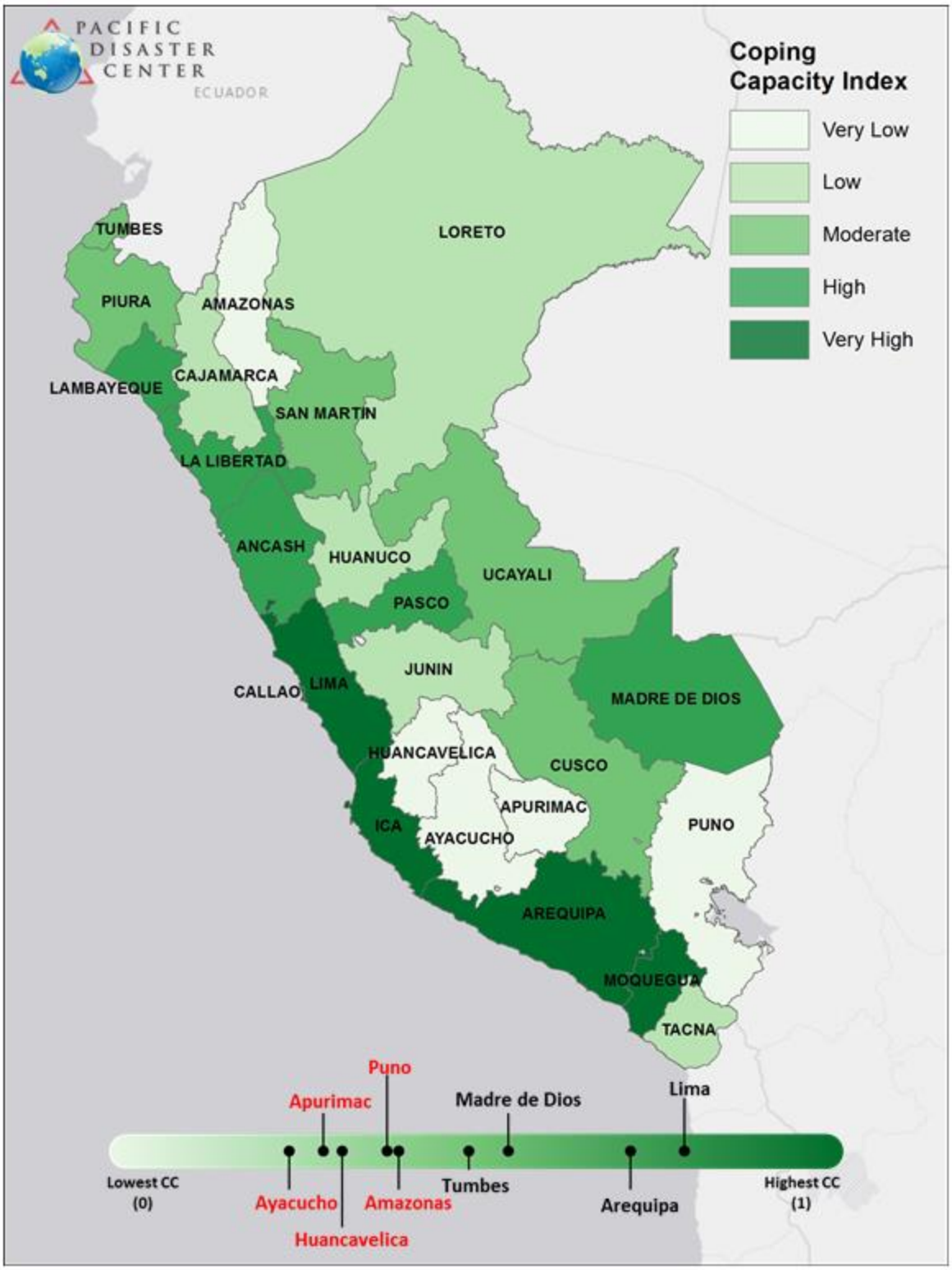


Figure 7. Distribution of Coping Capacity Index scores and relative ranking of selected regions by Coping Capacity score.

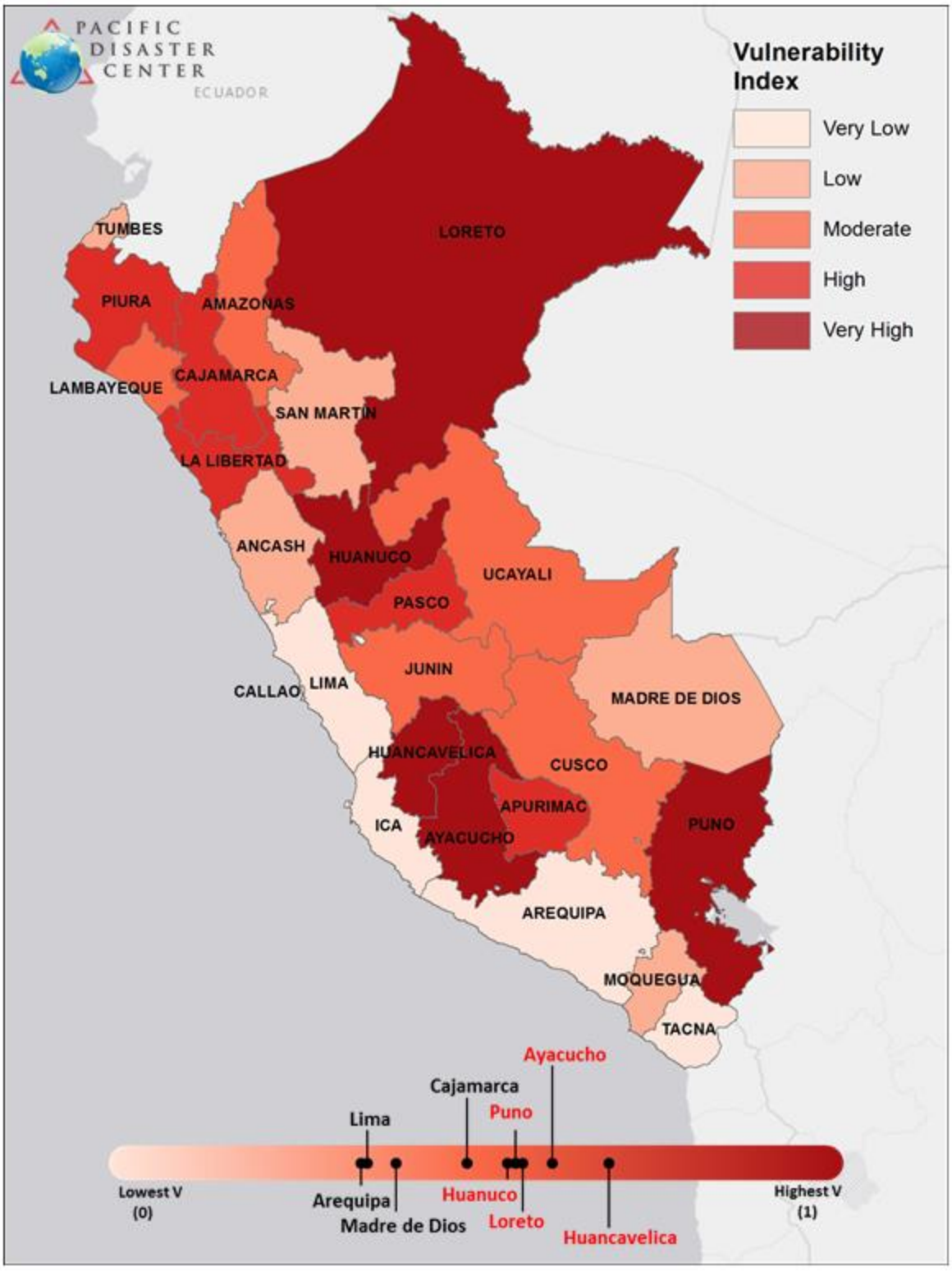


Figure 8. Distribution of Vulnerability Index scores across regions and relative ranking of selected regions by Vulnerability score.

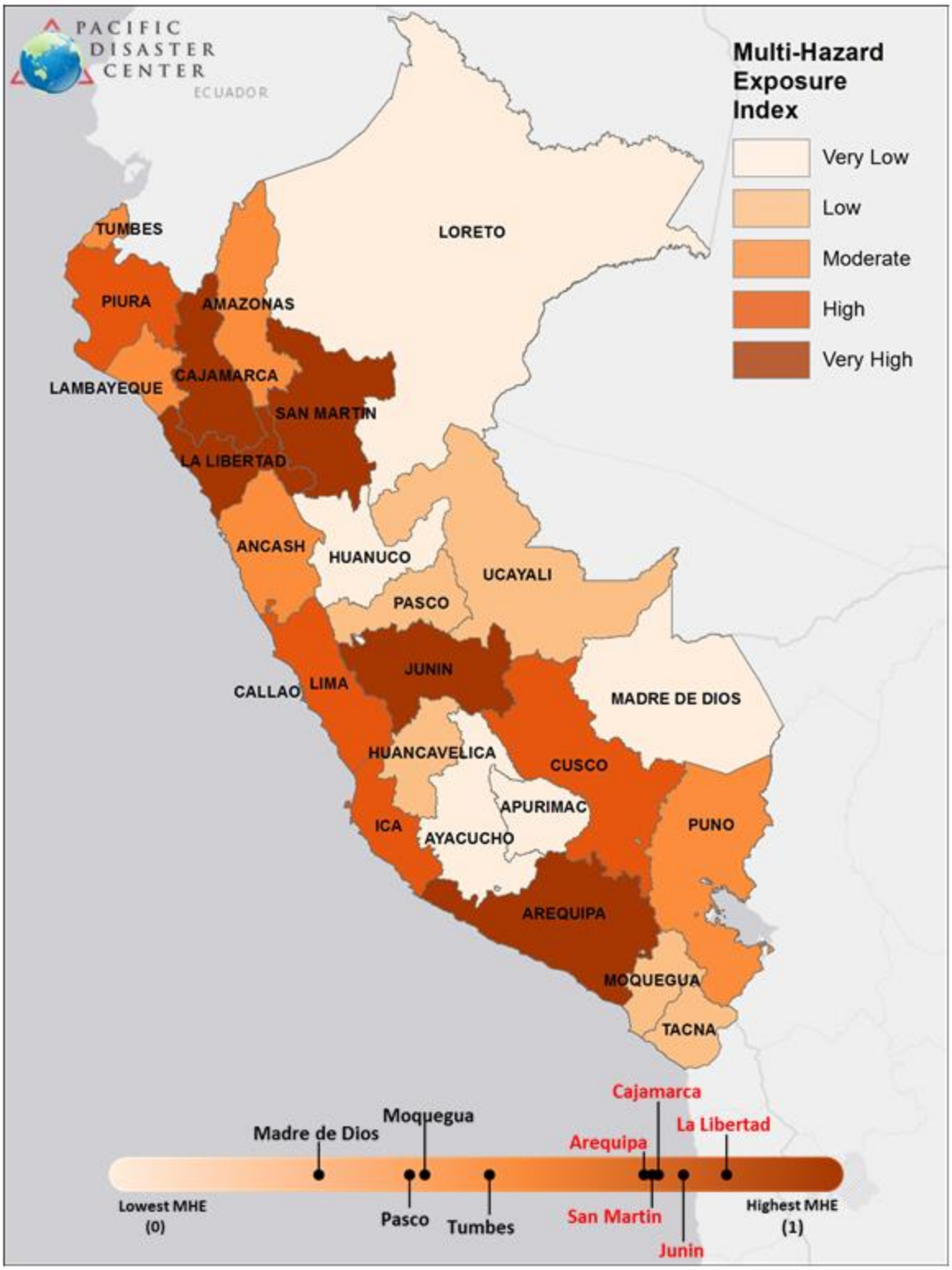
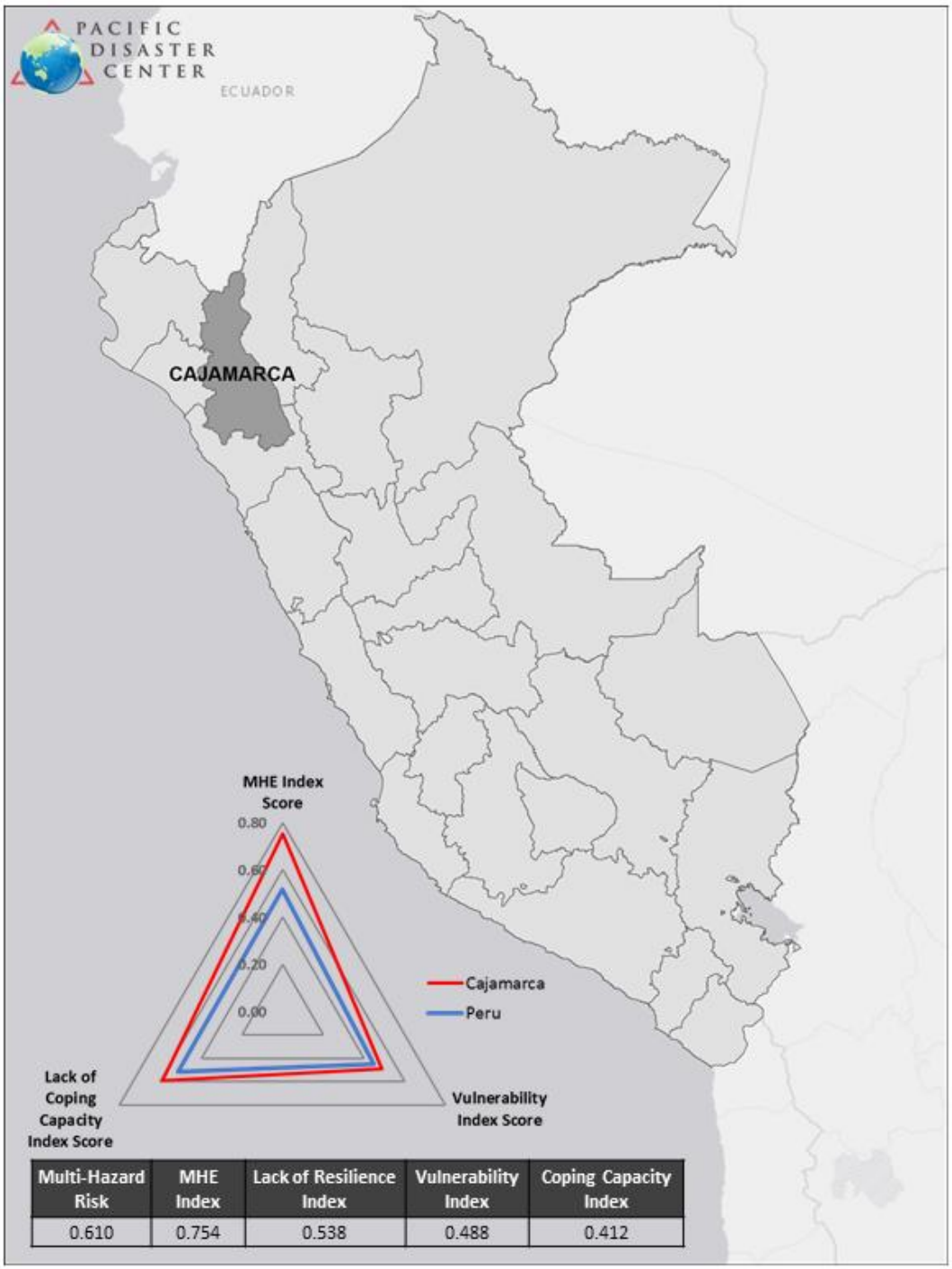


Figure 9. Distribution of Multi-Hazard Exposure Index scores across regions with relative ranking of selected regions by Multi-Hazard Exposure score.

Cajamarca: Risk

Cajamarca ranks **1 of 25** on the **Multi-Hazard Risk Index** with a score of **0.610**. Cajamarca's score and ranking are due to very high Multi-Hazard Exposure combined with low Coping Capacity and high Vulnerability scores. Cajamarca has the 3rd highest MHE in the country, the 9th highest Vulnerability, and the 19th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.610	0.754	0.538	0.488	0.412

Cajamarca: Lack of Resilience

Cajamarca ranks **7 of 25** on the **Lack of Resilience Index** with a score of **0.538**. Cajamarca's score and ranking are due to high Vulnerability combined with low Coping Capacity scores. Cajamarca has the 9th highest Vulnerability and the 19th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Cajamarca are: **Information Access Vulnerability**, **Gender Inequality**, and **Health Care Capacity.**

Table 3. Lack of Resilience Index and Component scores for Cajamarca

Index	Cajamarca	
	Score	**Rank**
Lack of Resilience	0.538	7
Components		
Vulnerability	0.488	9
Coping Capacity	0.412	19

Cajamarca: Coping Capacity

Cajamarca's coping capacity is **19th out of 25** with a score of **0.412**. The thematic areas with the weakest relative scores are **Environmental Capacity, Economic Capacity,** and **Health Care Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

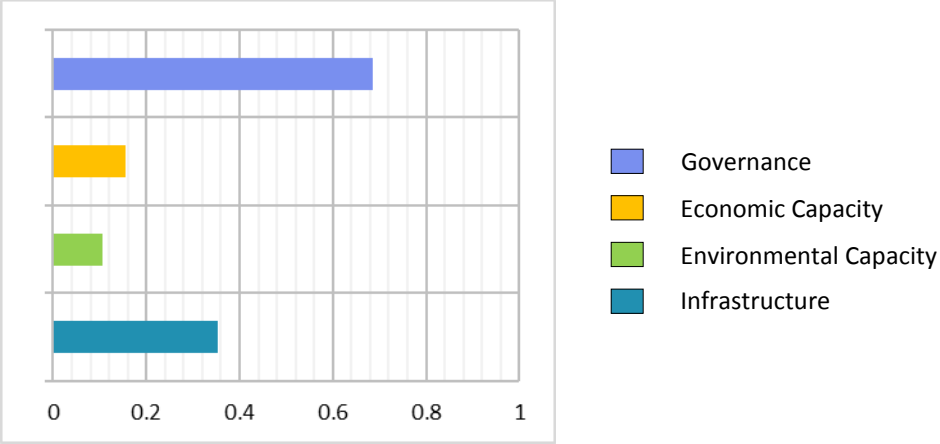


Figure 10. Coping Capacity subcomponents for Cajamarca

Table 4. Coping Capacity Index, subcomponent and sub-index scores for Cajamarca

Index	Cajamarca	
	Score	**Rank**
Coping Capacity	0.412	19
Subcomponents		
Governance	0.687	7
Economic Capacity	0.156	22
Environmental Capacity	0.106	17
Infrastructure	0.352	18
Infrastructure Sub-indices		
Health Care	0.084	25
Transportation	0.658	5
Communications	0.314	19

Cajamarca: Vulnerability

Cajamarca ranks **9th out of 25** on the Vulnerability Index with a score of **0.488**. Vulnerability in Cajamarca is strongly influenced by **Information Access Vulnerability, Gender Inequality,** and **Economic Constraints** subcomponent scores.

Table 5. Vulnerability Index and subcomponent index scores for Cajamarca

Index	Cajamarca	
	Score	**Rank**
Vulnerability	0.488	9
Subcomponents		
Economic Constraints	0.636	3
Info Access Vulnerability	0.755	3
Vulnerable Health Status	0.514	12
Clean Water Vulnerability	0.640	7
Population Pressures	0.031	23
Environmental Stress	0.535	8
Recent Disaster Impacts	0.126	23
Gender Inequality	0.667	1

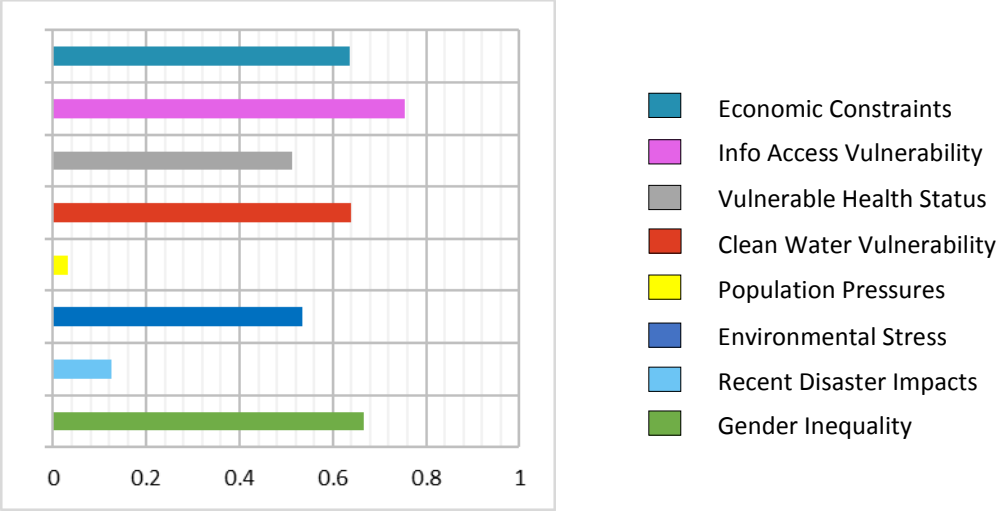


Figure 11. Vulnerability subcomponents for Cajamarca

Cajamarca: Multi-Hazard Exposure

Cajamarca ranks **3rd out of 25** on the MHE index with a score of **0.754**. A large proportion of the population is exposed to **mass movement, seismic activity, low temperature,** and **flood.**

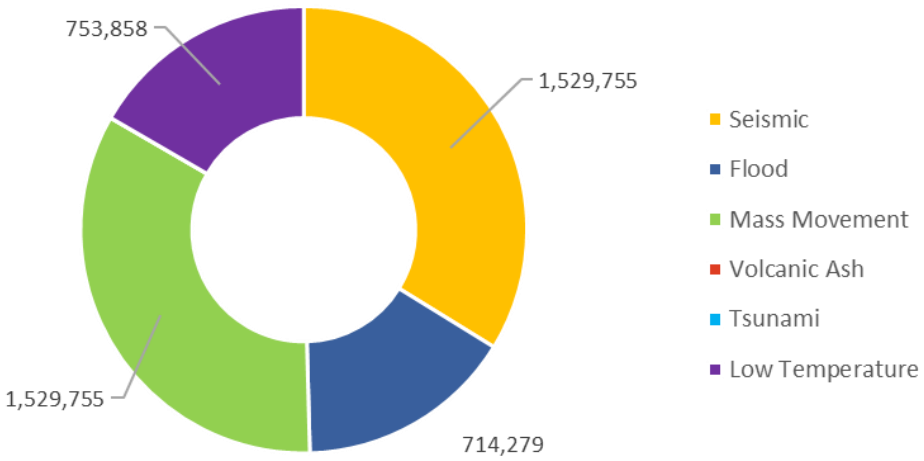


Figure 12. Raw population exposure by hazard type for Cajamarca

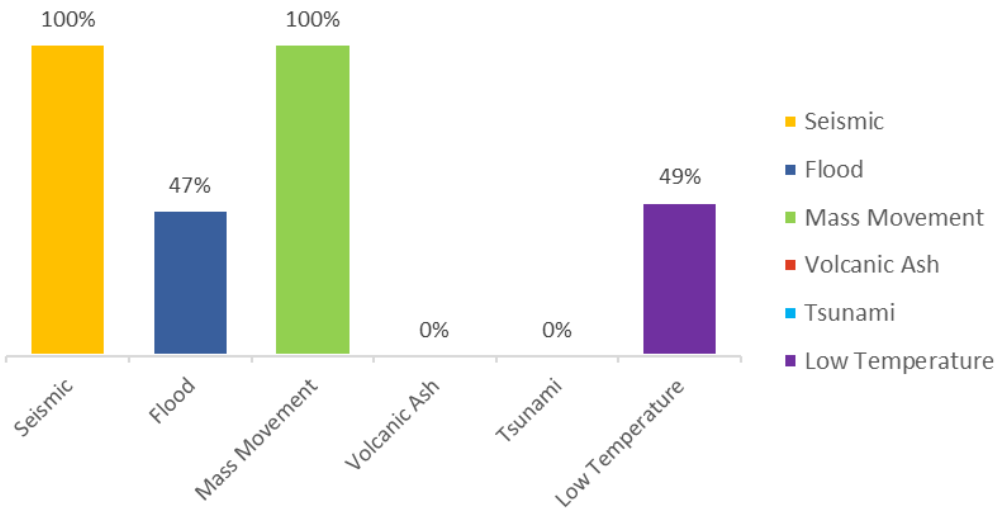


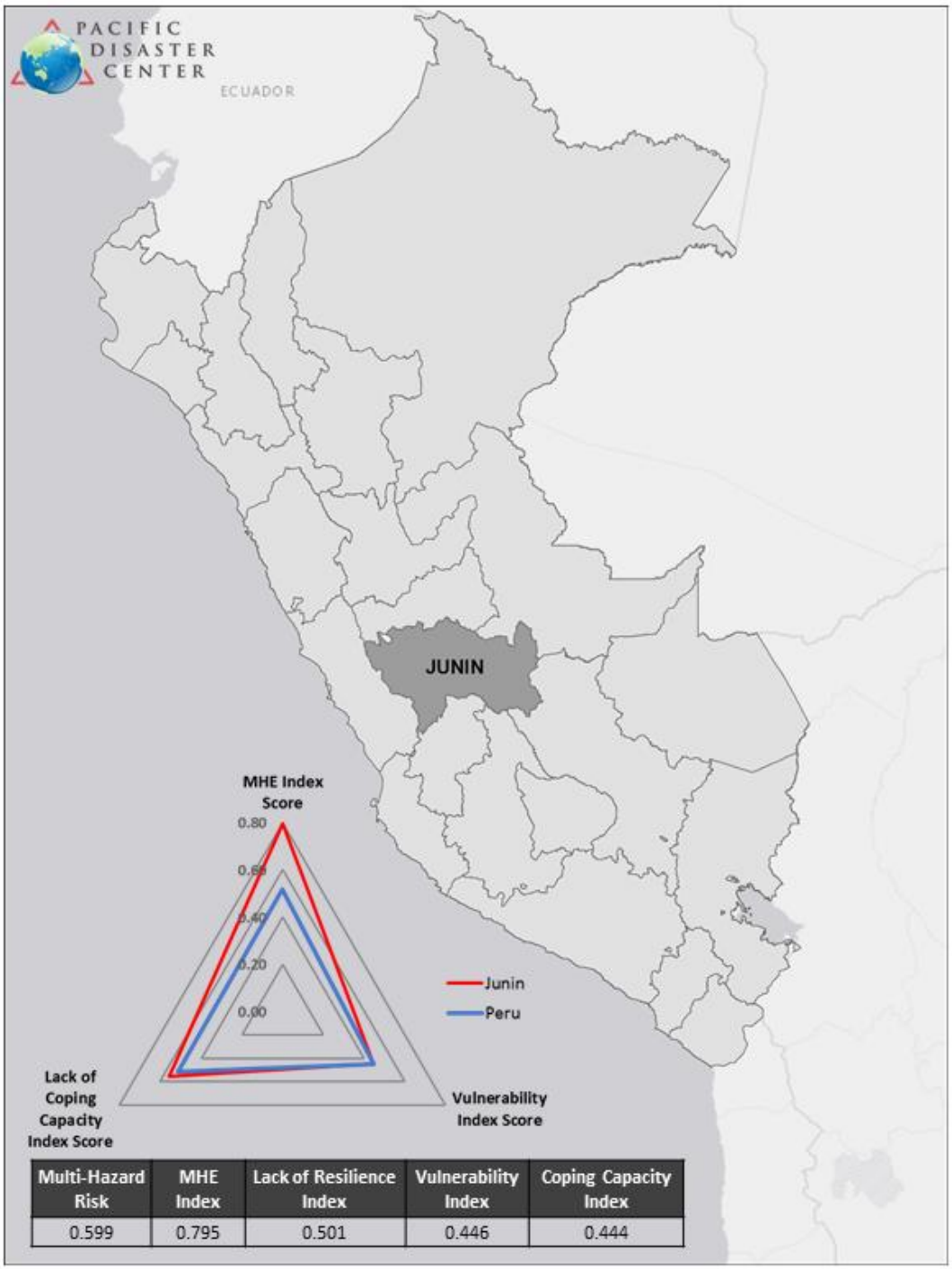
Figure 13. Percent population exposure to hazard type for Cajamarca

Table 6. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Cajamarca

Index	Cajamarca	
	Score	**Rank**
Multi-Hazard Exposure	0.754	3
Subcomponents		
Raw Exposure	0.804	4
Relative Exposure	0.704	9

Junin: Risk

Junin ranks **2 of 25** on the **Multi-Hazard Risk Index** with a score of **0.599**. Junin's score and ranking are due to very high Multi-Hazard Exposure combined with low Coping Capacity and moderate Vulnerability scores. Junin has the 2nd highest MHE in the country, the 12th highest Vulnerability, and the 16th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.599	0.795	0.501	0.446	0.444

Junin: Lack of Resilience

Junin ranks **10 of 25** on the **Lack of Resilience Index** with a score of **0.501**. Junin's score and ranking are due to moderate Vulnerability combined with low Coping Capacity scores. Junin has the 12th highest Vulnerability and the 16th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Junin are: **Governance**, **Economic Capacity**, and **Population Pressures.**

Table 7. Lack of Resilience Index and Component scores for Junin

Index	Junin	
	Score	**Rank**
Lack of Resilience	0.501	10
Components		
Vulnerability	0.446	12
Coping Capacity	0.444	16

Junin: Coping Capacity

Junin's coping capacity is **16th out of 25** with a score of **0.444**. The thematic areas with the weakest relative scores are **Governance**, **Economic Capacity,** and **Health Care Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

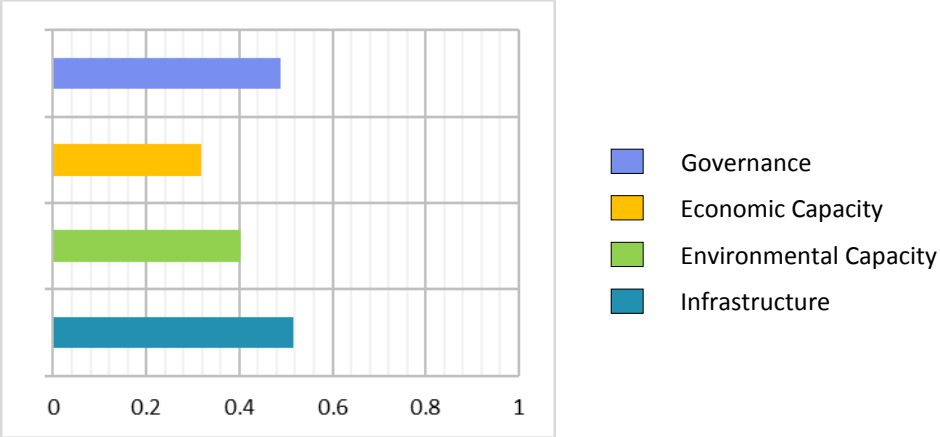


Figure 14. Coping Capacity subcomponents for Junin

Table 8. Coping Capacity Index, subcomponent and sub-index scores for Junin

Index	Junin	
	Score	**Rank**
Coping Capacity	0. 444	16
Subcomponents		
Governance	0. 489	20
Economic Capacity	0. 319	14
Environmental Capacity	0. 404	8
Infrastructure	0. 515	11
Infrastructure Sub-indices		
Health Care	0. 398	13
Transportation	0. 556	10
Communications	0. 590	11

Junin: Vulnerability

Junin ranks **12th out of 25** on the Vulnerability Index with a score of **0.446**. Vulnerability in Junin is strongly influenced by the **Population Pressures** subcomponent score.

Table 9. Vulnerability Index and subcomponent index scores for Junin

Index	Junin	
	Score	**Rank**
Vulnerability	0. 446	12
Subcomponents		
Economic Constraints	0. 488	11
Info Access Vulnerability	0. 464	15
Vulnerable Health Status	0. 415	15
Clean Water Vulnerability	0. 395	15
Population Pressures	0. 714	7
Environmental Stress	0. 327	16
Recent Disaster Impacts	0. 364	13
Gender Inequality	0. 405	17

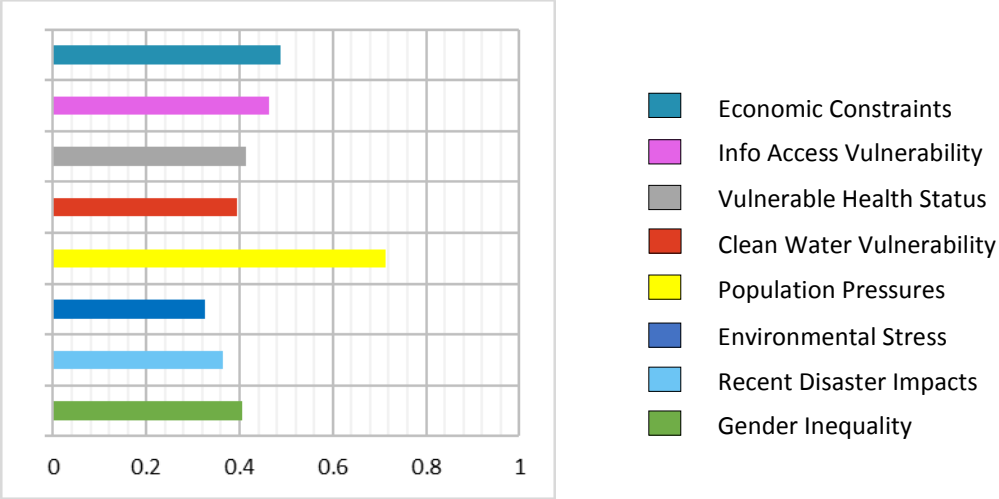


Figure 15. Vulnerability subcomponents for Junin

Junin: Multi-Hazard Exposure

Junin ranks **2nd out of 25** on the MHE index with a score of **0.795**. A large proportion of the population is exposed to **mass movement, flood, seismic activity,** and **low temperature**.

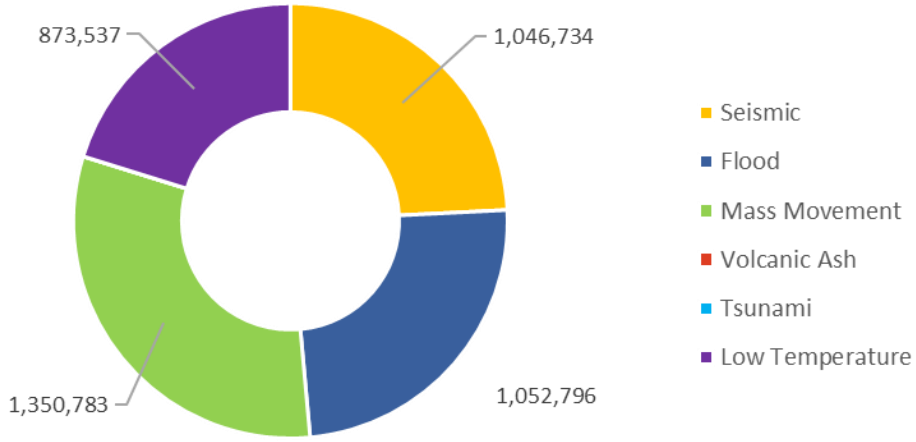


Figure 16. Raw population exposure by hazard type for Junin

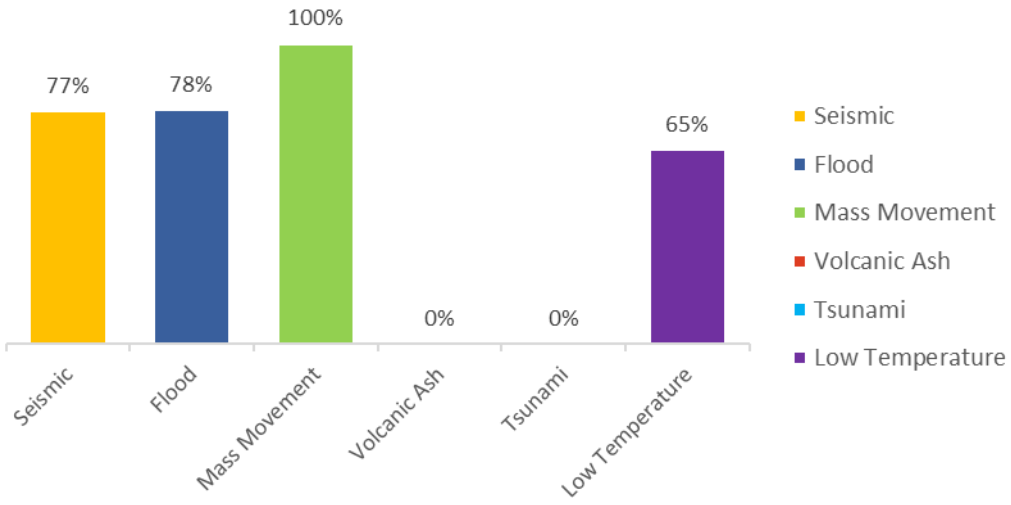


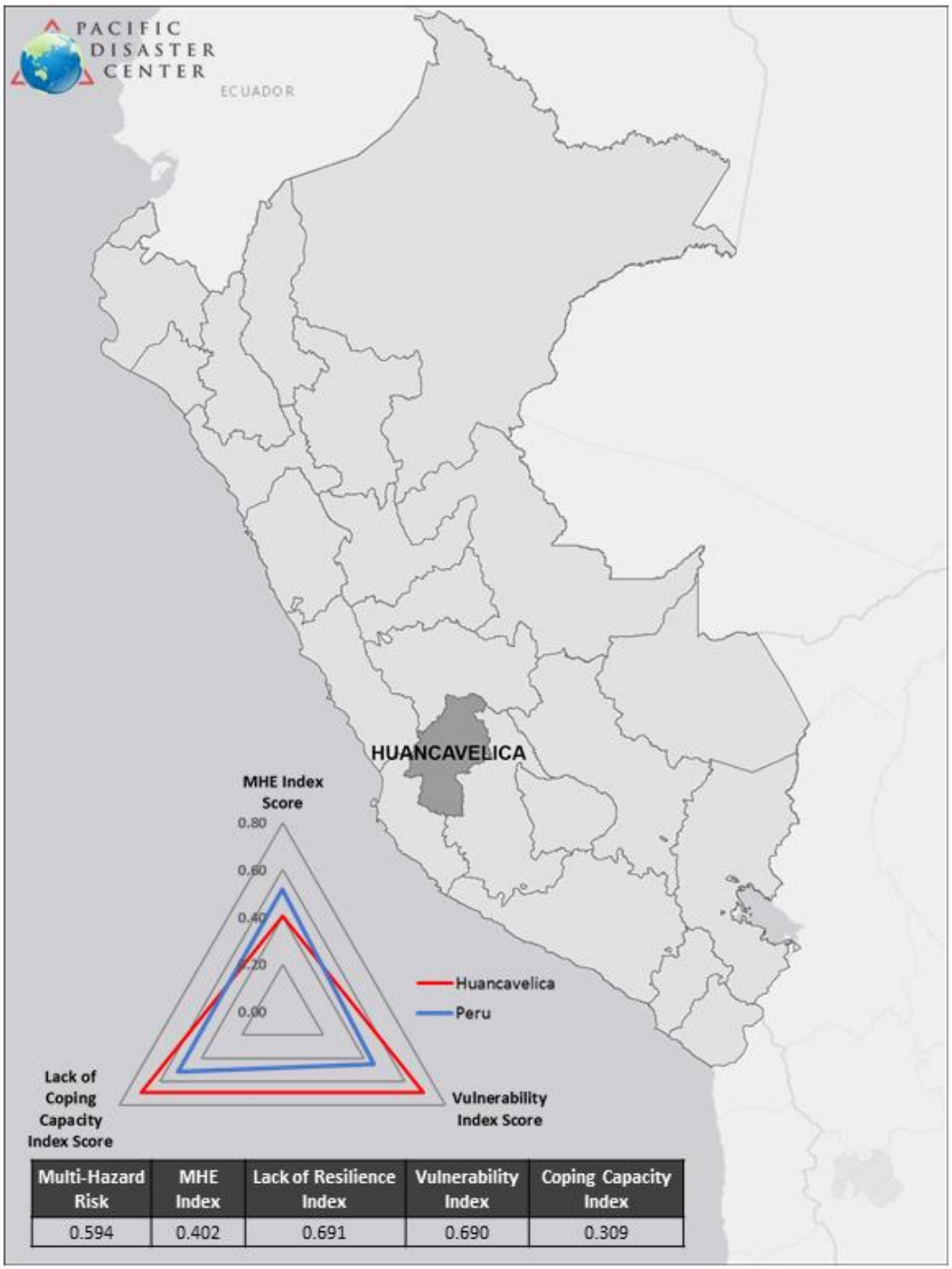
Figure 17. Percent population exposure to hazard type for Junin

Table 10. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Junin

Index	Junin	
	Score	**Rank**
Multi-Hazard Exposure	0. 795	2
Subcomponents		
Raw Exposure	0. 765	5
Relative Exposure	0. 824	5

Huancavelica: Risk

Huancavelica ranks **3 of 25** on the **Multi-Hazard Risk Index** with a score of **0.594**. Huancavelica's score and ranking are driven by very low Coping Capacity combined with very high Vulnerability scores. Huancavelica has the 17th highest MHE in the country, the 1st highest Vulnerability, and the 23rd highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.594	0.402	0.691	0.690	0.309

Huancavelica: Lack of Resilience

Huancavelica ranks **1 of 25** the on **Lack of Resilience Index** with a score of **0.691**. Huancavelica's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. Huancavelica has the 1st highest Vulnerability and the 23rd highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Huancavelica are: **Information Access Vulnerability**, **Economic Capacity**, and **Economic Constraints.**

Table 11. Lack of Resilience Index and Component scores for Huancavelica

Index	Huancavelica	
	Score	**Rank**
Lack of Resilience	0.691	1
Components		
Vulnerability	0.690	1
Coping Capacity	0.309	23

Huancavelica: Coping Capacity

Huancavelica's coping capacity is **23rd out of 25** with a score of **0.309**. The thematic areas with the weakest relative scores are **Environmental Capacity, Economic Capacity,** and **Infrastructure**. These thematic areas appear to constrain Coping Capacity within this region.

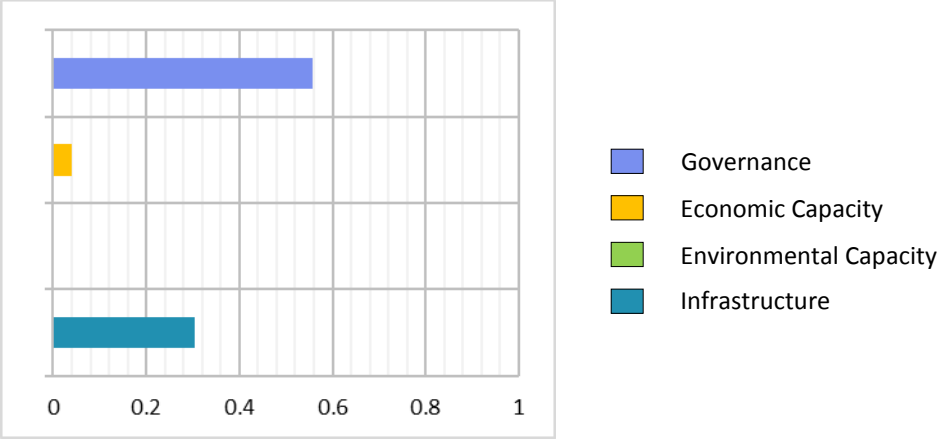


Figure 18. Coping Capacity subcomponents for Huancavelica

Table 12. Coping Capacity Index, subcomponent and sub-index scores for Huancavelica

Index	Huancavelica	
	Score	Rank
Coping Capacity	0. 309	23
Subcomponents		
Governance	0. 556	14
Economic Capacity	0. 040	25
Environmental Capacity	0. 000	23
Infrastructure	0. 305	23
Infrastructure Sub-indices		
Health Care	0. 085	24
Transportation	0. 637	6
Communications	0. 193	25

Huancavelica: Vulnerability

Huancavelica ranks **1st out of 25** on the Vulnerability Index with a score of **0.690**. Vulnerability in Huancavelica is strongly influenced by **Information Access Vulnerability, Economic Constraints, Vulnerable Health Status, Clean Water Vulnerability, Recent Disaster Impacts**, and **Gender Inequality** subcomponent scores.

Table 13. Vulnerability Index and subcomponent index scores for Huancavelica

Index	Huancavelica	
	Score	Rank
Vulnerability	0. 690	1
Subcomponents		
Economic Constraints	0. 823	1
Info Access Vulnerability	0. 916	1
Vulnerable Health Status	0. 751	1
Clean Water Vulnerability	0. 756	3
Population Pressures	0. 393	16
Environmental Stress	0. 477	9
Recent Disaster Impacts	0. 739	2
Gender Inequality	0. 665	2

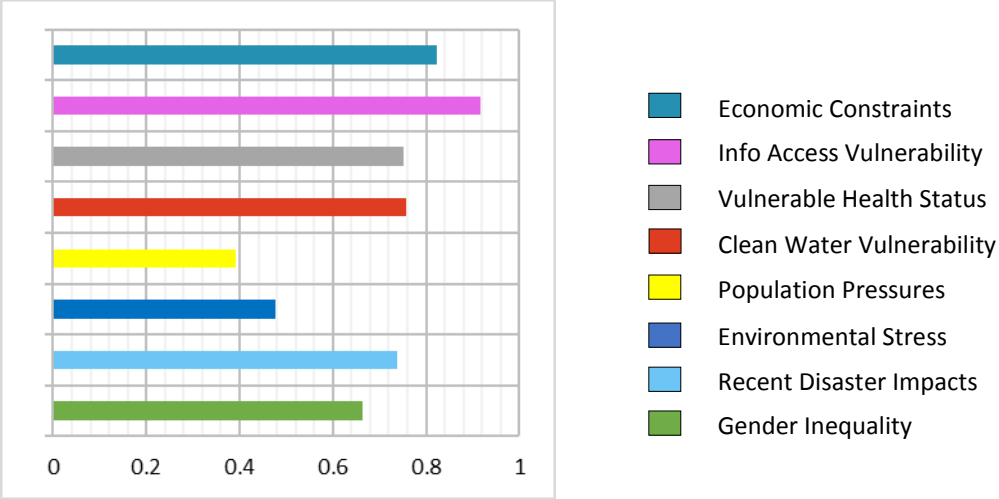


Figure 19. Vulnerability subcomponents for Huancavelica

Huancavelica: Multi-Hazard Exposure

Huancavelica ranks **17th out of 25** on the MHE index with a score of **0.402**. A large proportion of the population is exposed to **mass movement, low temperature, seismic activity,** and **flood**.

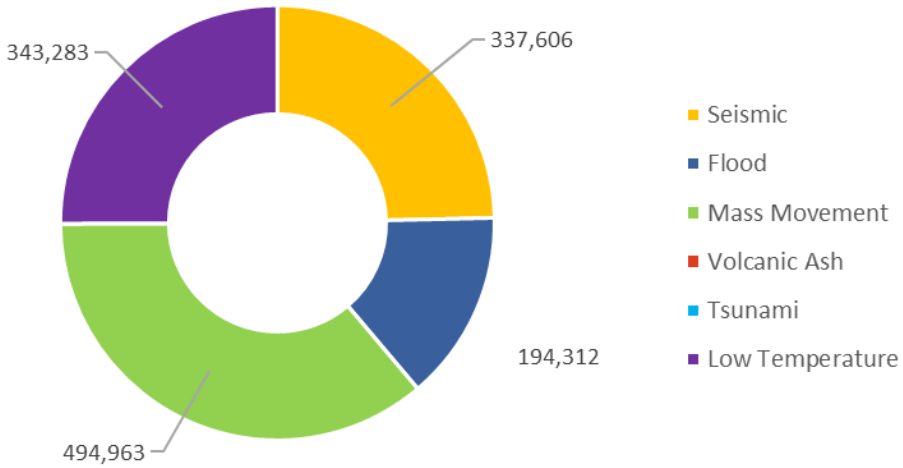


Figure 20. Raw population exposure by hazard type for Huancavelica

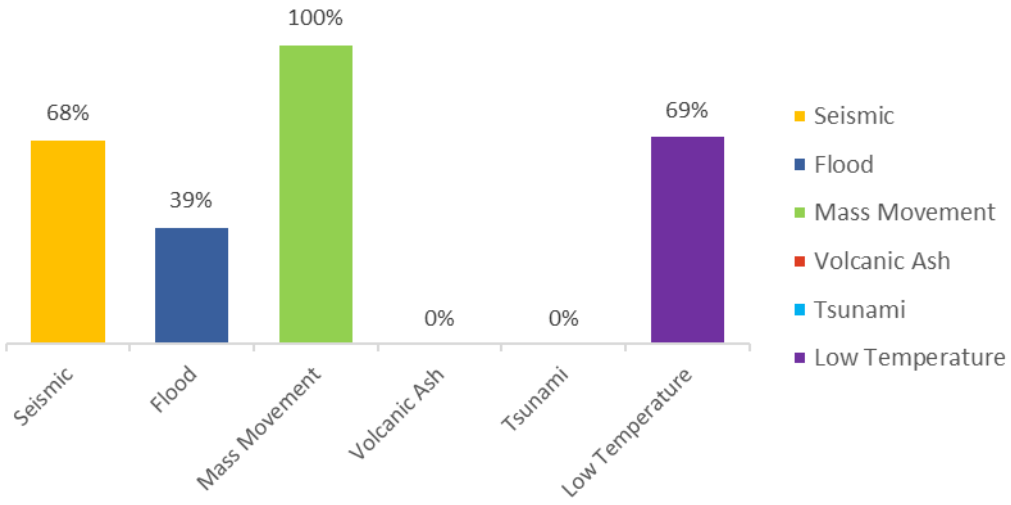


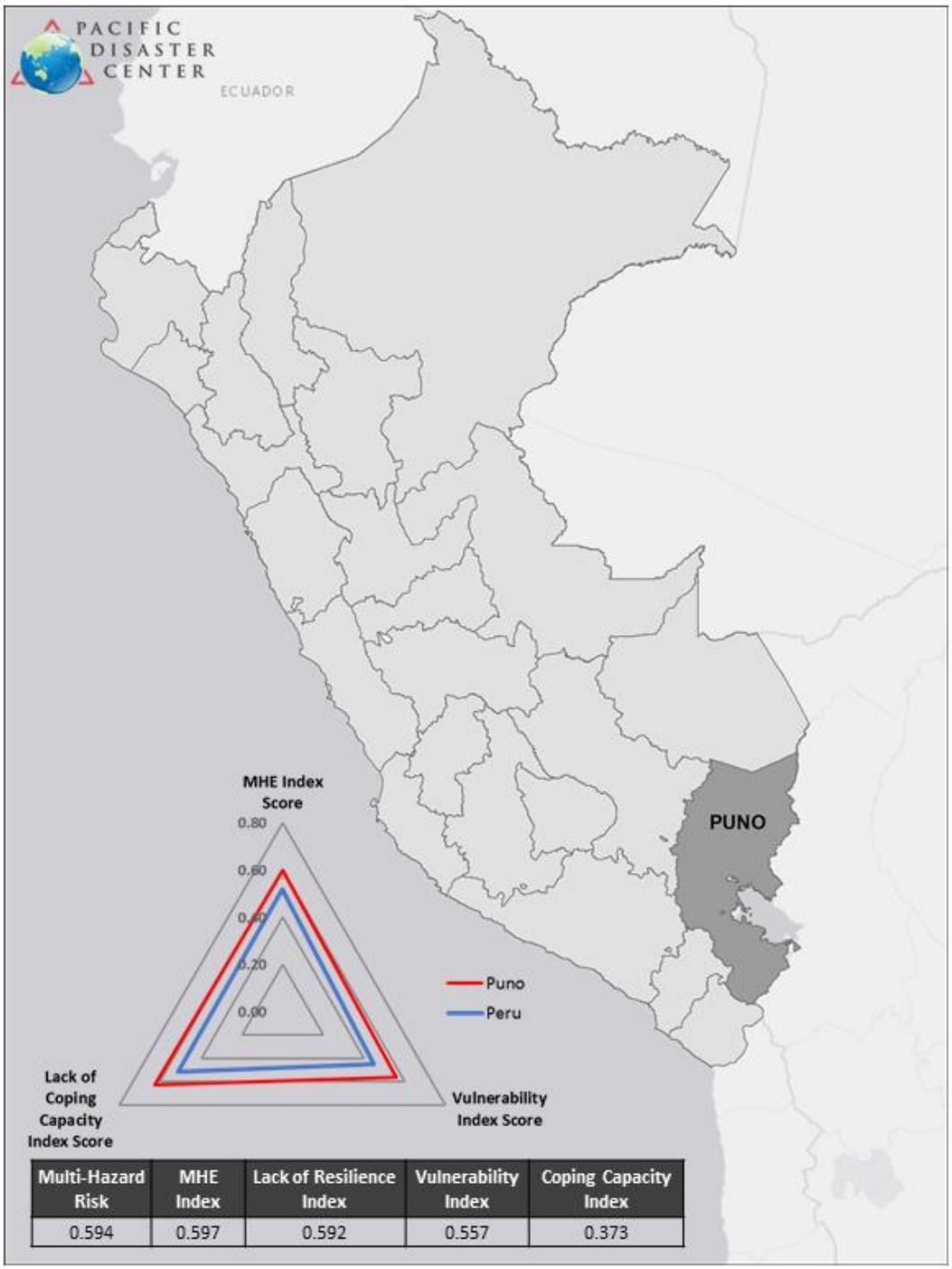
Figure 21. Percent population exposure to hazard type for Huancavelica

Table 14. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Huancavelica

Index	Huancavelica	
	Score	**Rank**
Multi-Hazard Exposure	0. 402	17
Subcomponents		
Raw Exposure	0. 195	16
Relative Exposure	0. 608	15

Puno: Risk

Puno ranks **4 of 25** on the **Multi-Hazard Risk Index** with a score of **0.594**. Puno's score and ranking are due to moderate Multi-Hazard Exposure combined with very low Coping Capacity and very high Vulnerability scores. Puno has the 12th highest MHE in the country, the 4th highest Vulnerability, and the 22nd highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.594	0.597	0.592	0.557	0.373

Puno: Lack of Resilience

Puno ranks **4 of 25** on the **Lack of Resilience Index** with a score of **0.592**. Puno's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. Puno has the 4th highest Vulnerability and the 22nd highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Puno are: **Vulnerable Health Status, Clean Water Vulnerability**, and **Economic Capacity.**

Table 15. Lack of Resilience Index and Component scores for Puno

Index	Puno	
	Score	**Rank**
Lack of Resilience	0.592	4
Components		
Vulnerability	0.557	4
Coping Capacity	0.373	22

Puno: Coping Capacity

Puno's coping capacity is **22nd out of 25** with a score of **0.373**. The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure**. These thematic areas appear to constrain Coping Capacity within this region.

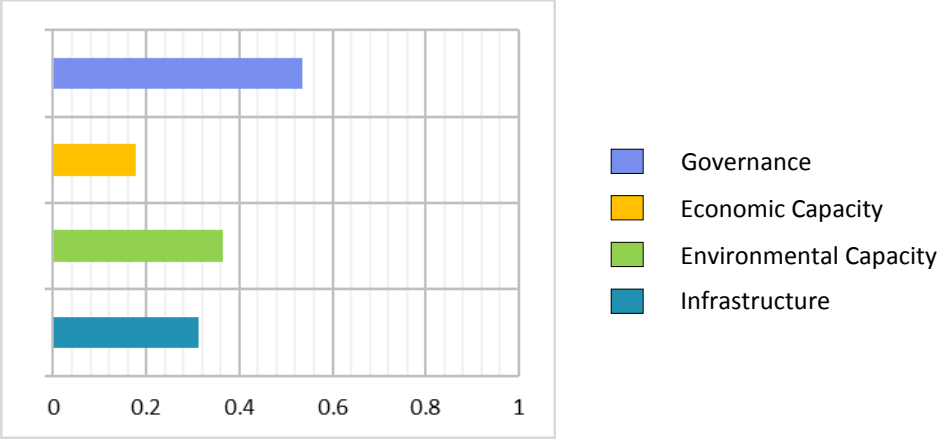


Figure 22. Coping Capacity subcomponents for Puno

Table 16. Coping Capacity Index, subcomponent and sub-index scores for Puno

Index	Puno	
	Score	Rank
Coping Capacity	0. 373	22
Subcomponents		
Governance	0. 535	16
Economic Capacity	0. 177	19
Environmental Capacity	0. 366	9
Infrastructure	0. 312	20
Infrastructure Sub-indices		
Health Care	0. 202	20
Transportation	0. 431	19
Communications	0. 304	20

Puno: Vulnerability

Puno ranks **4th out of 25** on the Vulnerability Index with a score of **0.557**. Vulnerability in Puno is strongly influenced by **Vulnerable Health Status, Clean Water Vulnerability, Recent Disaster Impacts,** and **Information Access Vulnerability** subcomponent scores.

Table 17. Vulnerability Index and subcomponent index scores for Puno

Index	Puno	
	Score	Rank
Vulnerability	0. 557	4
Subcomponents		
Economic Constraints	0. 552	8
Info Access Vulnerability	0. 655	6
Vulnerable Health Status	0. 744	2
Clean Water Vulnerability	0. 723	4
Population Pressures	0. 474	13
Environmental Stress	0. 046	22
Recent Disaster Impacts	0. 659	6
Gender Inequality	0. 603	6

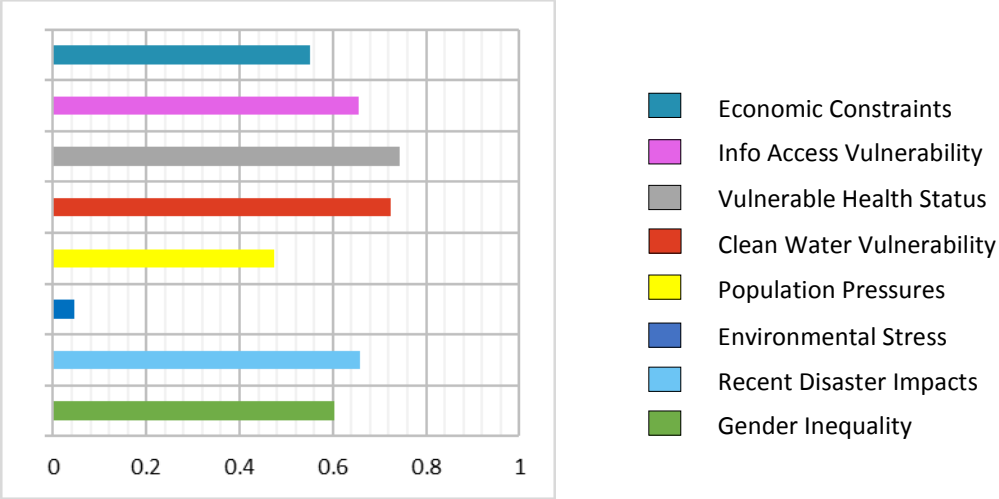


Figure 23. Vulnerability subcomponents for Puno

Puno: Multi-Hazard Exposure

Puno ranks **12th out of 25** on the MHE index with a score of **0.597**. A large proportion of the population is exposed to **mass movement, low temperature, seismic activity,** and **flood**. Though Puno is also exposed to volcanic ash, it affects a relatively small proportion of the population.

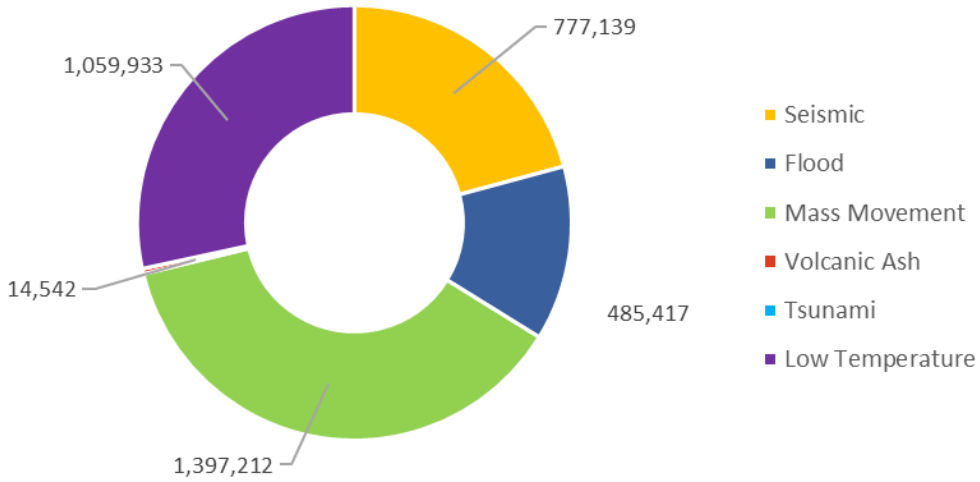


Figure 24. Raw population exposure by hazard type for Puno

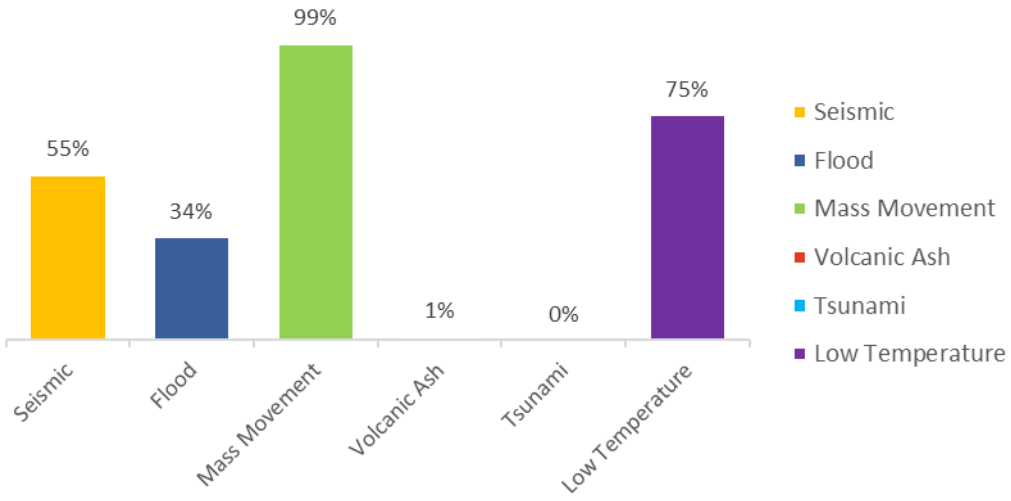


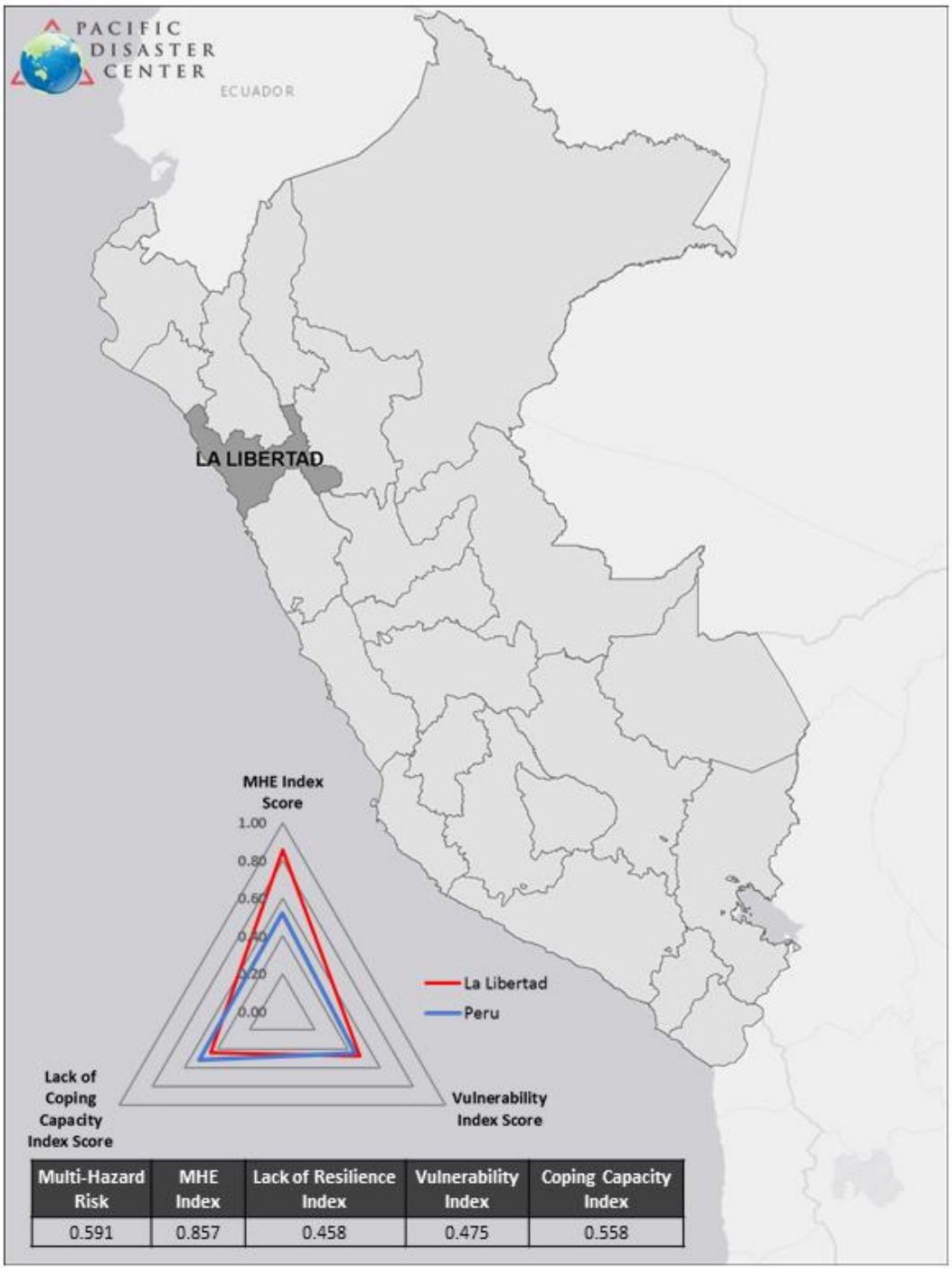
Figure 25. Percent population exposure to hazard type for Puno

Table 18. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Puno

Index	Puno	
	Score	**Rank**
Multi-Hazard Exposure	0. 597	12
Subcomponents		
Raw Exposure	0. 651	8
Relative Exposure	0. 543	17

La Libertad: Risk

La Libertad ranks **5 of 25** on the **Multi-Hazard Risk Index** with a score of **0.591**. La Libertad's score and ranking are driven by a combination of very high Multi-Hazard Exposure with high Vulnerability scores. La Libertad has the 1st highest MHE in the country, the 10th highest Vulnerability, and the 6th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.591	0.857	0.458	0.475	0.558

La Libertad: Lack of Resilience

La Libertad ranks **16 of 25** on the **Lack of Resilience Index** with a score of **0.458**. La Libertad's score and ranking are due to high Vulnerability combined with high Coping Capacity scores. La Libertad has the 10th highest Vulnerability and the 6th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of La Libertad are: **Environmental Stress, Environmental Capacity**, and **Population Pressures.**

Table 19. Lack of Resilience Index and Component scores for La Libertad

Index	La Libertad	
	Score	**Rank**
Lack of Resilience	0.458	16
Components		
Vulnerability	0.475	10
Coping Capacity	0.558	6

La Libertad: Coping Capacity

La Libertad's coping capacity is **6th out of 25** with a score of **0.558**. The thematic areas with the weakest relative scores are **Environmental Capacity** and **Economic Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

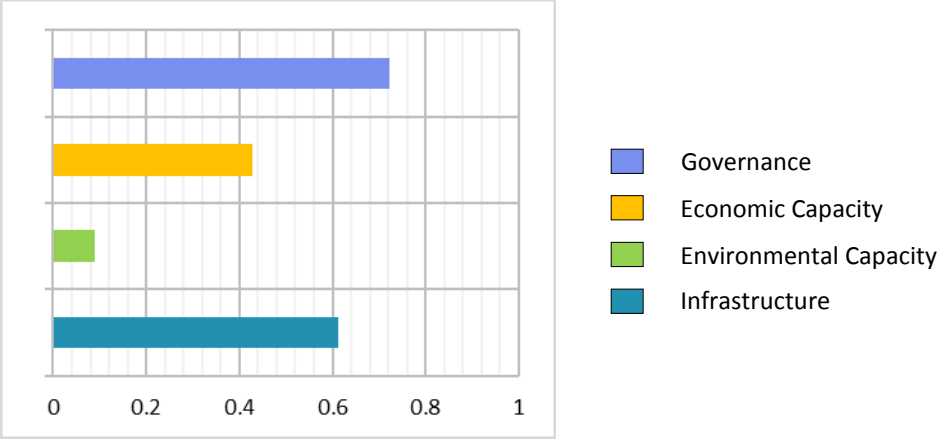


Figure 26. Coping Capacity subcomponents for La Libertad

Table 20. Coping Capacity Index, subcomponent and sub-index scores for La Libertad

Index	La Libertad	
	Score	**Rank**
Coping Capacity	0. 558	6
Subcomponents		
Governance	0. 723	4
Economic Capacity	0. 427	12
Environmental Capacity	0. 090	18
Infrastructure	0. 612	7
Infrastructure Sub-indices		
Health Care	0. 484	10
Transportation	0. 606	8
Communications	0. 744	6

La Libertad: Vulnerability

La Libertad ranks **10th out of 25** on the Vulnerability Index with a score of **0.475**. Vulnerability in La Libertad is strongly influenced by **Environmental Stress** and **Population Pressures** subcomponent scores.

Table 21. Vulnerability Index and subcomponent index scores for La Libertad

Index	La Libertad	
	Score	**Rank**
Vulnerability	0. 475	10
Subcomponents		
Economic Constraints	0. 486	12
Info Access Vulnerability	0. 486	14
Vulnerable Health Status	0. 313	21
Clean Water Vulnerability	0. 254	17
Population Pressures	0. 766	6
Environmental Stress	0. 813	2
Recent Disaster Impacts	0. 196	20
Gender Inequality	0. 486	15

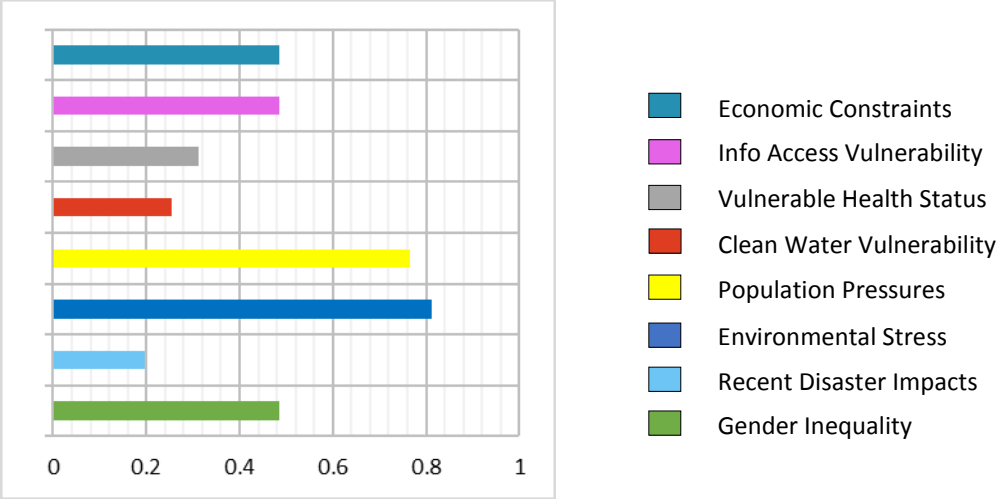


Figure 27. Vulnerability subcomponents for La Libertad

La Libertad: Multi-Hazard Exposure

La Libertad ranks **1st out of 25** on the MHE index with a score of **0.857**. Both a very large number of people and significant proportion of the population are exposed to **low temperature**, **seismic activity, mass movement, flood,** and **tsunami**.

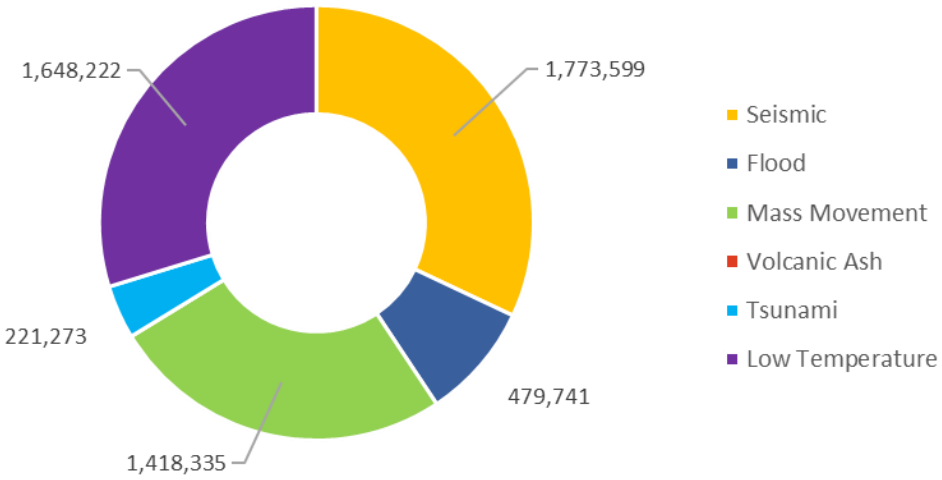


Figure 28. Raw population exposure by hazard type for La Libertad

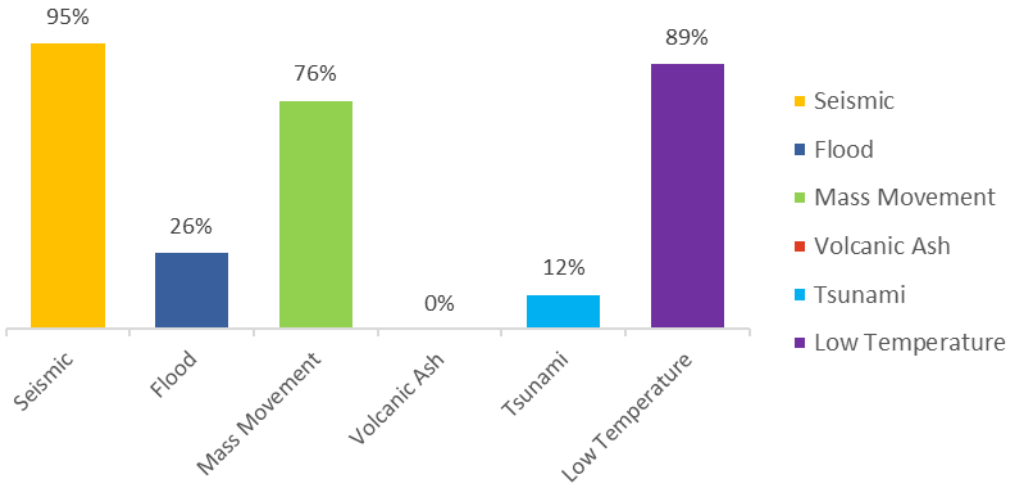


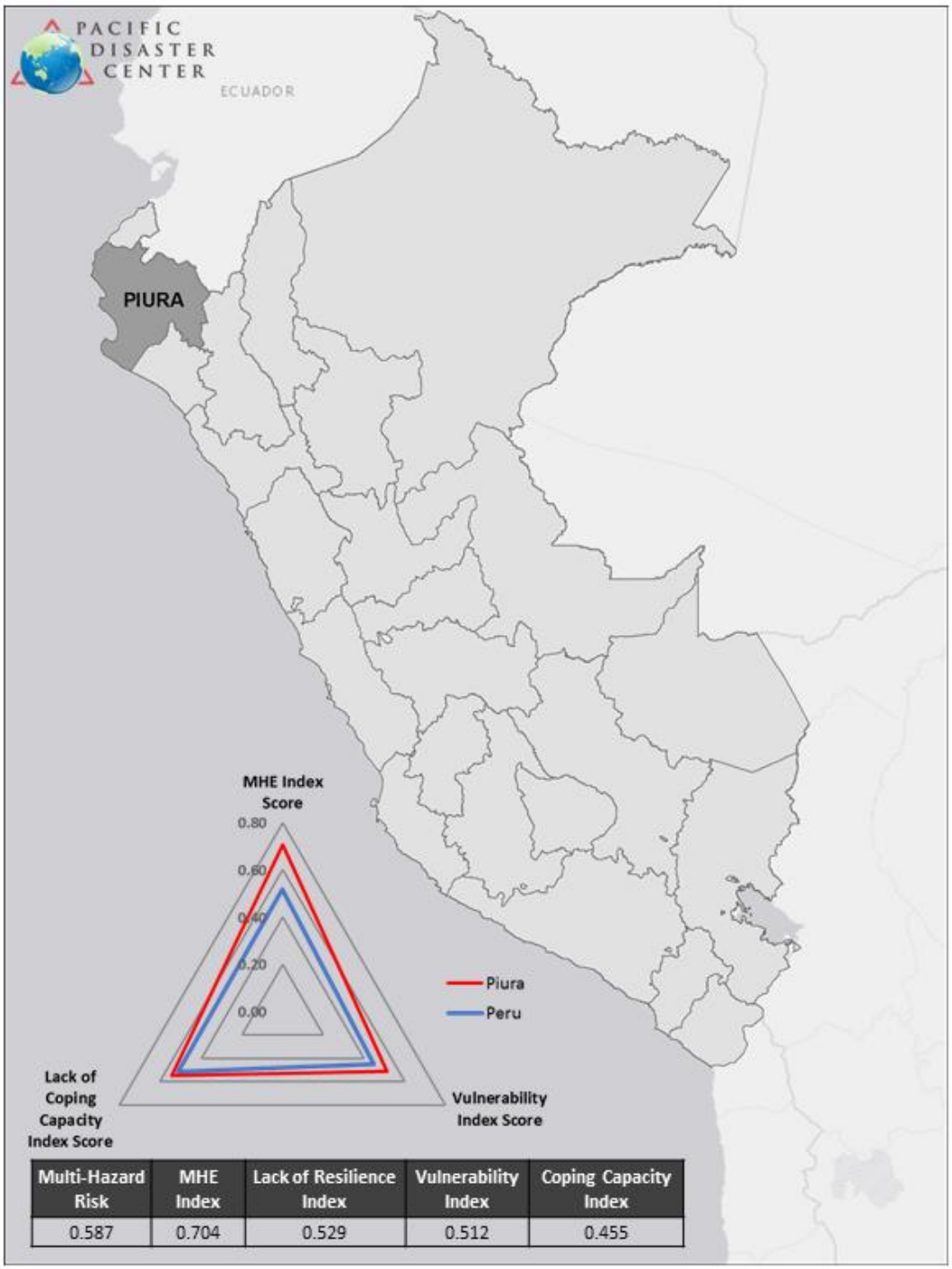
Figure 29. Percent population exposure to hazard type for La Libertad

Table 22. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for La Libertad

Index	La Libertad	
	Score	**Rank**
Multi-Hazard Exposure	0. 857	1
Subcomponents		
Raw Exposure	1. 000	1
Relative Exposure	0. 714	8

Piura: Risk

Piura ranks **6 of 25** on the **Multi-Hazard Risk Index** with a score of **0.587**. Piura's score and ranking are due to high Multi-Hazard Exposure combined with moderate Coping Capacity and high Vulnerability scores. Piura has the 6th highest MHE in the country, the 7th highest Vulnerability, and the 15th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.587	0.704	0.529	0.512	0.455

Piura: Lack of Resilience

Piura ranks **8 of 25** on the **Lack of Resilience Index** with a score of **0.529**. Piura's score and ranking are due to high Vulnerability combined with moderate Coping Capacity scores. Piura has the 7th highest Vulnerability and the 15th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Piura are: **Environmental Stress**, **Gender Inequality**, and **Health Care Capacity.**

Table 23. Lack of Resilience Index and Component scores for Piura

Index	Piura	
	Score	**Rank**
Lack of Resilience	0.529	8
Components		
Vulnerability	0.512	7
Coping Capacity	0.455	15

Piura: Coping Capacity

Piura's coping capacity is **15th out of 25** with a score of **0.455**. The thematic areas with the weakest relative scores are **Health Care Capacity, Environmental Capacity,** and **Economic Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

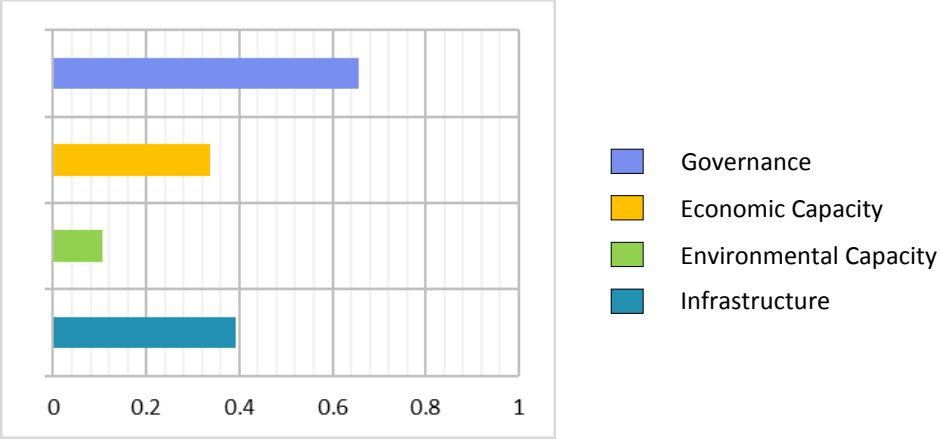


Figure 30. Coping Capacity subcomponents for Piura

Table 24. Coping Capacity Index, subcomponent and sub-index scores for Piura

Index	Piura	
	Score	**Rank**
Coping Capacity	0. 455	15
Subcomponents		
Governance	0. 657	10
Economic Capacity	0. 336	13
Environmental Capacity	0. 107	16
Infrastructure	0. 391	17
Infrastructure Sub-indices		
Health Care	0. 150	21
Transportation	0. 460	15
Communications	0. 564	13

Piura: Vulnerability

Piura ranks **7th out of 25** on the Vulnerability Index with a score of **0.512**. Vulnerability in Piura is strongly influenced by **Environmental Stress, Gender Inequality,** and **Economic Constraints** subcomponent scores.

Table 25. Vulnerability Index and subcomponent index scores for Piura

Index	Piura	
	Score	**Rank**
Vulnerability	0. 512	7
Subcomponents		
Economic Constraints	0. 623	4
Info Access Vulnerability	0. 527	11
Vulnerable Health Status	0. 429	13
Clean Water Vulnerability	0. 464	11
Population Pressures	0. 400	15
Environmental Stress	0. 766	3
Recent Disaster Impacts	0. 249	18
Gender Inequality	0. 640	3

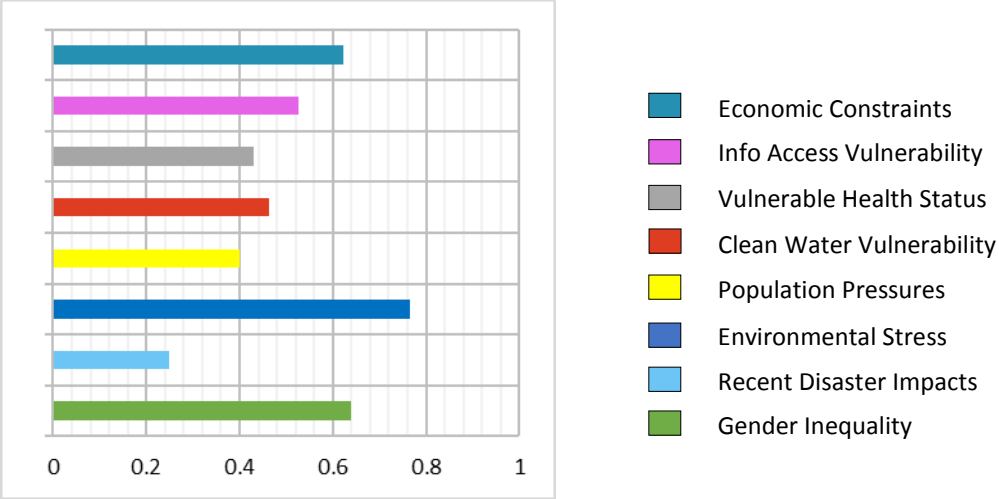


Figure 31. Vulnerability subcomponents for Piura

Piura: Multi-Hazard Exposure

Piura ranks **6th out of 25** on the MHE index with a score of **0.704**. Both a large number of people and a significant proportion of the region population are exposed to **seismic activity**, **mass movement, flood**, **low temperature,** and **tsunami**.

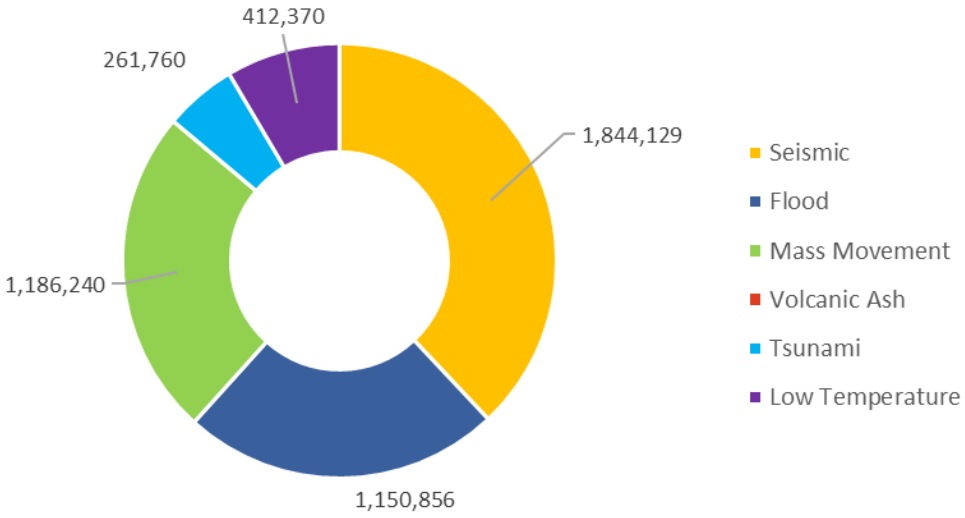


Figure 32. Raw population exposure by hazard type for Piura

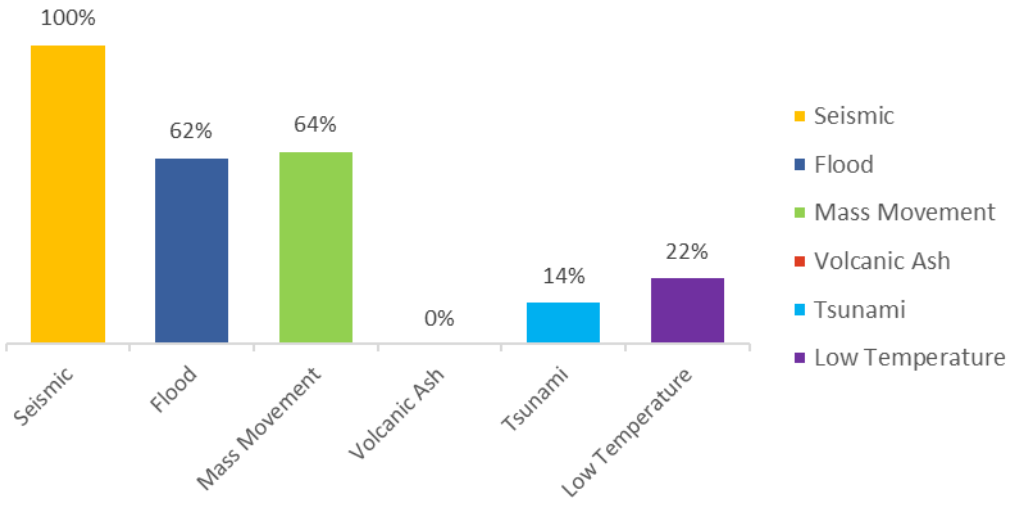


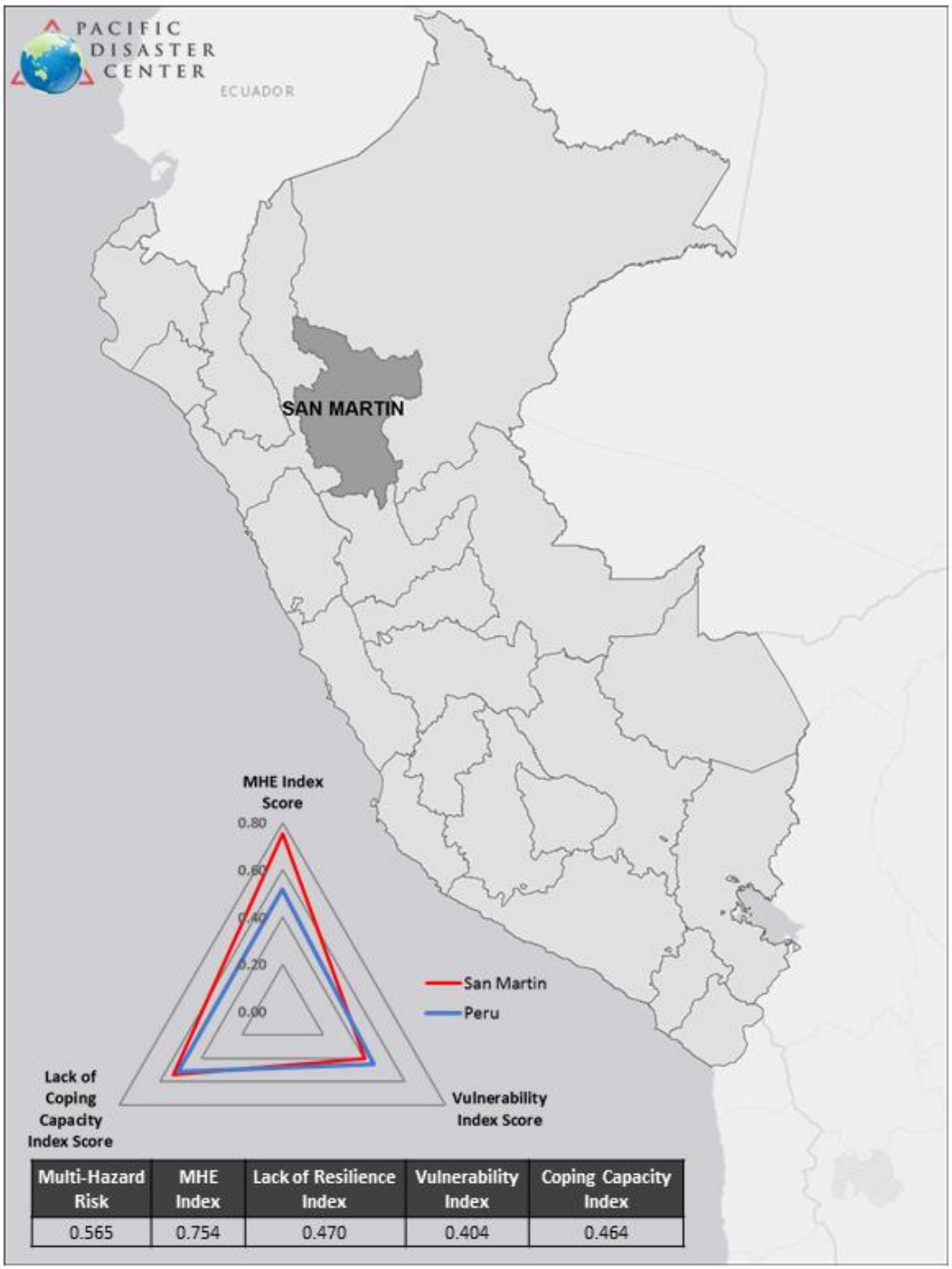
Figure 33. Percent population exposure to hazard type for Piura

Table 26. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Piura

Index	Piura	
	Score	**Rank**
Multi-Hazard Exposure	0. 704	6
Subcomponents		
Raw Exposure	0. 868	3
Relative Exposure	0. 541	18

San Martin: Risk

San Martin ranks **7 of 25** on the **Multi-Hazard Risk Index** with a score of **0.565**. San Martin's score and ranking are driven primarily by a combination of very high Multi-Hazard Exposure with moderate Coping Capacity scores. San Martin has the 4th highest MHE in the country, the 16th highest Vulnerability, and the 14th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.565	0.754	0.470	0.404	0.464

San Martin: Lack of Resilience

San Martin ranks **14 of 25** on the **Lack of Resilience Index** with a score of **0.470**. San Martin's score and ranking are due to low Vulnerability combined with moderate Coping Capacity scores. San Martin has the 16th highest Vulnerability and the 14th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of San Martin are: **Infrastructure**, **Economic Capacity**, and **Gender Inequality.**

Table 27. Lack of Resilience Index and Component scores for San Martin

Index	San Martin	
	Score	**Rank**
Lack of Resilience	0.470	14
Components		
Vulnerability	0.404	16
Coping Capacity	0.464	14

San Martin: Coping Capacity

San Martin's coping capacity is **14th out of 25** with a score of **0.464**. The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure**. These thematic areas appear to constrain Coping Capacity within this region.

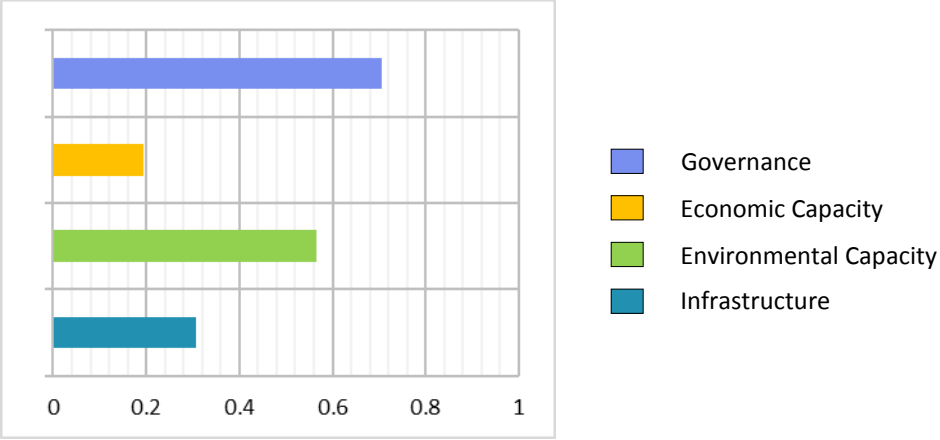


Figure 34. Coping Capacity subcomponents for San Martin

Table 28. Coping Capacity Index, subcomponent and sub-index scores for San Martin

Index	San Martin	
	Score	**Rank**
Coping Capacity	0. 464	14
Subcomponents		
Governance	0. 706	5
Economic Capacity	0. 193	18
Environmental Capacity	0. 565	5
Infrastructure	0. 308	21
Infrastructure Sub-indices		
Health Care	0. 123	23
Transportation	0. 351	22
Communications	0. 450	17

San Martin: Vulnerability

San Martin ranks **16th out of 25** on the Vulnerability Index with a score of **0.404**. Vulnerability in San Martin is influenced by **Gender Inequality, Clean Water Vulnerability,** and **Information Access Vulnerability** subcomponent scores.

Table 29. Vulnerability Index and subcomponent index scores for San Martin

Index	San Martin	
	Score	**Rank**
Vulnerability	0. 404	16
Subcomponents		
Economic Constraints	0. 444	16
Info Access Vulnerability	0. 591	9
Vulnerable Health Status	0. 425	14
Clean Water Vulnerability	0. 622	8
Population Pressures	0. 000	25
Environmental Stress	0. 135	20
Recent Disaster Impacts	0. 409	12
Gender Inequality	0. 607	5

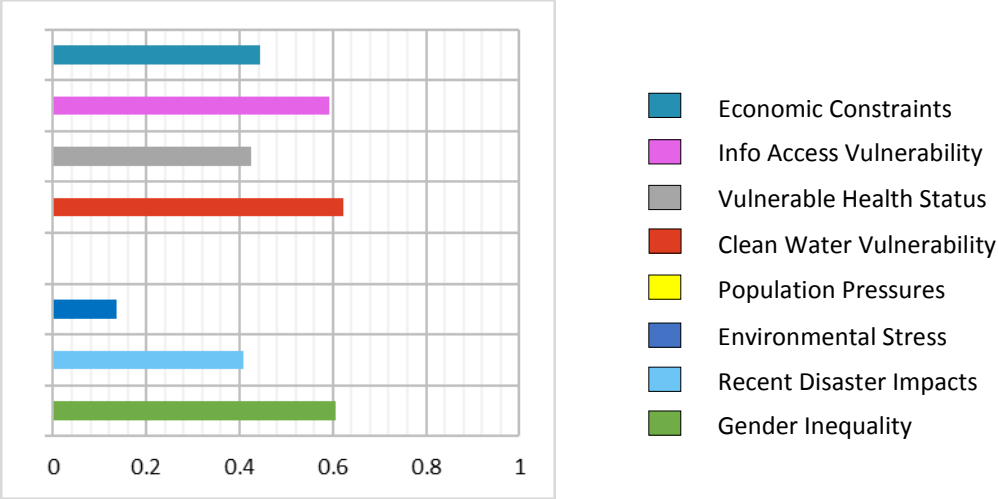


Figure 35. Vulnerability subcomponents for San Martin

San Martin: Multi-Hazard Exposure

San Martin ranks **4th out of 25** on the MHE index with a score of **0.754**. A very large proportion of the population is exposed to **mass movement**, **seismic activity, flood,** and **low temperature**.

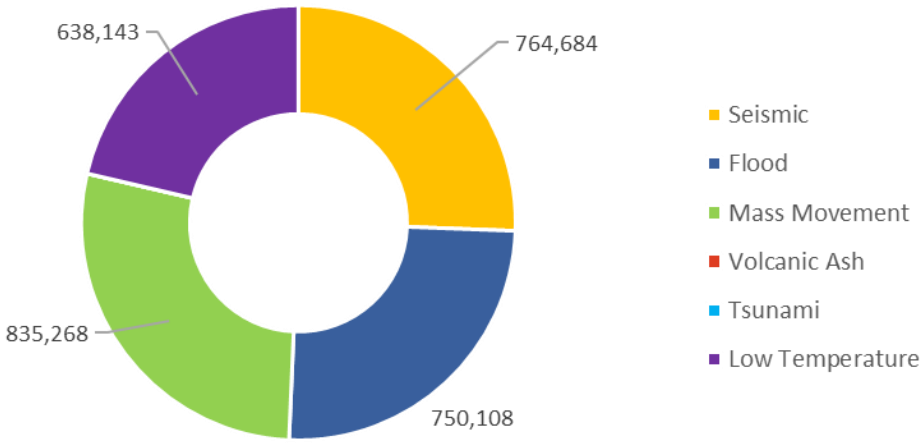


Figure 36. Raw population exposure by hazard type for San Martin

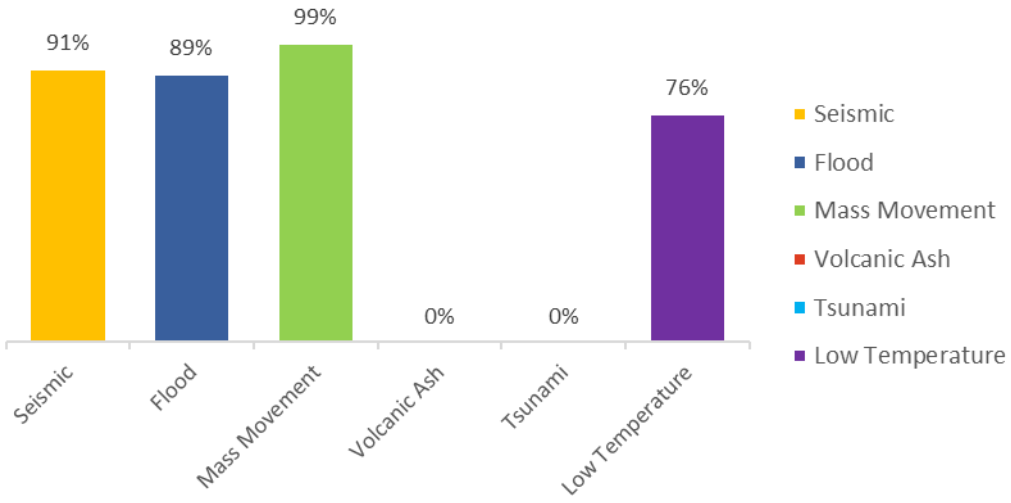


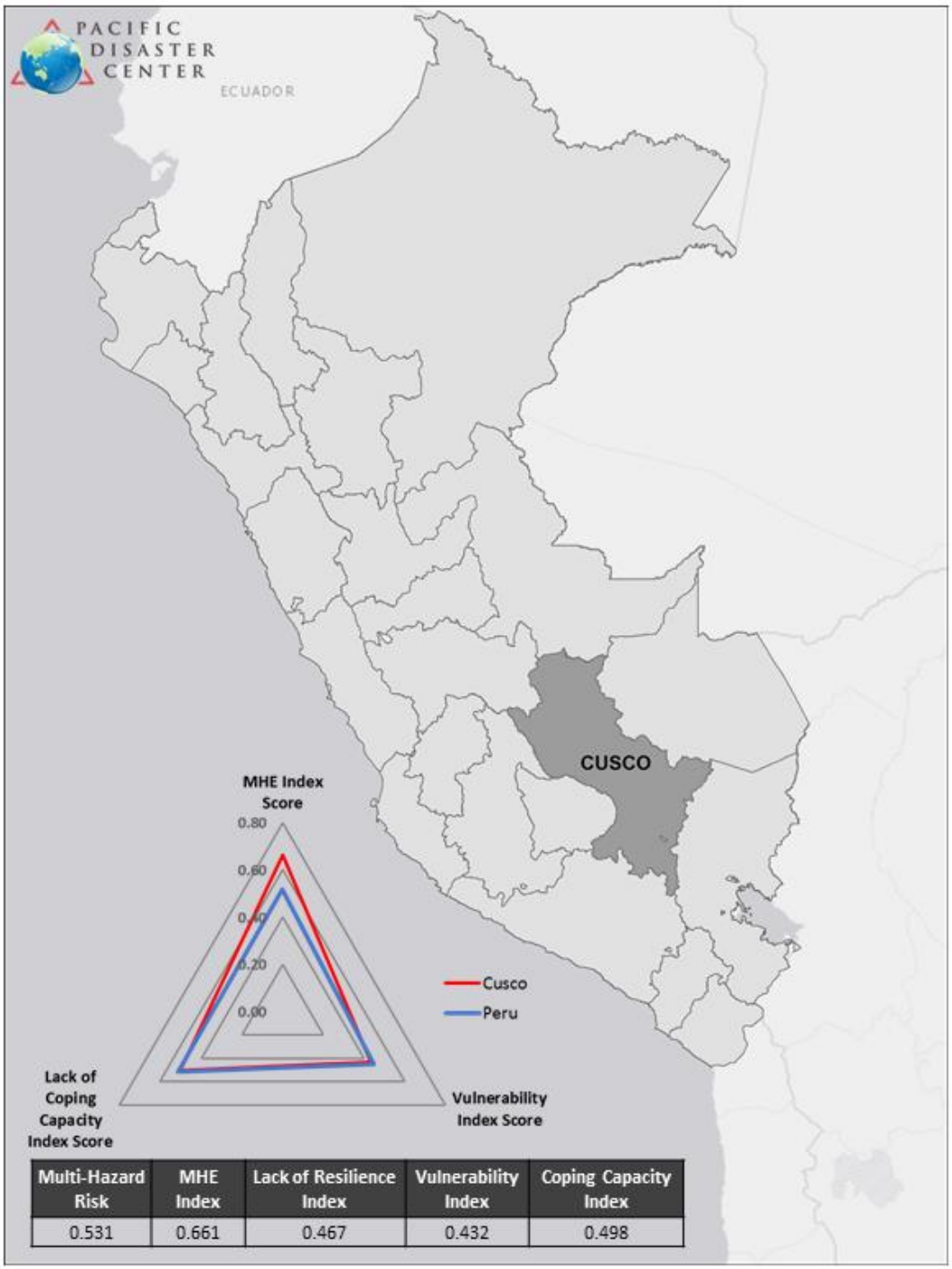
Figure 37. Percent population exposure to hazard type for San Martin

Table 30. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for San Martin

Index	San Martin	
	Score	**Rank**
Multi-Hazard Exposure	0. 754	4
Subcomponents		
Raw Exposure	0. 507	12
Relative Exposure	1. 000	1

Cusco: Risk

Cusco ranks **8 of 25** on the **Multi-Hazard Risk Index** with a score of **0.531**. Cusco's score and ranking are due to high Multi-Hazard Exposure combined with moderate Coping Capacity and moderate Vulnerability scores. Cusco has the 10rd highest MHE in the country, the 13th highest Vulnerability, and the 11th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.531	0.661	0.467	0.432	0.498

Cusco: Lack of Resilience

Cusco ranks **15 of 25** on the **Lack of Resilience Index** with a score of **0.467**. Cusco's score and ranking are due to moderate Vulnerability combined with moderate Coping Capacity scores. Cusco has the 13th highest Vulnerability and the 11th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Cusco are: **Vulnerable Heath Status**, **Recent Disaster Impacts**, and **Environmental Capacity.**

Table 31. Lack of Resilience Index and Component scores for Cusco

Index	Cusco	
	Score	**Rank**
Lack of Resilience	0.467	15
Components		
Vulnerability	0.432	13
Coping Capacity	0.498	11

Cusco: Coping Capacity

Cusco's coping capacity is **19th out of 25** with a score of **0.412**. The thematic areas with the weakest relative scores are **Environmental Capacity, Infrastructure,** and **Governance**. These thematic areas appear to constrain Coping Capacity within this region.

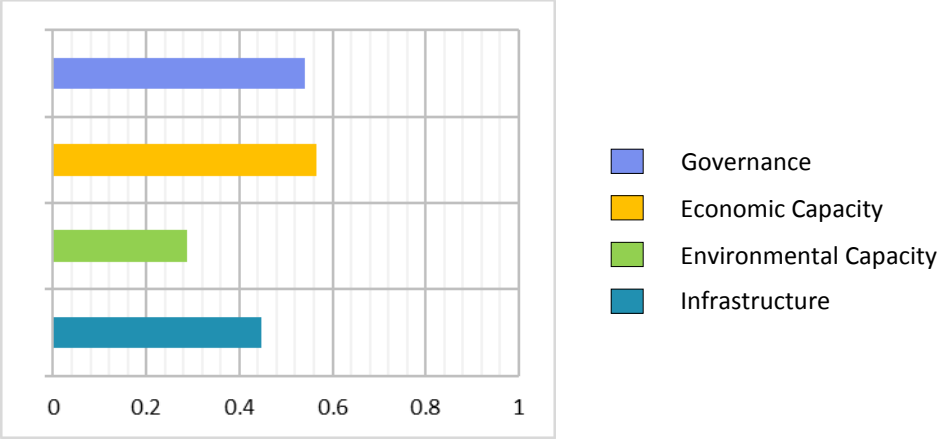


Figure 38. Coping Capacity subcomponents for Cusco

Table 32 Coping Capacity Index, subcomponent and sub-index scores for Cusco

Index	Cusco	
	Score	Rank
Coping Capacity	0. 498	11
Subcomponents		
Governance	0. 541	15
Economic Capacity	0. 566	8
Environmental Capacity	0. 289	13
Infrastructure	0. 446	14
Infrastructure Sub-indices		
Health Care	0. 424	12
Transportation	0. 449	16
Communications	0. 465	14

Cusco: Vulnerability

Cusco ranks **11th out of 25** on the Vulnerability Index with a score of **0.498**. Vulnerability in Cusco is influenced by **Vulnerable Health Status** and **Recent Disaster Impacts** subcomponent scores.

Table 33. Vulnerability Index and subcomponent index scores for Cusco

Index	Cusco	
	Score	Rank
Vulnerability	0. 432	13
Subcomponents		
Economic Constraints	0. 451	15
Info Access Vulnerability	0. 459	16
Vulnerable Health Status	0. 556	5
Clean Water Vulnerability	0. 350	16
Population Pressures	0. 244	19
Environmental Stress	0. 330	14
Recent Disaster Impacts	0. 558	8
Gender Inequality	0. 504	13

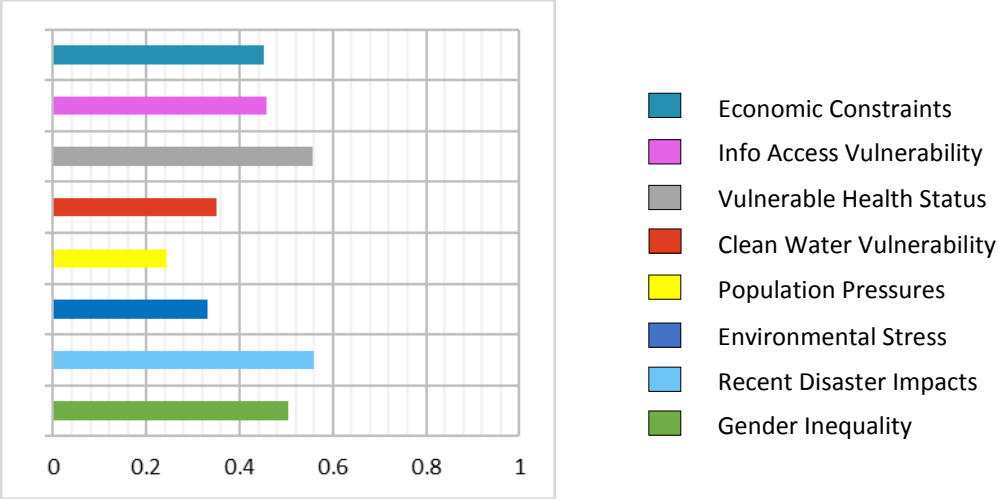


Figure 39. Vulnerability subcomponents for Cusco

Cusco: Multi-Hazard Exposure

Cusco ranks **10th out of 25** on the MHE index with a score of **0.661**. A large proportion of the population is exposed to **mass movement, seismic activity, flood,** and **low temperature**.

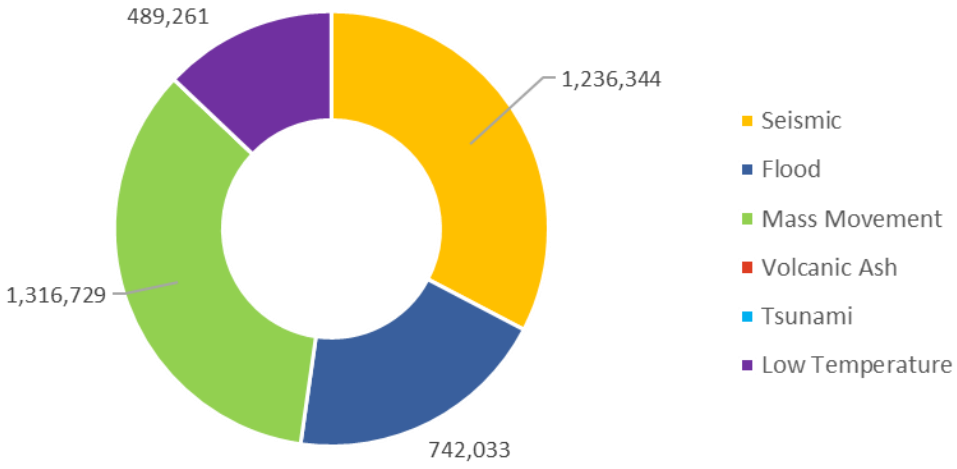


Figure 40. Raw population exposure by hazard type for Cusco

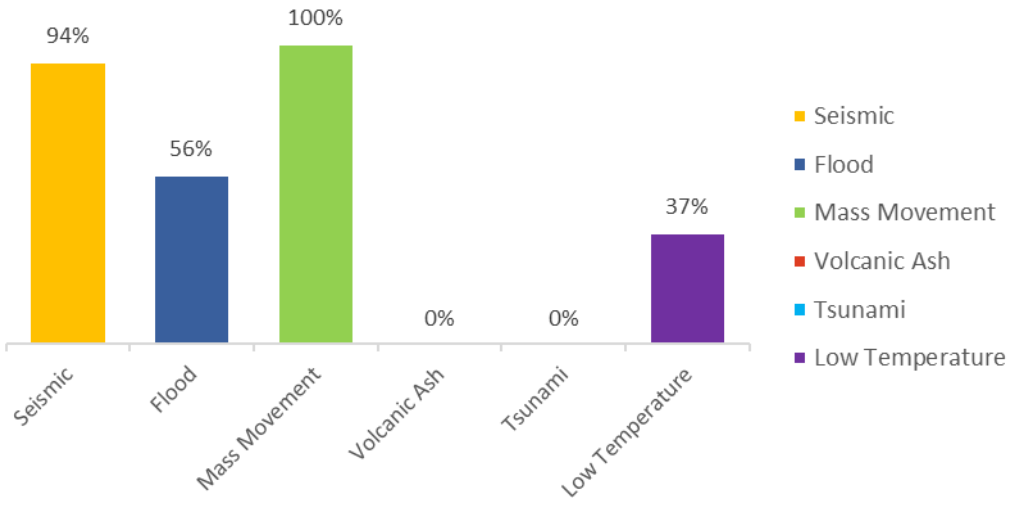


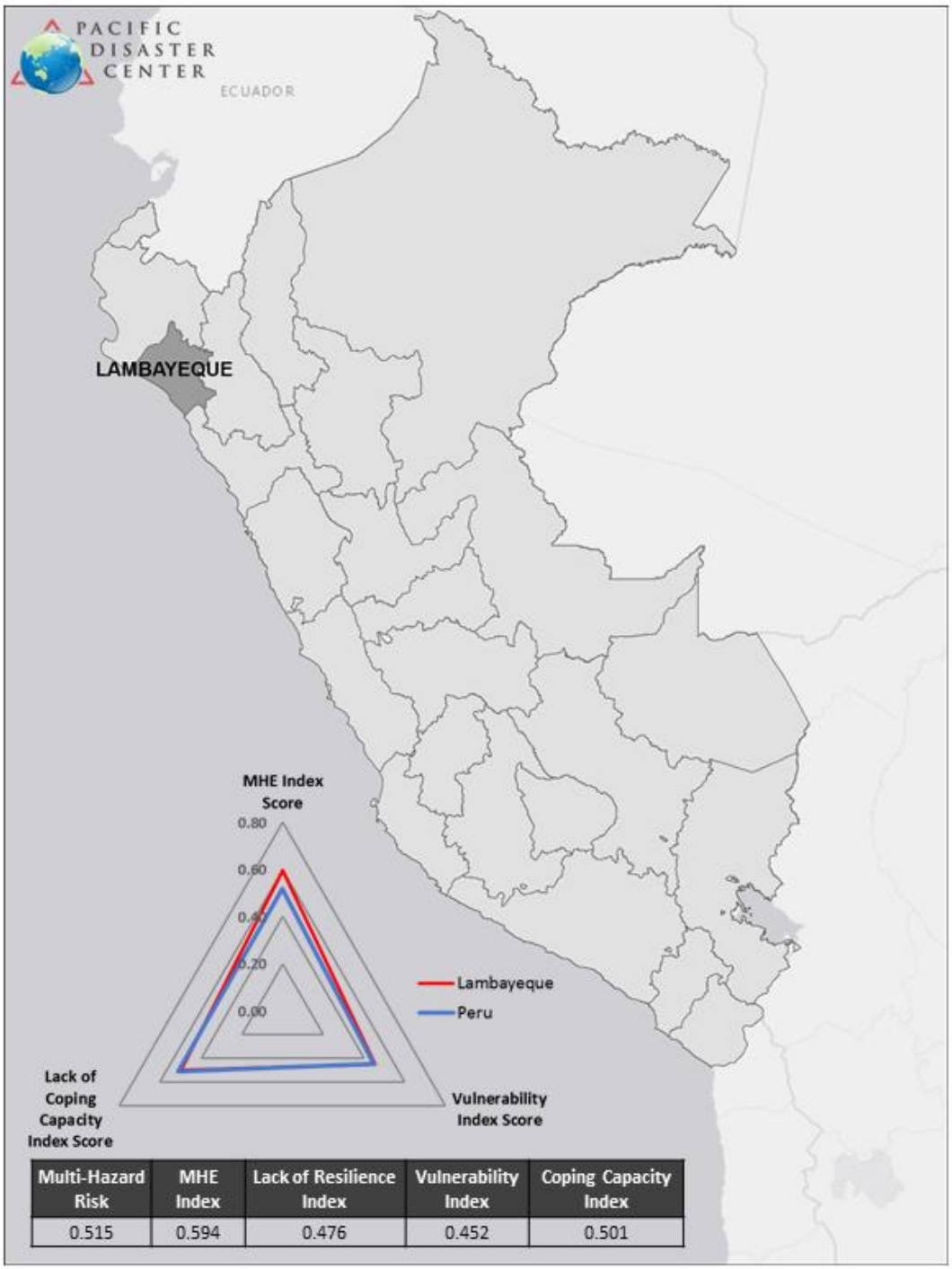
Figure 41. Percent population exposure to hazard type for Cusco

Table 34. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Cusco

Index	Cusco	
	Score	**Rank**
Multi-Hazard Exposure	0. 661	10
Subcomponents		
Raw Exposure	0. 661	7
Relative Exposure	0. 661	14

Lambayeque: Risk

Lambayeque ranks **9 of 25** on the **Multi-Hazard Risk Index** with a score of **0.515**. Lambayeque's score and ranking are due to moderate Multi-Hazard Exposure combined with high Coping Capacity and moderate Vulnerability scores. Lambayeque has the 13th highest MHE in the country, the 11th highest Vulnerability, and the 10th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.515	0.594	0.476	0.452	0.501

Lambayeque: Lack of Resilience

Lambayeque ranks **13 of 25** on the **Lack of Resilience Index** with a score of **0.476**. Lambayeque's score and ranking are due to high Vulnerability combined with low Coping Capacity scores. Lambayeque has the 11th highest Vulnerability and the 10th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Lambayeque are: **Environmental Stress**, **Environmental Capacity**, and **Economic Capacity.**

Table 35. Lack of Resilience Index and Component scores for Lambayeque

Index	Lambayeque	
	Score	**Rank**
Lack of Resilience	0.476	13
Components		
Vulnerability	0.452	11
Coping Capacity	0.501	10

Lambayeque: Coping Capacity

Lambayeque's coping capacity is **10th out of 25** with a score of **0.501**. The thematic areas with the weakest relative scores are **Environmental Capacity** and **Economic Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

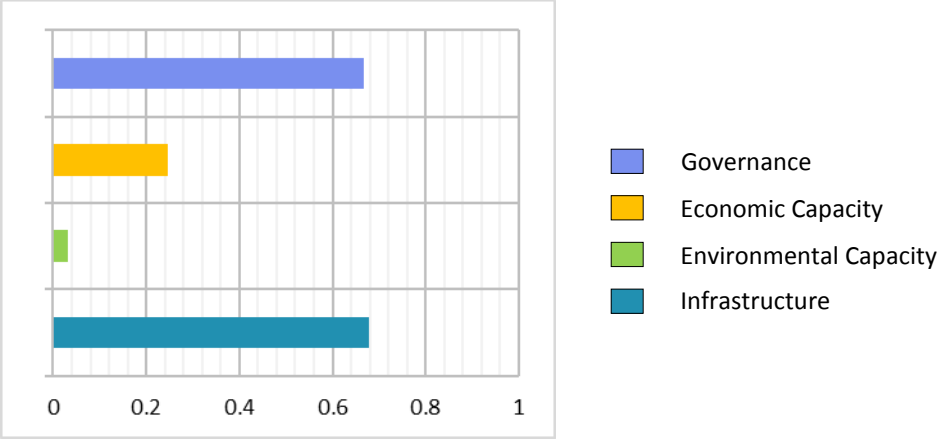


Figure 42. Coping Capacity subcomponents for Lambayeque

Table 36. Coping Capacity Index, subcomponent, and sub-index scores for Lambayeque

Index	Lambayeque	
	Score	Rank
Coping Capacity	0. 501	10
Subcomponents		
Governance	0. 666	9
Economic Capacity	0. 247	17
Environmental Capacity	0. 031	19
Infrastructure	0. 679	4
Infrastructure Sub-indices		
Health Care	0. 506	9
Transportation	0. 754	4
Communications	0. 778	4

Lambayeque: Vulnerability

Lambayeque ranks **11th out of 25** on the Vulnerability Index with a score of **0.452**. Vulnerability in Lambayeque is strongly influenced by **Environmental Stress** and **Economic Constraints** subcomponent scores.

Table 37. Vulnerability Index and subcomponent index scores for Lambayeque

Index	Lambayeque	
	Score	Rank
Vulnerability	0. 452	11
Subcomponents		
Economic Constraints	0. 569	7
Info Access Vulnerability	0. 437	17
Vulnerable Health Status	0. 228	24
Clean Water Vulnerability	0. 233	18
Population Pressures	0. 425	14
Environmental Stress	1. 000	1
Recent Disaster Impacts	0. 214	19
Gender Inequality	0. 511	12

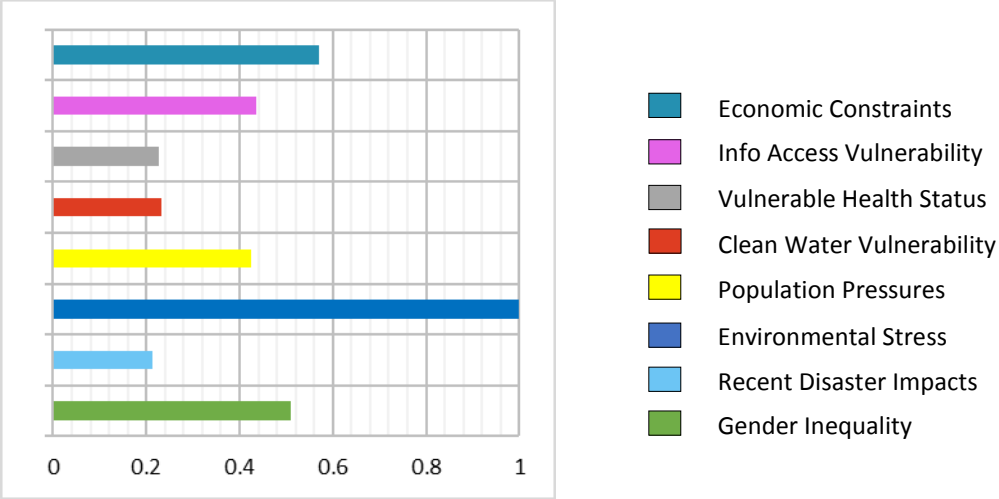


Figure 43. Vulnerability subcomponents for Lambayeque

Lambayeque: Multi-Hazard Exposure

Lambayeque ranks **13th out of 25** on the MHE index with a score of **0.594**. A large proportion of the population is exposed to **seismic activity**, **low temperature, flood,** and **mass movement**. Though Lambayeque is also exposed to tsunami, the hazard affects a relatively small proportion of the population.

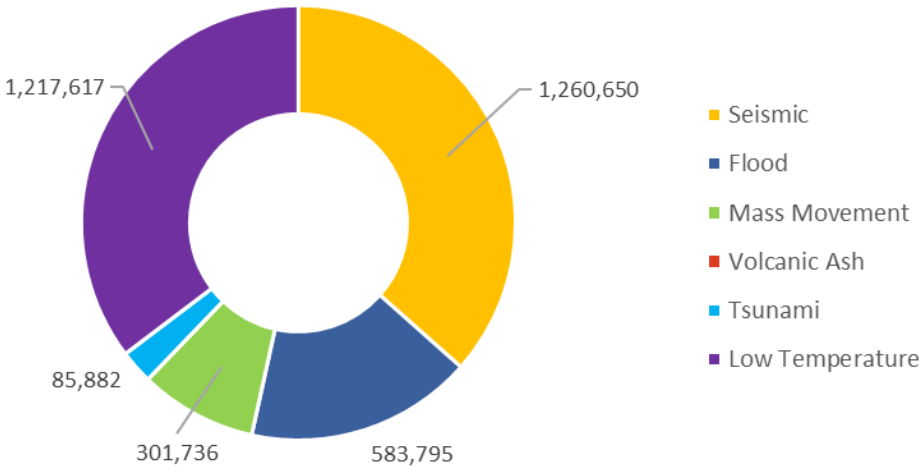


Figure 44. Raw population exposure by hazard type for Lambayeque

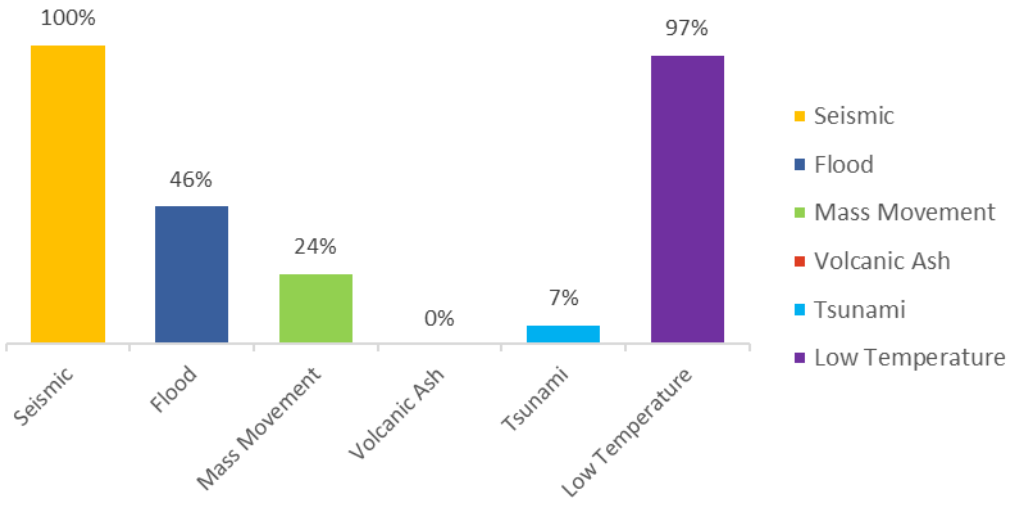


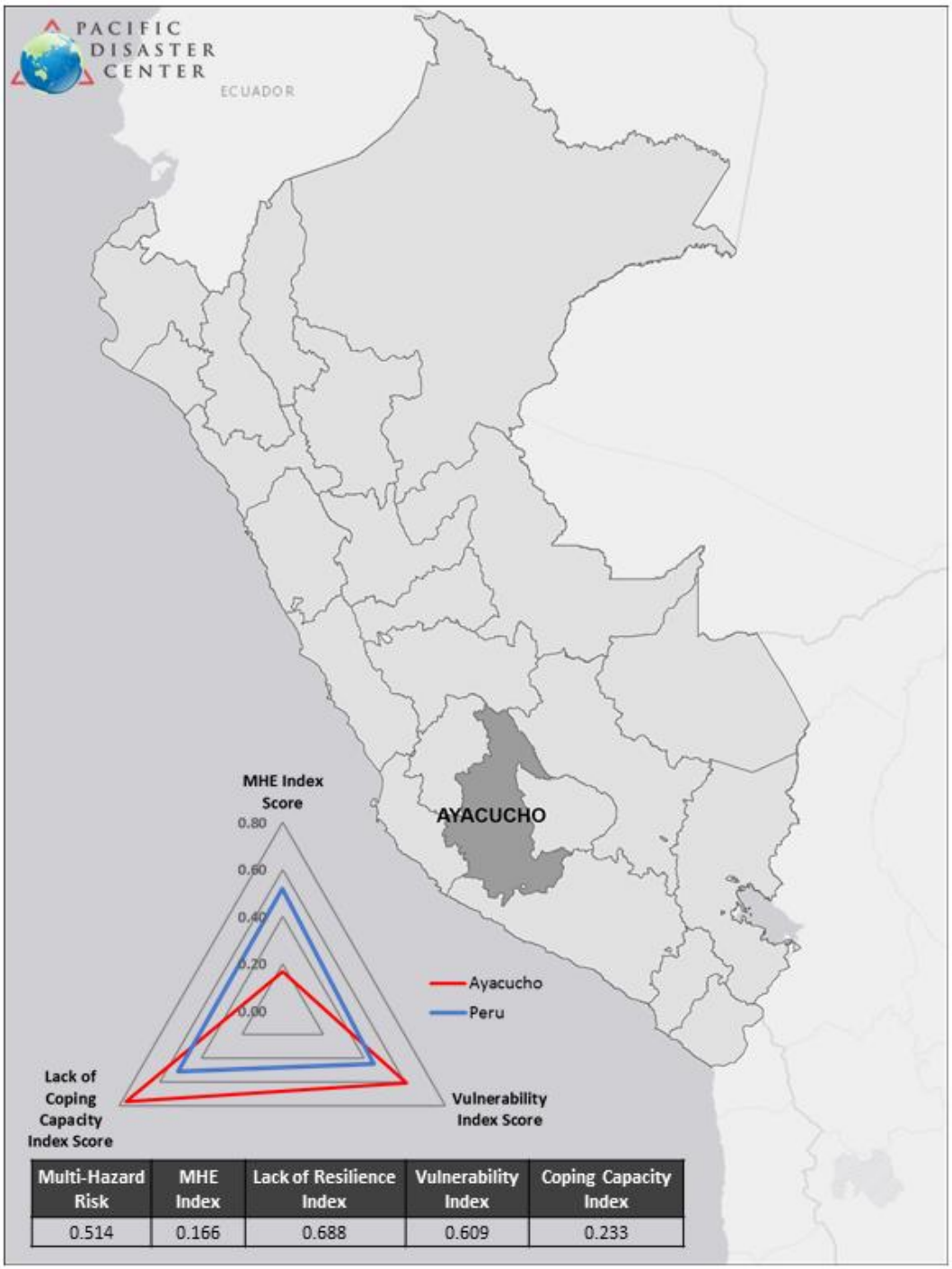
Figure 45. Percent population exposure to hazard type for Lambayeque

Table 38. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Lambayeque

Index	Lambayeque	
	Score	**Rank**
Multi-Hazard Exposure	0. 594	13
Subcomponents		
Raw Exposure	0. 596	9
Relative Exposure	0. 592	16

Ayacucho: Risk

Ayacucho ranks **10 of 25** on the **Multi-Hazard Risk Index** with a score of **0.514**. Ayacucho's score and ranking are driven primarily by the combination of very low Coping Capacity and very high Vulnerability scores. Though Ayacucho has only the 24th highest MHE in the country, it ranks the 2nd highest in Vulnerability and 25th highest in Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.514	0.166	0.688	0.609	0.233

Ayacucho: Lack of Resilience

Ayacucho ranks **2 of 25** on the **Lack of Resilience Index** with a score of **0.688**. Ayacucho's score and ranking are due to very high Vulnerability combined with very low Coping Capacity scores. Ayacucho has the 2nd highest Vulnerability and the 25th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Ayacucho are: **Governance**, **Economic Constraints**, and **Information Access Vulnerability.**

Table 39. Lack of Resilience Index and Component scores for Ayacucho

Index	Ayacucho	
	Score	**Rank**
Lack of Resilience	0.688	2
Components		
Vulnerability	0.609	2
Coping Capacity	0.233	25

Ayacucho: Coping Capacity

Ayacucho's coping capacity is lowest in the country, ranked **25th out of 25** with a score of **0.233**. Ayacucho ranks very low in all dimensions of coping capacity, with the weakest relative scores in **Governance, Environmental Capacity,** and **Economic Capacity**. Weakness across these thematic areas appear to constrain Coping Capacity within this region.

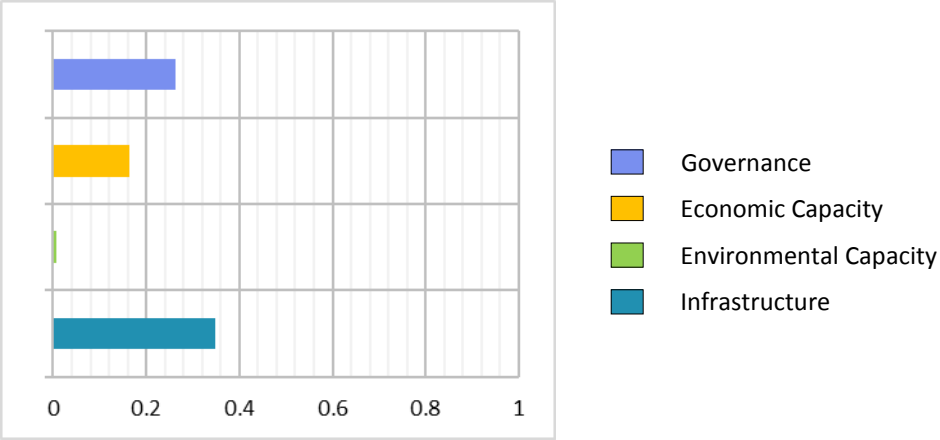


Figure 46. Coping Capacity subcomponents for Ayacucho

Table 40. Coping Capacity Index, subcomponent and sub-index scores for Ayacucho

Index	Ayacucho	
	Score	**Rank**
Coping Capacity	0. 233	25
Subcomponents		
Governance	0. 262	24
Economic Capacity	0. 163	21
Environmental Capacity	0. 006	21
Infrastructure	0. 347	19
Infrastructure Sub-indices		
Health Care	0. 352	15
Transportation	0. 392	20
Communications	0. 296	22

Ayacucho: Vulnerability

Ayacucho ranks **2nd out of 25** on the Vulnerability Index with a score of **0.609**. Vulnerability in Ayacucho is strongly influenced by **Economic Constraints, Information Access Vulnerability, Vulnerable Health Status,** and **Recent Disaster Impacts** subcomponent scores.

Table 41. Vulnerability Index and subcomponent index scores for Ayacucho

Index	Ayacucho	
	Score	**Rank**
Vulnerability	0. 609	2
Subcomponents		
Economic Constraints	0. 724	2
Info Access Vulnerability	0. 738	4
Vulnerable Health Status	0. 564	4
Clean Water Vulnerability	0. 445	12
Population Pressures	0. 676	8
Environmental Stress	0. 456	10
Recent Disaster Impacts	0. 676	5
Gender Inequality	0. 595	7

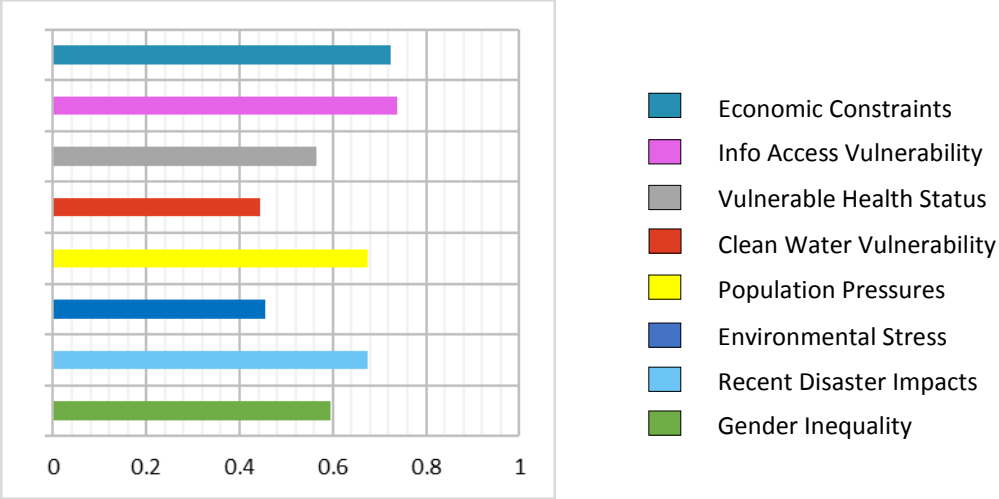


Figure 47. Vulnerability subcomponents for Ayacucho

Ayacucho: Multi-Hazard Exposure

Ayacucho ranks **24th out of 25** on the MHE index with a score of **0.166**. Despite the low rank, a significant proportion of Ayacucho's population is exposed to **mass movement, flood, seismic activity,** and **low temperature**.

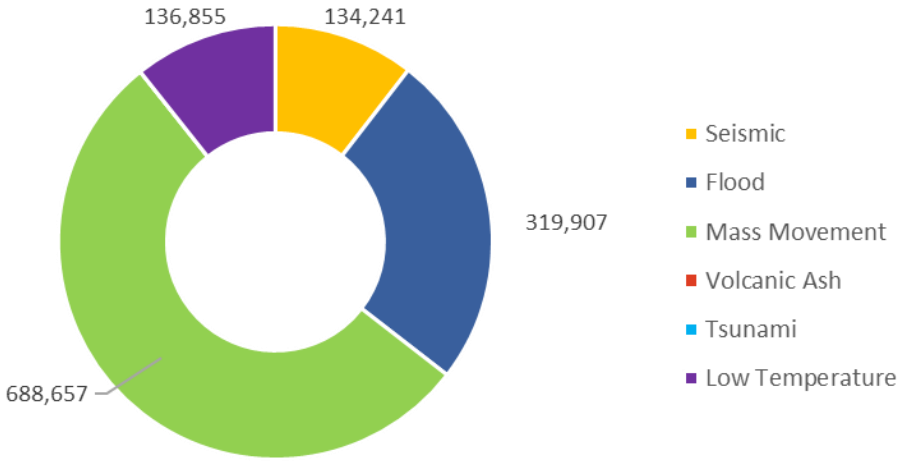


Figure 48. Raw population exposure by hazard type for Ayacucho

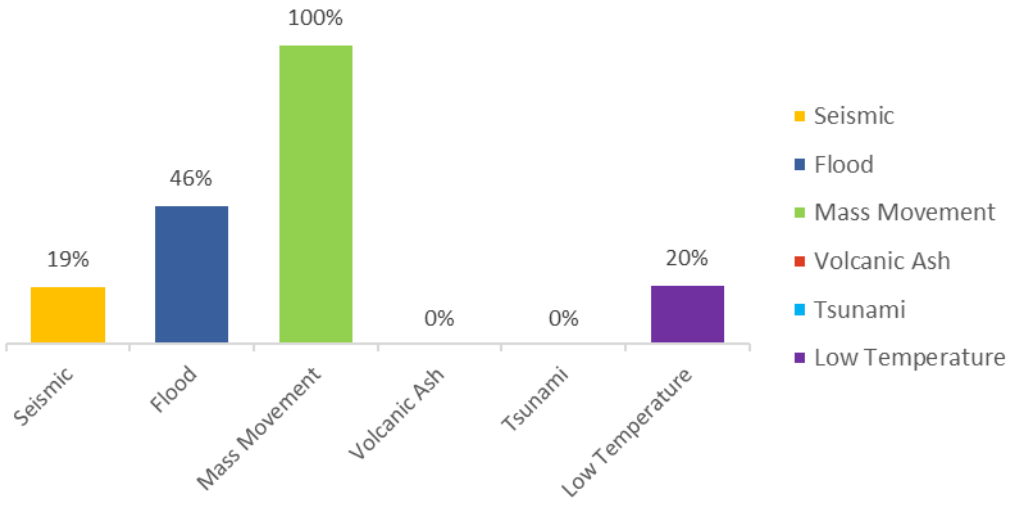


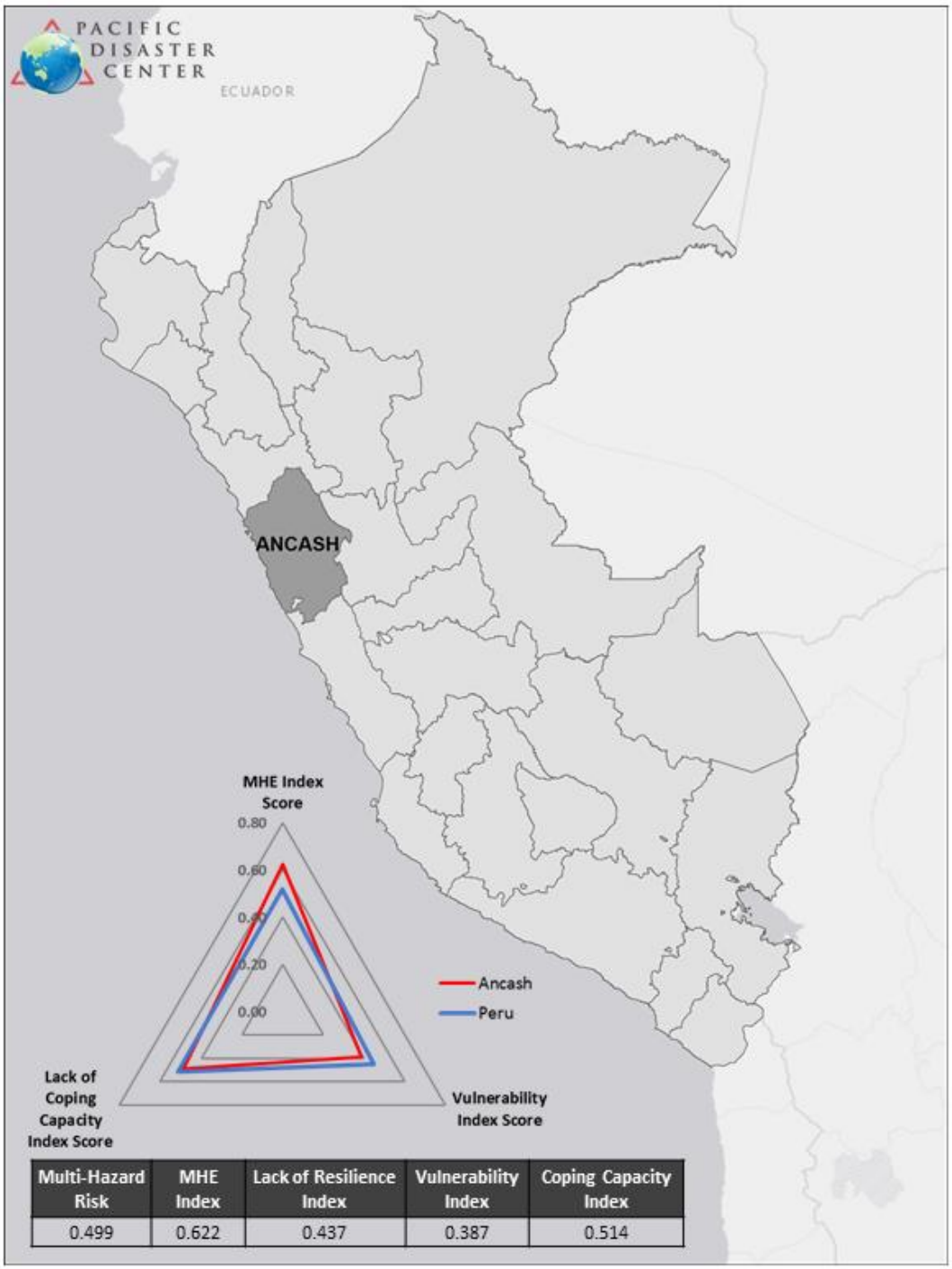
Figure 49. Percent population exposure to hazard type for Ayacucho

Table 42. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Ayacucho

Index	Ayacucho	
	Score	**Rank**
Multi-Hazard Exposure	0. 166	24
Subcomponents		
Raw Exposure	0. 177	17
Relative Exposure	0. 155	23

Ancash: Risk

Ancash ranks **11 of 25** on the **Multi-Hazard Risk Index** with a score of **0.499**. Ancash's score and ranking are due to moderate Multi-Hazard Exposure combined with high Coping Capacity and low Vulnerability scores. Ancash has the 11th highest MHE in the country, the 17th highest Vulnerability, and the 9th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.499	0.622	0.437	0.387	0.514

Ancash: Lack of Resilience

Ancash ranks **19 of 25** on the **Lack of Resilience Index** with a score of **0.437**. Ancash's score and ranking are due to low Vulnerability combined with high Coping Capacity scores. Ancash ranks 17th in Vulnerability and the 9th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Ancash are: **Environmental Stress**, **Environmental Capacity**, and **Governance.**

Table 43. Lack of Resilience Index and Component scores for Ancash

Index	Ancash	
	Score	**Rank**
Lack of Resilience	0.437	19
Components		
Vulnerability	0.387	17
Coping Capacity	0.514	9

Ancash: Coping Capacity

Ancash's coping capacity is **9th out of 25** with a score of **0.514**. Despite this relatively high rank, the region exhibits some thematic weaknesses in **Environmental Capacity, Governance,** and **Health Care Capacity**, which may constrain Coping Capacity within this region.

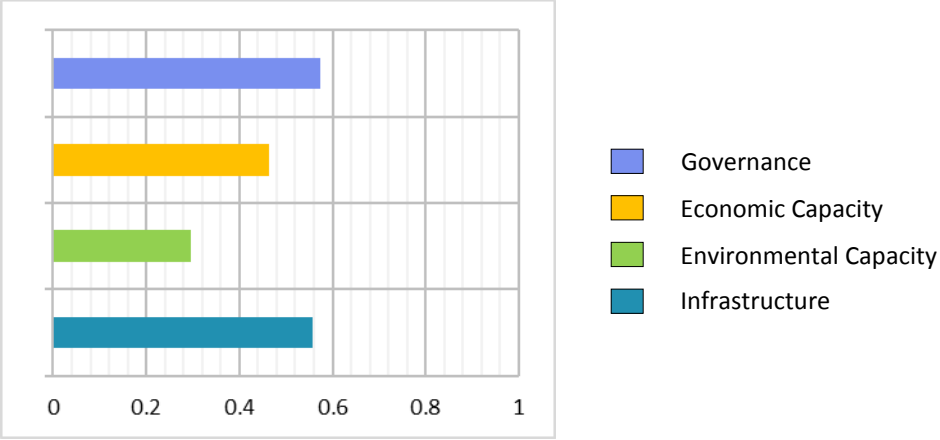


Figure 50. Coping Capacity subcomponents for Ancash

Table 44. Coping Capacity Index, subcomponent and sub-index scores for Ancash

Index	Ancash	
	Score	**Rank**
Coping Capacity	0. 514	9
Subcomponents		
Governance	0. 575	13
Economic Capacity	0. 463	9
Environmental Capacity	0. 296	12
Infrastructure	0. 556	10
Infrastructure Sub-indices		
Health Care	0. 371	14
Transportation	0. 629	7
Communications	0. 667	8

Ancash: Vulnerability

Ancash ranks **17th out of 25** on the Vulnerability Index with a score of **0.387**. While the region's overall Vulnerability is relatively low, the index is influenced by the high **Environmental Stress** subcomponent score.

Table 45. Vulnerability Index and subcomponent index scores for Ancash

Index	Ancash	
	Score	**Rank**
Vulnerability	0. 387	17
Subcomponents		
Economic Constraints	0. 481	13
Info Access Vulnerability	0. 521	12
Vulnerable Health Status	0. 396	17
Clean Water Vulnerability	0. 203	19
Population Pressures	0. 186	20
Environmental Stress	0. 702	4
Recent Disaster Impacts	0. 169	22
Gender Inequality	0. 441	16

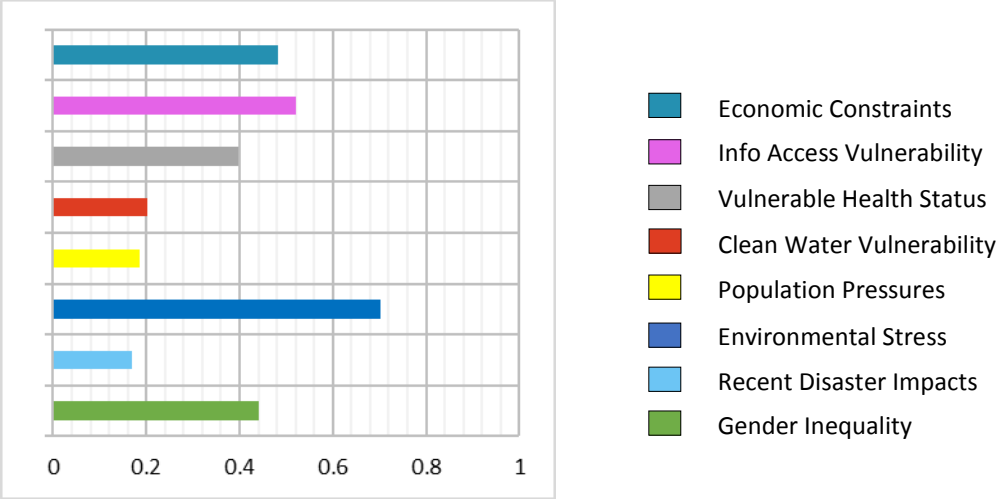


Figure 51. Vulnerability subcomponents for Ancash

Ancash: Multi-Hazard Exposure

Ancash ranks **11th out of 25** on the MHE index with a score of **0.622**. A significant proportion of the population is exposed to **mass movement, seismic activity**, **flood**, **tsunami,** and **low temperature.**

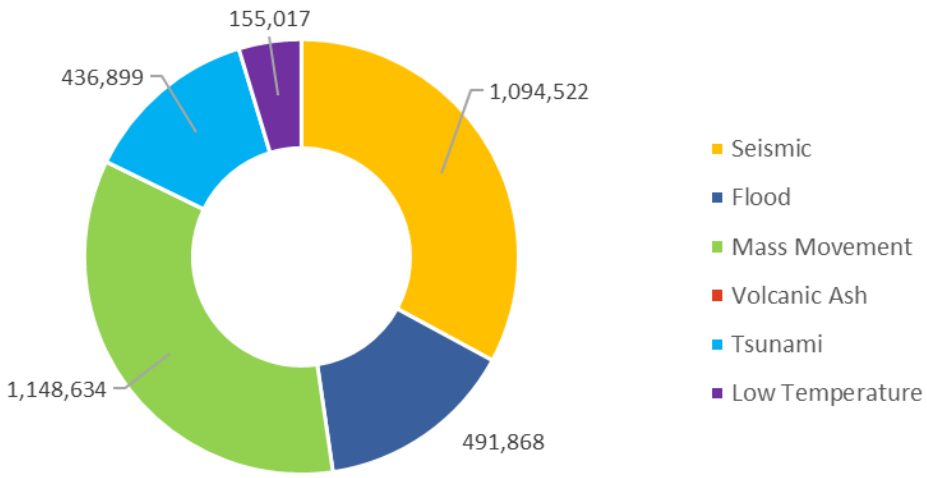


Figure 52. Raw population exposure by hazard type for Ancash

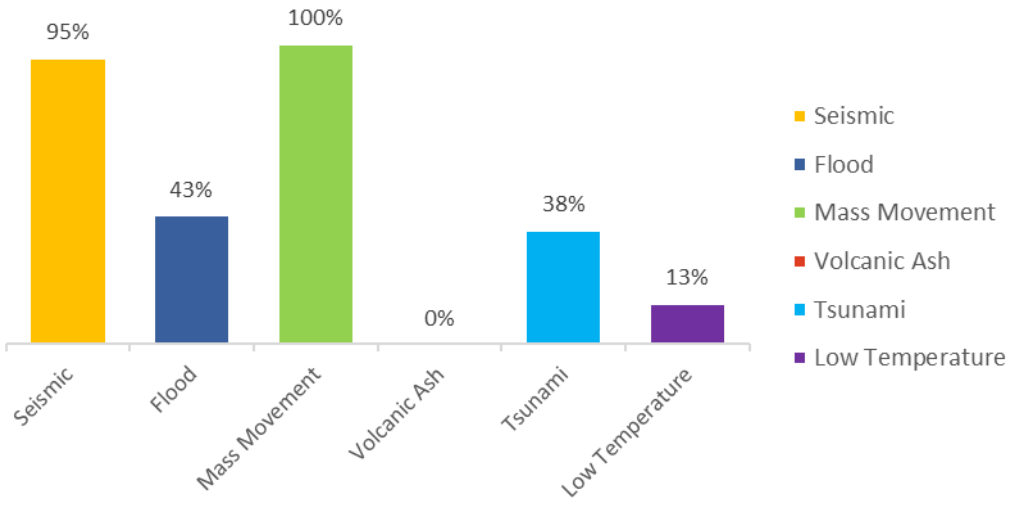


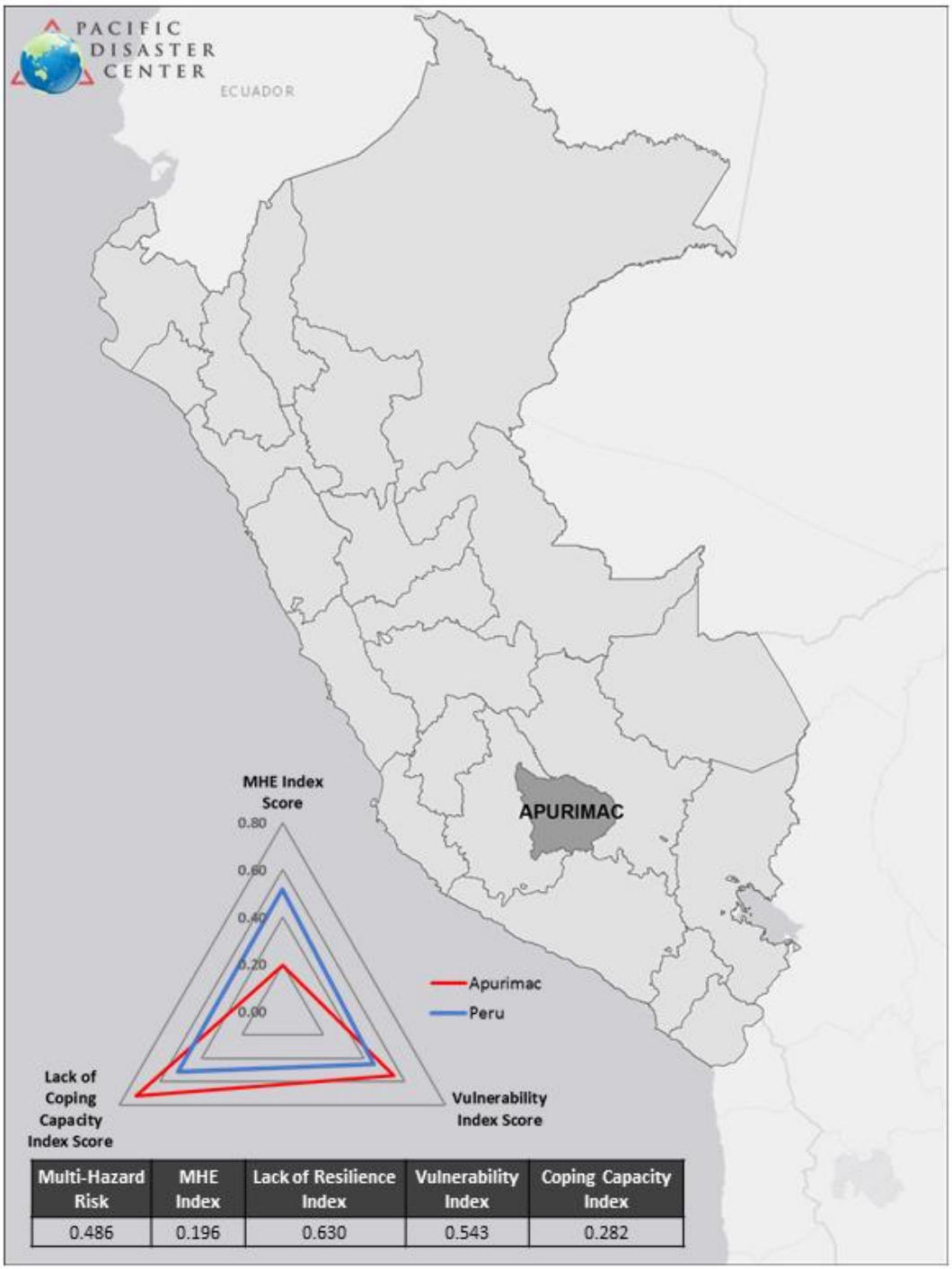
Figure 53. Percent population exposure to hazard type for Ancash

Table 46. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Ancash

Index	Ancash	
	Score	**Rank**
Multi-Hazard Exposure	0. 622	11
Subcomponents		
Raw Exposure	0. 573	10
Relative Exposure	0. 672	13

Apurimac: Risk

Apurimac ranks **12 of 25** on the **Multi-Hazard Risk Index** with a score of **0.486**. Apurimac's score and ranking are driven primarily by the combination of very low Coping Capacity with high Vulnerability scores. Though Apurimac ranks 22nd in the country for MHE, it has 6th highest Vulnerability and ranks 24th in Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.486	0.196	0.630	0.543	0.282

Apurimac: Lack of Resilience

Apurimac ranks **3 of 25** on the **Lack of Resilience Index** with a score of **0.630**. Apurimac's score and ranking are due to high Vulnerability combined with very low Coping Capacity scores. Apurimac has the 6th highest Vulnerability and the 24th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Apurimac are: **Economic Capacity**, **Environmental Capacity**, and **Recent Disaster Impacts.**

Table 47. Lack of Resilience Index and Component scores for Apurimac

Index	Apurimac	
	Score	**Rank**
Lack of Resilience	0.630	3
Components		
Vulnerability	0.543	6
Coping Capacity	0.282	24

Apurimac: Coping Capacity

Apurimac's coping capacity is **24th out of 25** with a score of **0.282**. Apurimac ranks very low in all dimensions of coping capacity, with the weakest relative scores in **Environmental Capacity, Economic Capacity,** and **Governance**. Weakness across these thematic areas appear to constrain Coping Capacity within this region.

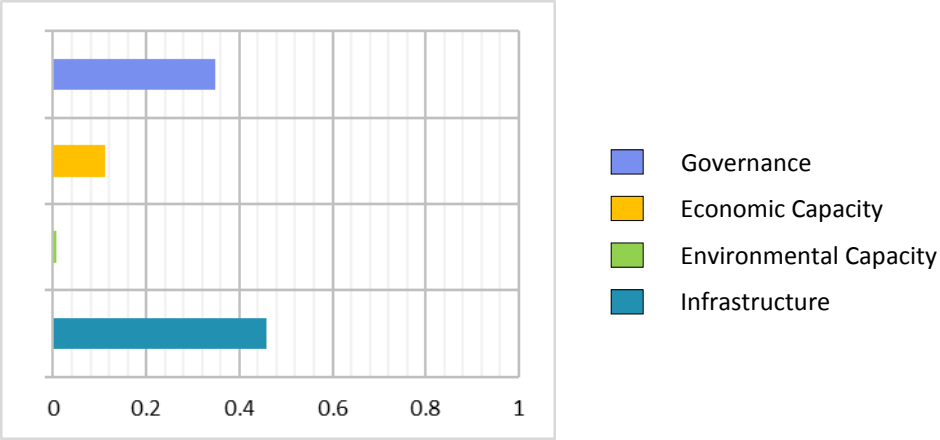


Figure 54. Coping Capacity subcomponents for Apurimac

Table 48. Coping Capacity Index, subcomponent and sub-index scores for Apurimac

Index	Apurimac	
	Score	**Rank**
Coping Capacity	0. 282	24
Subcomponents		
Governance	0. 348	21
Economic Capacity	0. 113	24
Environmental Capacity	0. 006	22
Infrastructure	0. 459	13
Infrastructure Sub-indices		
Health Care	0. 521	7
Transportation	0. 557	9
Communications	0. 298	21

Apurimac: Vulnerability

Apurimac ranks **6th out of 25** on the Vulnerability Index with a score of **0.543**. Vulnerability in Apurimac is influenced by **Recent Disaster Impacts**, **Information Access Vulnerability, Environmental Stress,** and **Economic Constraints** subcomponent scores.

Table 49. Vulnerability Index and subcomponent index scores for Apurimac

Index	Apurimac	
	Score	**Rank**
Vulnerability	0. 543	6
Subcomponents		
Economic Constraints	0. 607	5
Info Access Vulnerability	0. 657	5
Vulnerable Health Status	0. 534	9
Clean Water Vulnerability	0. 433	13
Population Pressures	0. 162	21
Environmental Stress	0. 658	7
Recent Disaster Impacts	0. 727	3
Gender Inequality	0. 567	9

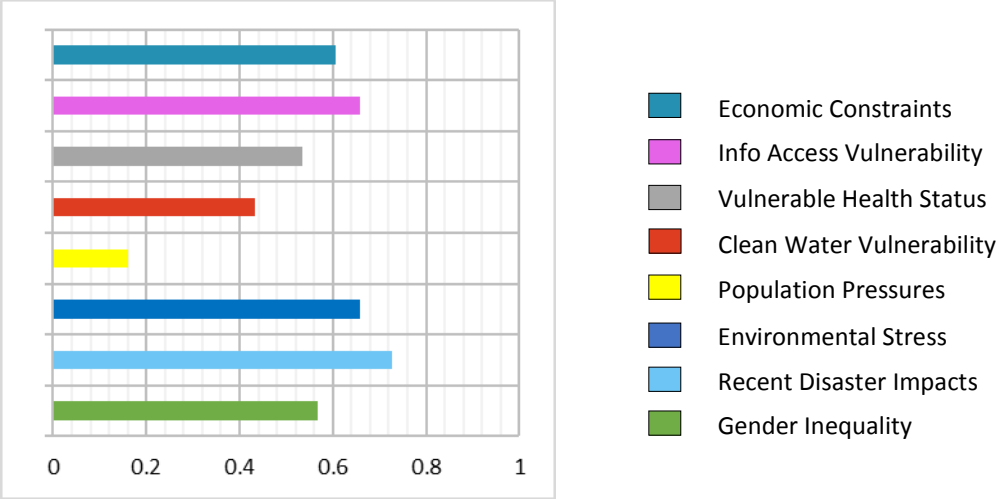


Figure 55. Vulnerability subcomponents for Apurimac

Apurimac: Multi-Hazard Exposure

Apurimac ranks **22nd out of 25** on the MHE index with a score of **0.196**. Despite this low score, a significant proportion of Apurimac's population is exposed to **mass movement, seismic activity**, and **flood**. Though Apurimac is also exposed to low temperature, the hazard affects a relatively small proportion of the population.

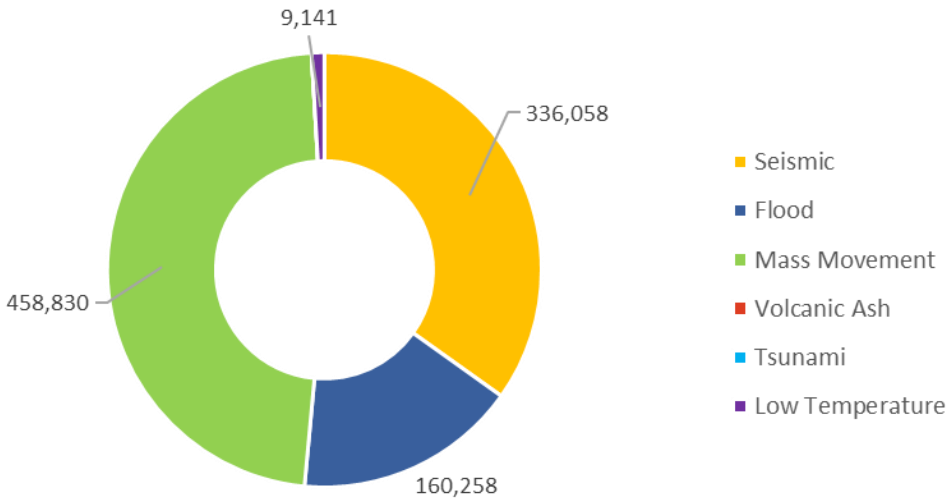


Figure 56. Raw population exposure by hazard type for Apurimac

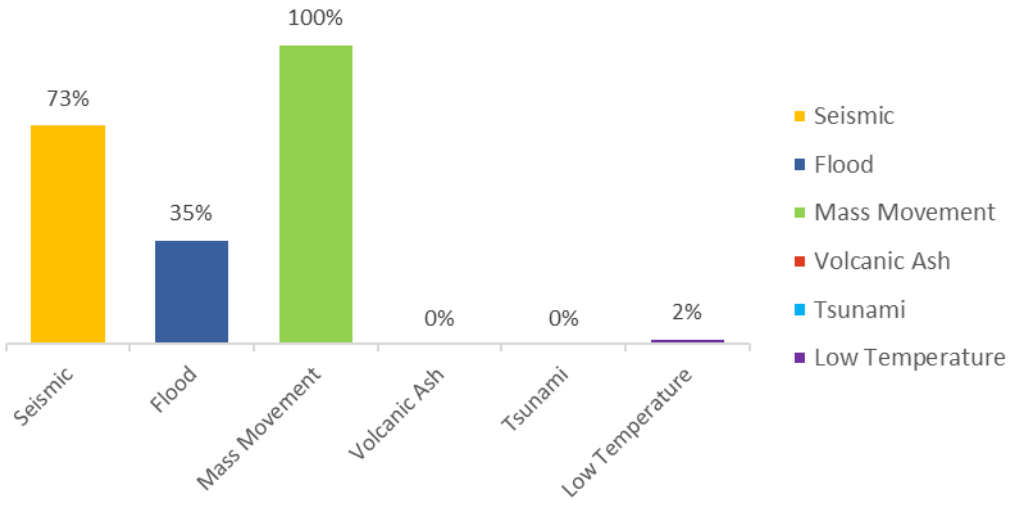


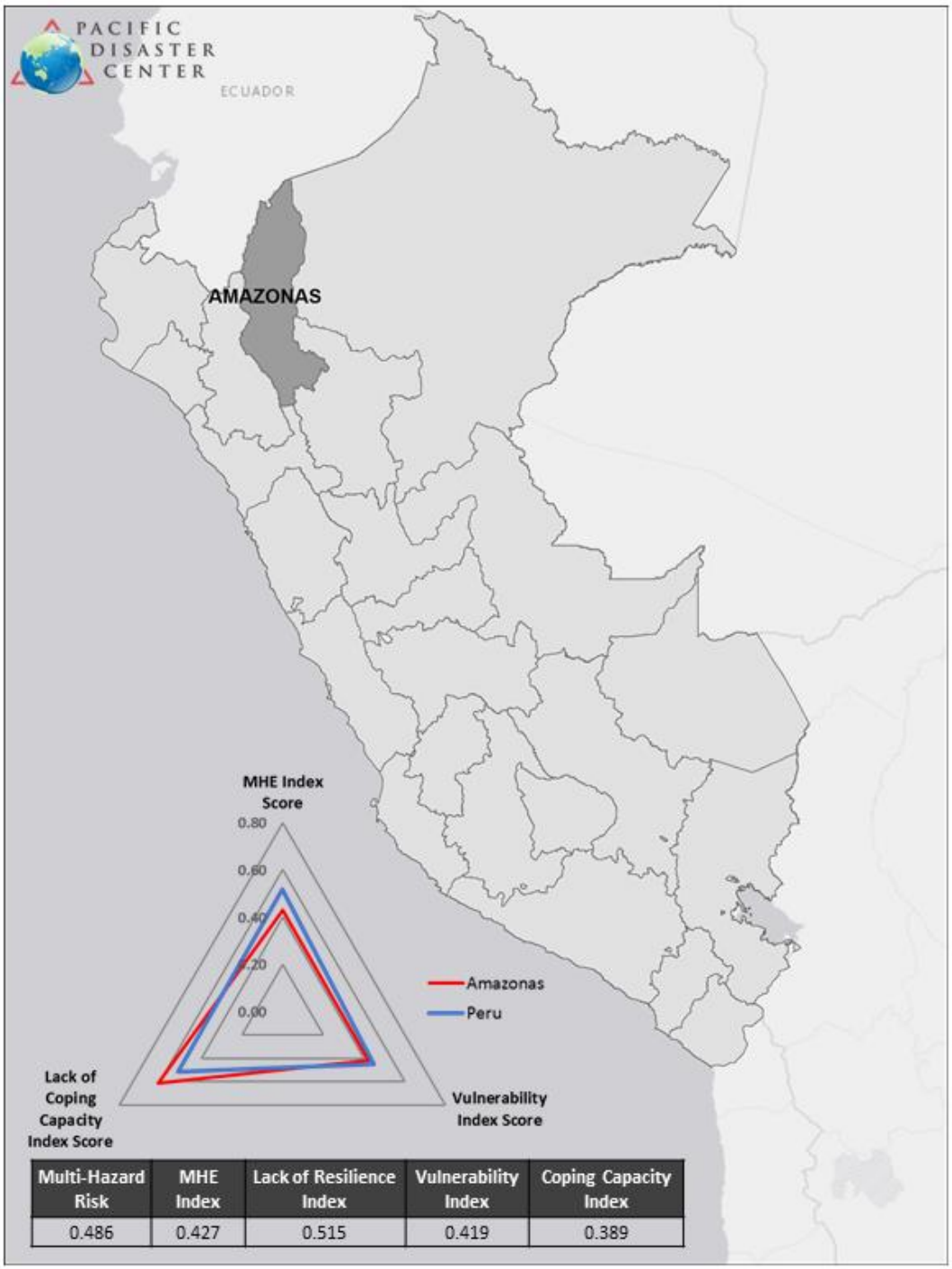
Figure 57. Percent population exposure to hazard type for Apurimac

Table 50. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Apurimac

Index	Apurimac	
	Score	**Rank**
Multi-Hazard Exposure	0. 196	22
Subcomponents		
Raw Exposure	0. 117	21
Relative Exposure	0. 276	22

Amazonas: Risk

Amazonas ranks **13 of 25** on the **Multi-Hazard Risk Index** with a score of **0.486**. Amazonas's score and ranking are due to moderate Multi-Hazard Exposure combined with very low Coping Capacity and moderate Vulnerability scores. Amazonas has the 15th highest MHE in the country, the 15th highest Vulnerability, and the 21st highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.486	0.427	0.515	0.419	0.389

Amazonas: Lack of Resilience

Amazonas ranks **9 of 25** on the **Lack of Resilience Index** with a score of **0.515**. Amazonas's score and ranking are due to moderate Vulnerability combined with very low Coping Capacity scores. Amazonas has the 15th highest Vulnerability and the 21st highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Amazonas are: **Economic Capacity**, **Infrastructure**, and **Vulnerable Health Status.**

Table 51. Lack of Resilience Index and Component scores for Amazonas

Index	Amazonas	
	Score	**Rank**
Lack of Resilience	0.515	9
Components		
Vulnerability	0.419	15
Coping Capacity	0.389	21

Amazonas: Coping Capacity

Amazonas's coping capacity is **21st out of 25** with a score of **0.389**. The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure**. These thematic areas appear to constrain Coping Capacity within this region.

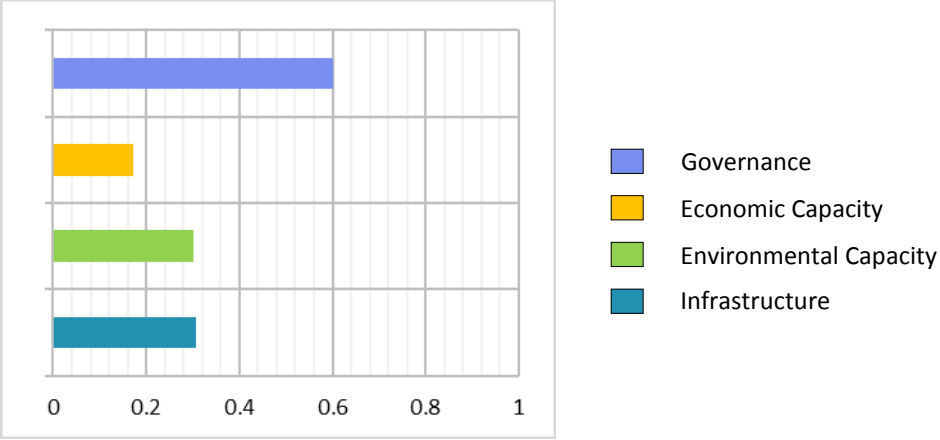


Figure 58. Coping Capacity subcomponents for Amazonas

Table 52. Coping Capacity Index, subcomponent and sub-index scores for Amazonas

Index	Amazonas	
	Score	Rank
Coping Capacity	0. 389	21
Subcomponents		
Governance	0. 600	12
Economic Capacity	0. 171	20
Environmental Capacity	0. 301	11
Infrastructure	0. 308	22
Infrastructure Sub-indices		
Health Care	0. 343	17
Transportation	0. 352	21
Communications	0. 228	24

Amazonas: Vulnerability

Amazonas ranks **15th out of 25** on the Vulnerability Index with a score of **0.419**. Vulnerability in Amazonas is influenced by **Vulnerable Health Status**, **Information Access Vulnerability,** and **Clean Water Vulnerability** subcomponent scores.

Table 53. Vulnerability Index and subcomponent index scores for Amazonas

Index	Amazonas	
	Score	Rank
Vulnerability	0. 419	15
Subcomponents		
Economic Constraints	0. 513	10
Info Access Vulnerability	0. 614	8
Vulnerable Health Status	0. 565	3
Clean Water Vulnerability	0. 588	9
Population Pressures	0. 078	22
Environmental Stress	0. 223	18
Recent Disaster Impacts	0. 260	17
Gender Inequality	0. 515	11

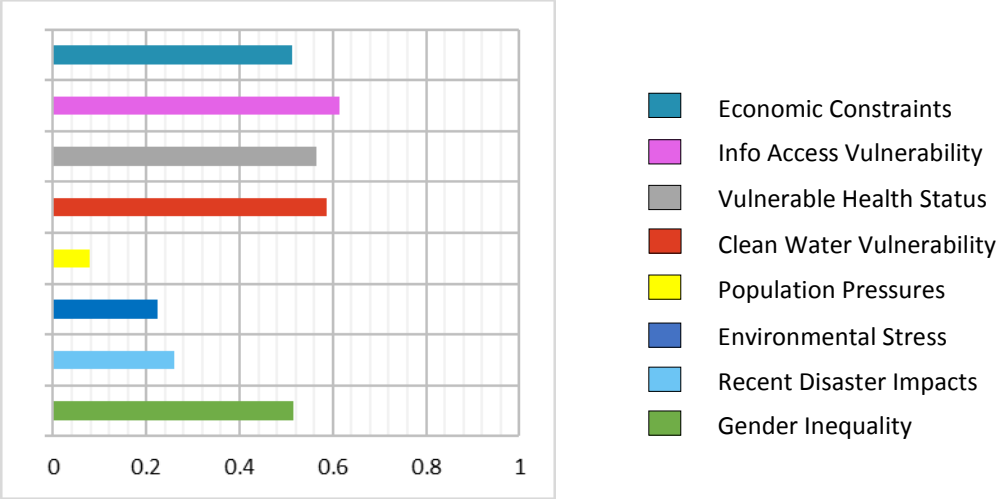


Figure 59. Vulnerability subcomponents for Amazonas

Amazonas: Multi-Hazard Exposure

Amazonas ranks **15th out of 25** on the MHE index with a score of **0.427**. A large proportion of the population is exposed to **seismic activity**, **mass movement, flood,** and **low temperature**.

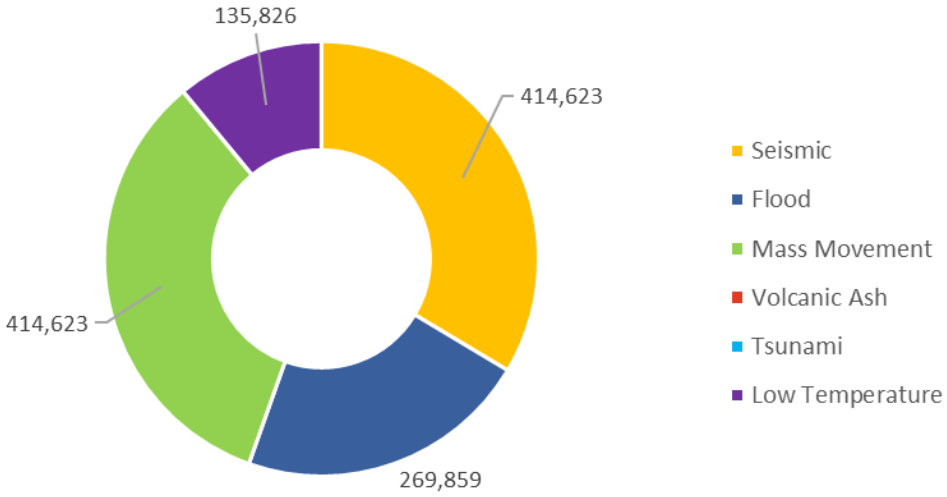


Figure 60. Raw population exposure by hazard type for Amazonas

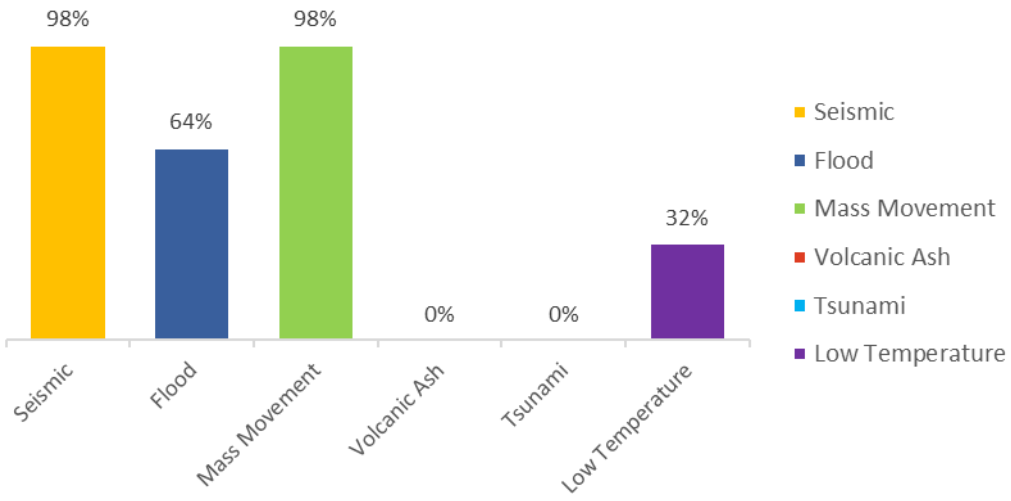


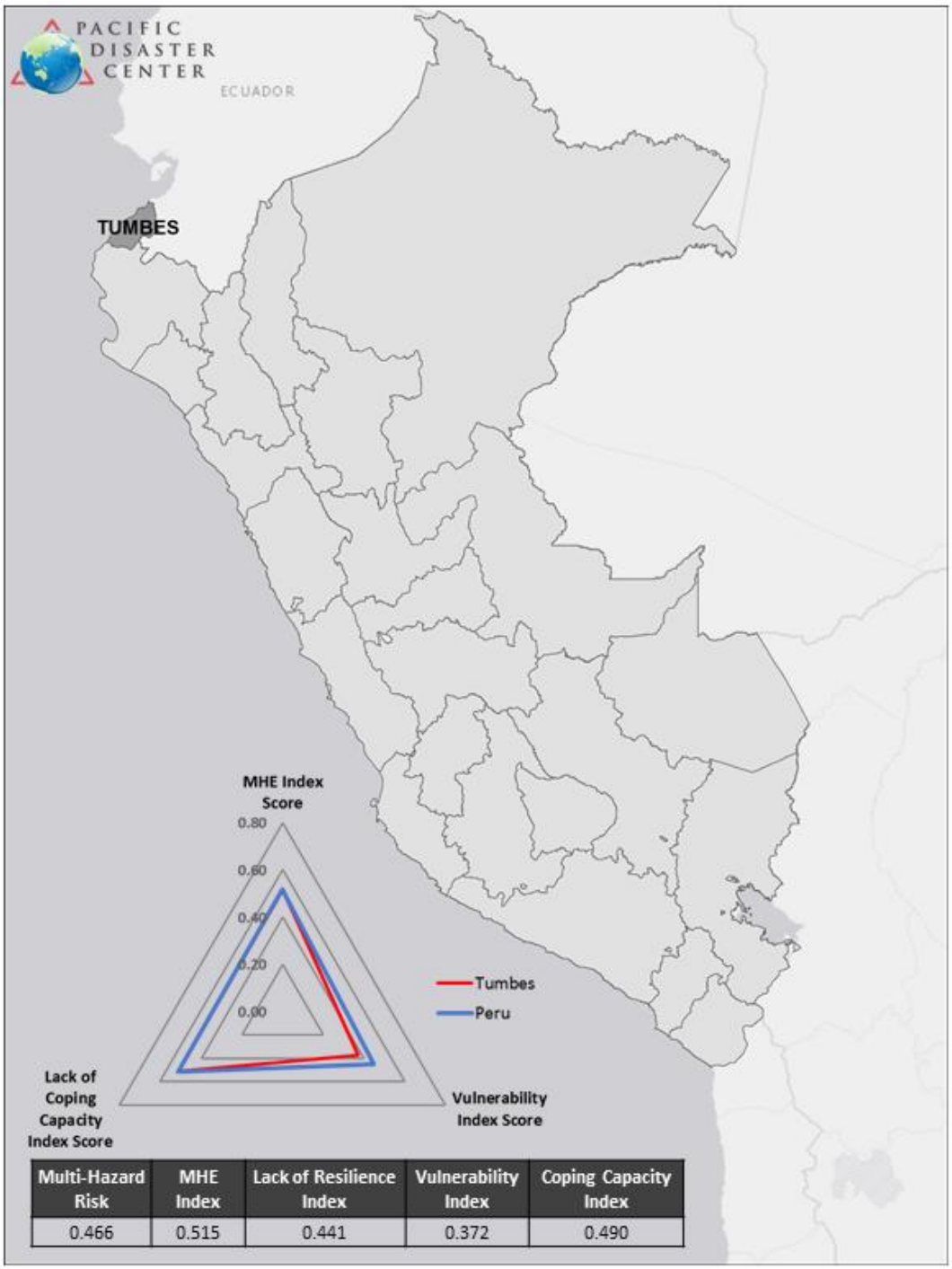
Figure 61. Percent population exposure to hazard type for Amazonas

Table 54. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Amazonas

Index	Amazonas	
	Score	**Rank**
Multi-Hazard Exposure	0. 427	15
Subcomponents		
Raw Exposure	0. 169	18
Relative Exposure	0. 685	11

Tumbes: Risk

Tumbes ranks **14 of 25** on the **Multi-Hazard Risk Index** with a score of **0.466**. Tumbes's score and ranking are due to moderate Multi-Hazard Exposure combined with moderate Coping Capacity and low Vulnerability scores. Tumbes has the 14th highest MHE in the country, the 19th highest Vulnerability, and the 12th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.466	0.515	0.441	0.372	0.490

Tumbes: Lack of Resilience

Tumbes ranks **18 of 25** on the **Lack of Resilience Index** with a score of **0.441**. Tumbes's score and ranking are due to low Vulnerability combined with moderate Coping Capacity scores. Tumbes has the 19th highest Vulnerability and the 12th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Tumbes are: **Population Pressures**, **Governance,** and **Health Care Capacity.**

Table 55. Lack of Resilience Index and Component scores for Tumbes

Index	Tumbes	
	Score	**Rank**
Lack of Resilience	0.441	18
Components		
Vulnerability	0.372	19
Coping Capacity	0.490	12

Tumbes: Coping Capacity

Tumbes's coping capacity is **12th out of 25** with a score of **0.490**. The thematic areas with the weakest relative scores are **Governance** and **Economic Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

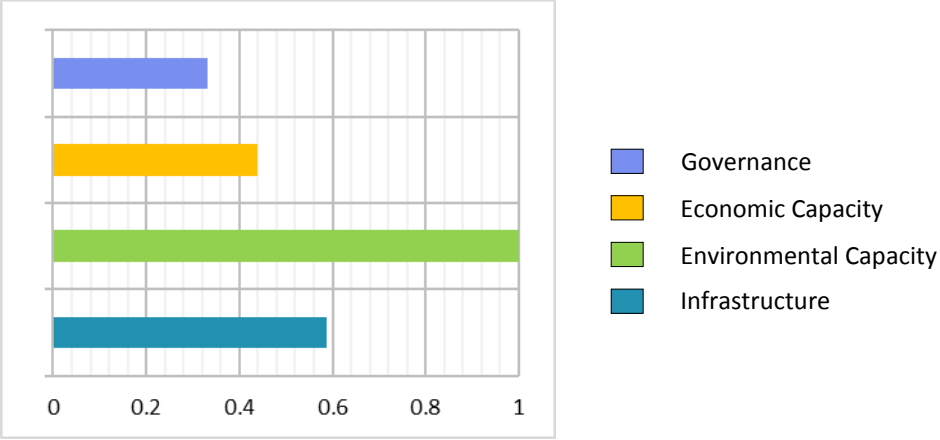


Figure 62. Coping Capacity subcomponents for Tumbes

Table 56. Coping Capacity Index, subcomponent and sub-index scores for Tumbes

Index	Tumbes	
	Score	Rank
Coping Capacity	0. 490	12
Subcomponents		
Governance	0. 332	22
Economic Capacity	0. 440	11
Environmental Capacity	1. 000	2
Infrastructure	0. 588	9
Infrastructure Sub-indices		
Health Care	0. 348	16
Transportation	0. 755	3
Communications	0. 660	9

Tumbes: Vulnerability

Tumbes ranks **19th out of 25** on the Vulnerability Index with a score of **0.372**. Though Vulnerability in Tumbes is relative low, the Index is influenced by a very high **Population Pressures** subcomponent score.

Table 57. Vulnerability Index and subcomponent index scores for Tumbes

Index	Tumbes	
	Score	Rank
Vulnerability	0. 372	19
Subcomponents		
Economic Constraints	0. 267	19
Info Access Vulnerability	0. 294	19
Vulnerable Health Status	0. 405	16
Clean Water Vulnerability	0. 409	14
Population Pressures	0. 904	3
Environmental Stress	0. 240	17
Recent Disaster Impacts	0. 178	21
Gender Inequality	0. 279	23

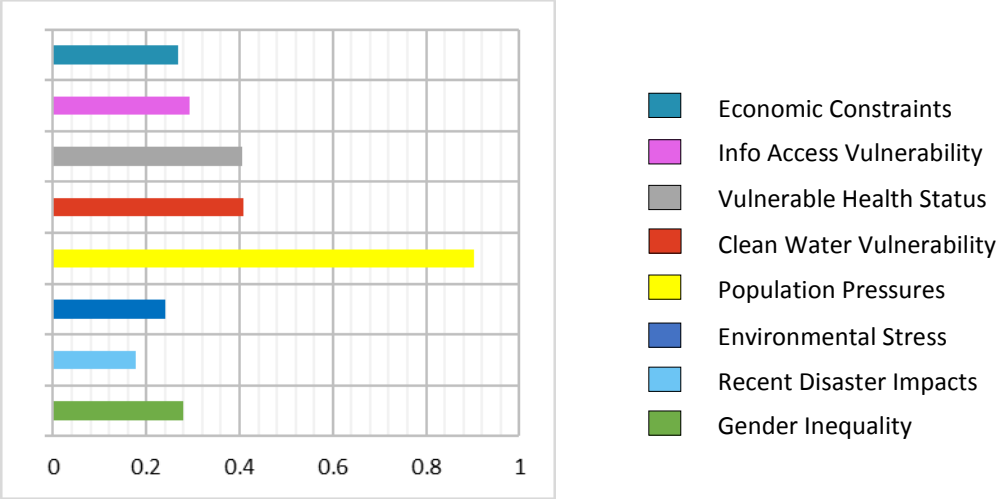


Figure 63. Vulnerability subcomponents for Tumbes

Tumbes: Multi-Hazard Exposure

Tumbes ranks **14th out of 25** on the MHE index with a score of **0.515**. A very large proportion of the population is exposed to **seismic activity**, **mass movement, flood,** and **tsunami**.

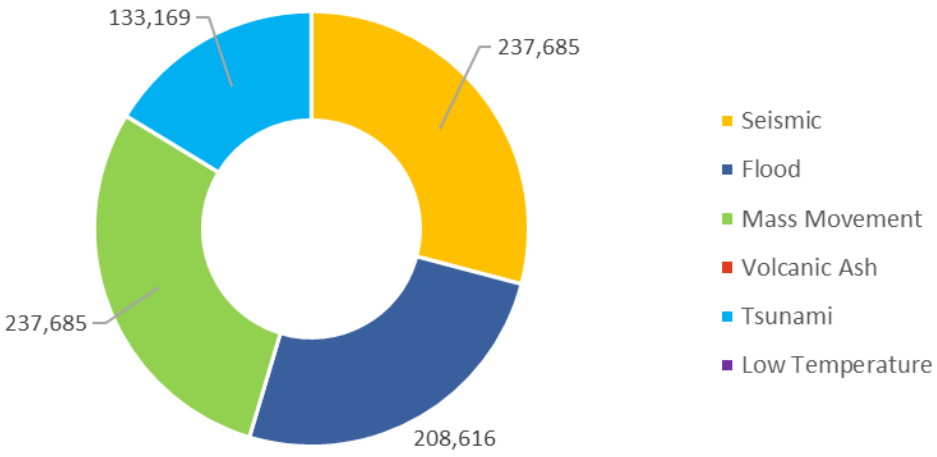


Figure 64. Raw population exposure by hazard type for Tumbes

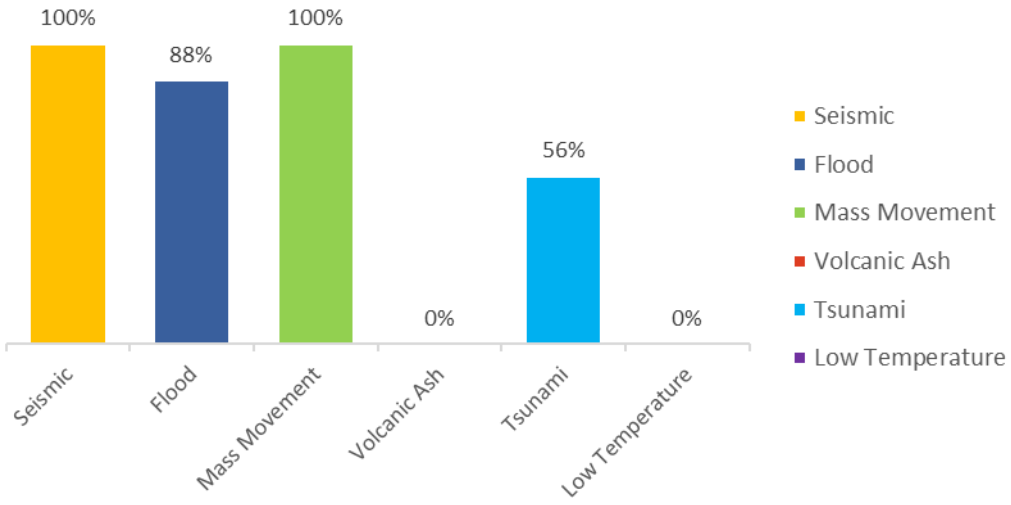


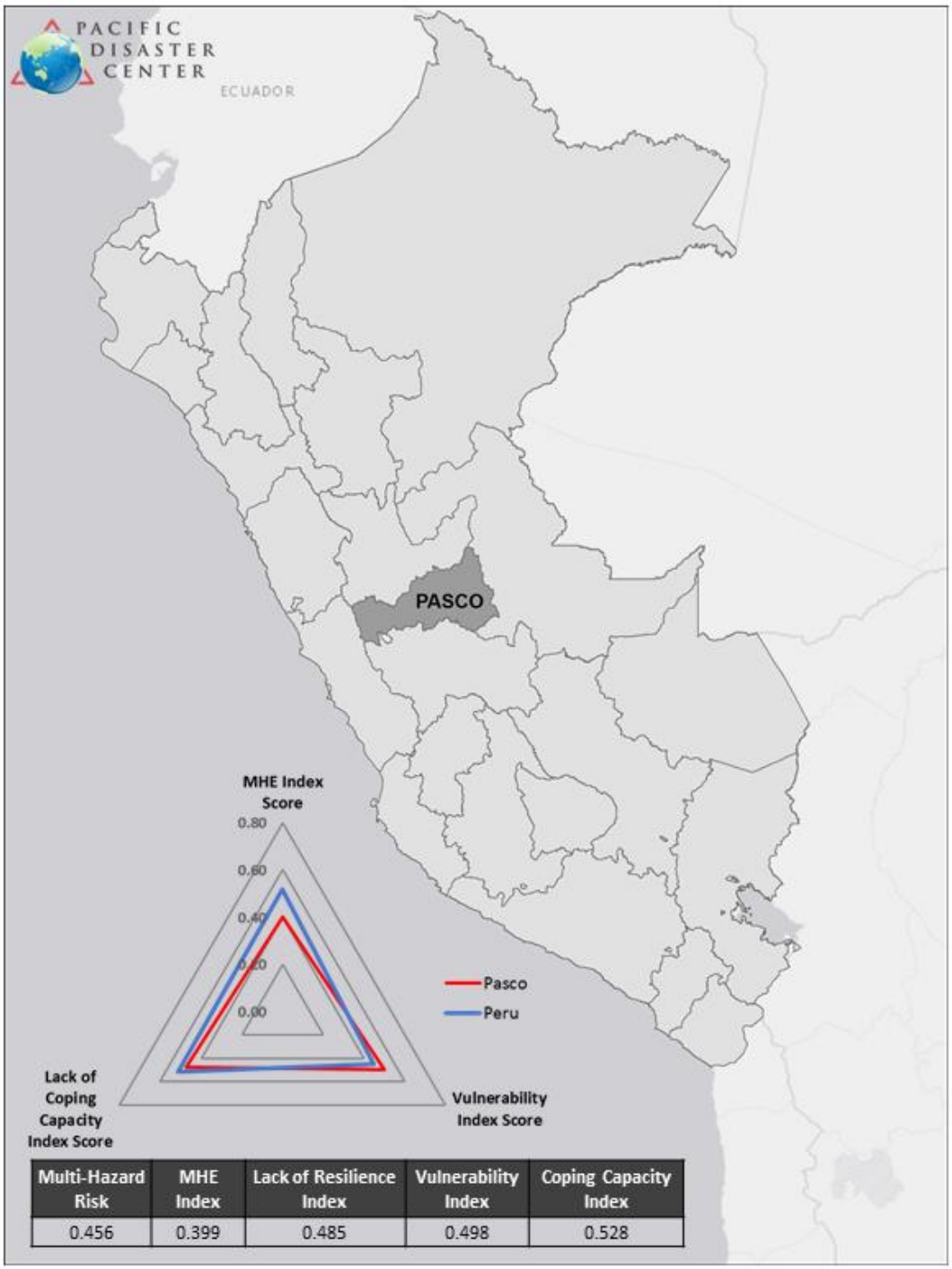
Figure 65. Percent population exposure to hazard type for Tumbes

Table 58. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Tumbes

Index	Tumbes	
	Score	**Rank**
Multi-Hazard Exposure	0. 515	14
Subcomponents		
Raw Exposure	0. 088	23
Relative Exposure	0. 942	2

Pasco: Risk

Pasco ranks **15 of 25** on the **Multi-Hazard Risk Index** with a score of **0.456**. Pasco's score and ranking are due to low Multi-Hazard Exposure combined with high Coping Capacity and high Vulnerability scores. Pasco has the 19th highest MHE in the country, the 8th highest Vulnerability, and the 8th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.456	0.399	0.485	0.498	0.528

Pasco: Lack of Resilience

Pasco ranks **11 of 25** on the **Lack of Resilience Index** with a score of **0.485**. Pasco's score and ranking are due to high Vulnerability combined with high Coping Capacity scores. Pasco has the 8th highest Vulnerability and the 8th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Pasco are: **Clean Water Vulnerability**, **Vulnerable Health Status**, and **Communications Infrastructure.**

Table 59. Lack of Resilience Index and Component scores for Pasco

Index	Pasco	
	Score	**Rank**
Lack of Resilience	0.485	11
Components		
Vulnerability	0.498	8
Coping Capacity	0.528	8

Pasco: Coping Capacity

Pasco's coping capacity is **8th out of 25** with a score of **0.528**. The thematic areas with the weakest relative scores are **Economic Capacity** and **Communications Infrastructure**. These thematic areas appear to constrain Coping Capacity within this region.

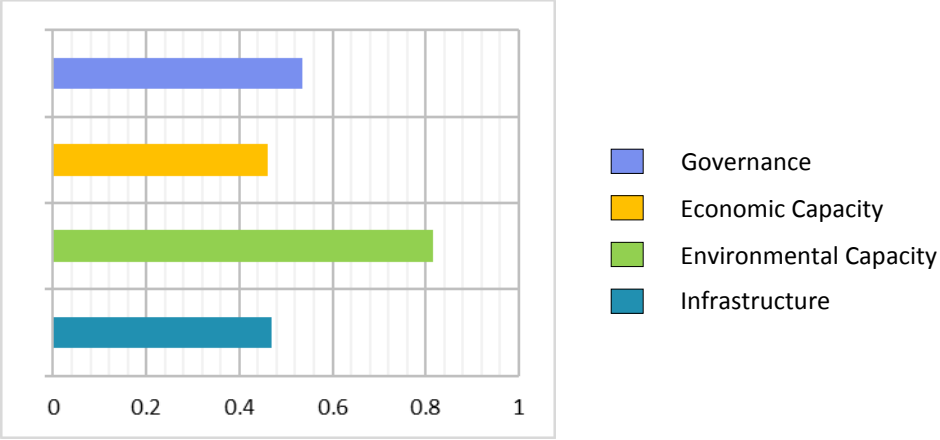


Figure 66. Coping Capacity subcomponents for Pasco

Table 60. Coping Capacity Index, subcomponent and sub-index scores for Pasco

Index	Pasco	
	Score	Rank
Coping Capacity	0. 528	8
Subcomponents		
Governance	0. 534	17
Economic Capacity	0. 460	10
Environmental Capacity	0. 816	3
Infrastructure	0. 470	12
Infrastructure Sub-indices		
Health Care	0. 506	8
Transportation	0. 533	12
Communications	0. 371	18

Pasco: Vulnerability

Pasco ranks **8th out of 25** on the Vulnerability Index with a score of **0.498**. Vulnerability in Pasco is influenced by **Clean Water Vulnerability, Vulnerable Health Status, Information Access Vulnerability,** and **Gender Inequality** subcomponent scores.

Table 61. Vulnerability Index and subcomponent index scores for Pasco

Index	Pasco	
	Score	Rank
Vulnerability	0. 498	8
Subcomponents		
Economic Constraints	0. 543	9
Info Access Vulnerability	0. 573	10
Vulnerable Health Status	0. 554	6
Clean Water Vulnerability	0. 705	5
Population Pressures	0. 343	18
Environmental Stress	0. 161	19
Recent Disaster Impacts	0. 531	9
Gender Inequality	0. 574	8

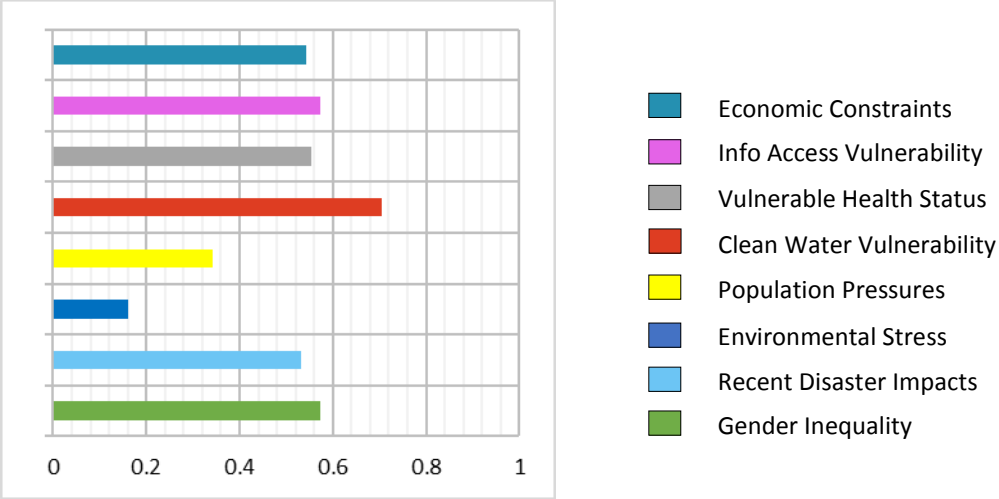


Figure 67. Vulnerability subcomponents for Pasco

Pasco: Multi-Hazard Exposure

Pasco ranks **19th out of 25** on the MHE index with a score of **0.399**. A large proportion of the population is exposed to **mass movement, flood, low temperature,** and **seismic activity.**

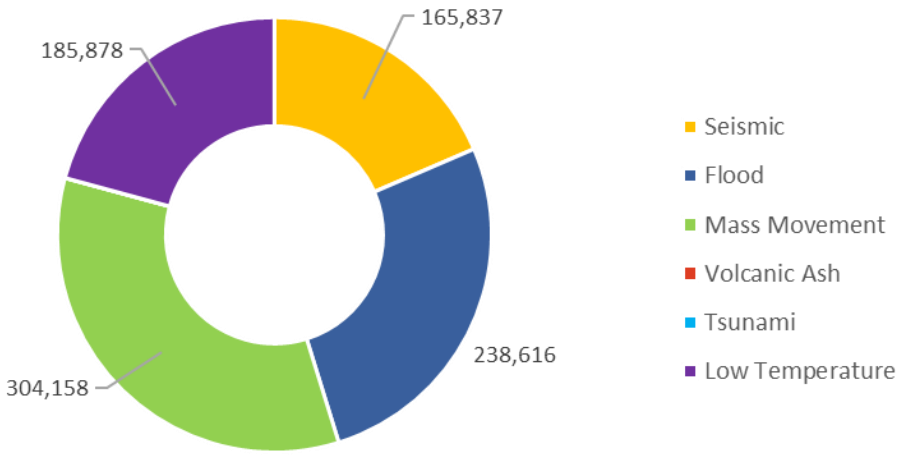


Figure 68. Raw population exposure by hazard type for Pasco

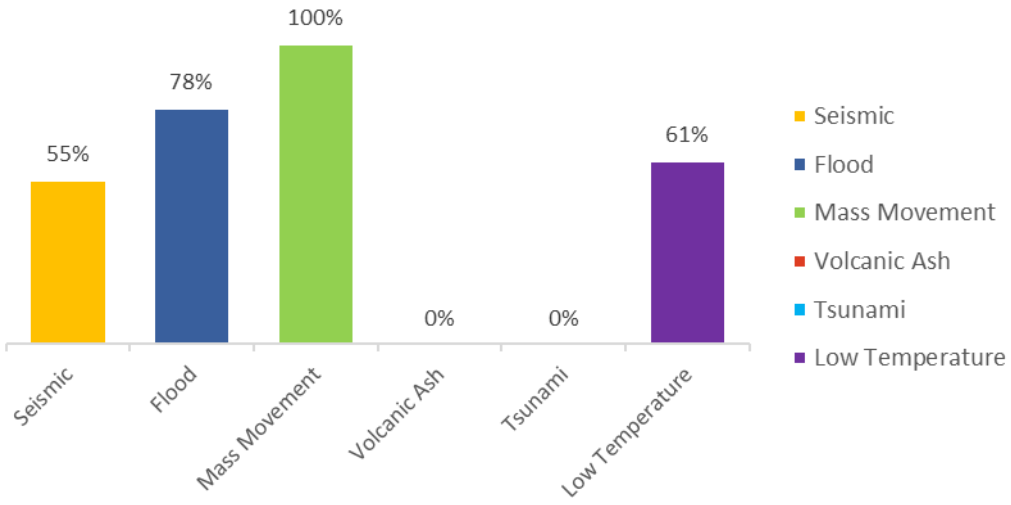


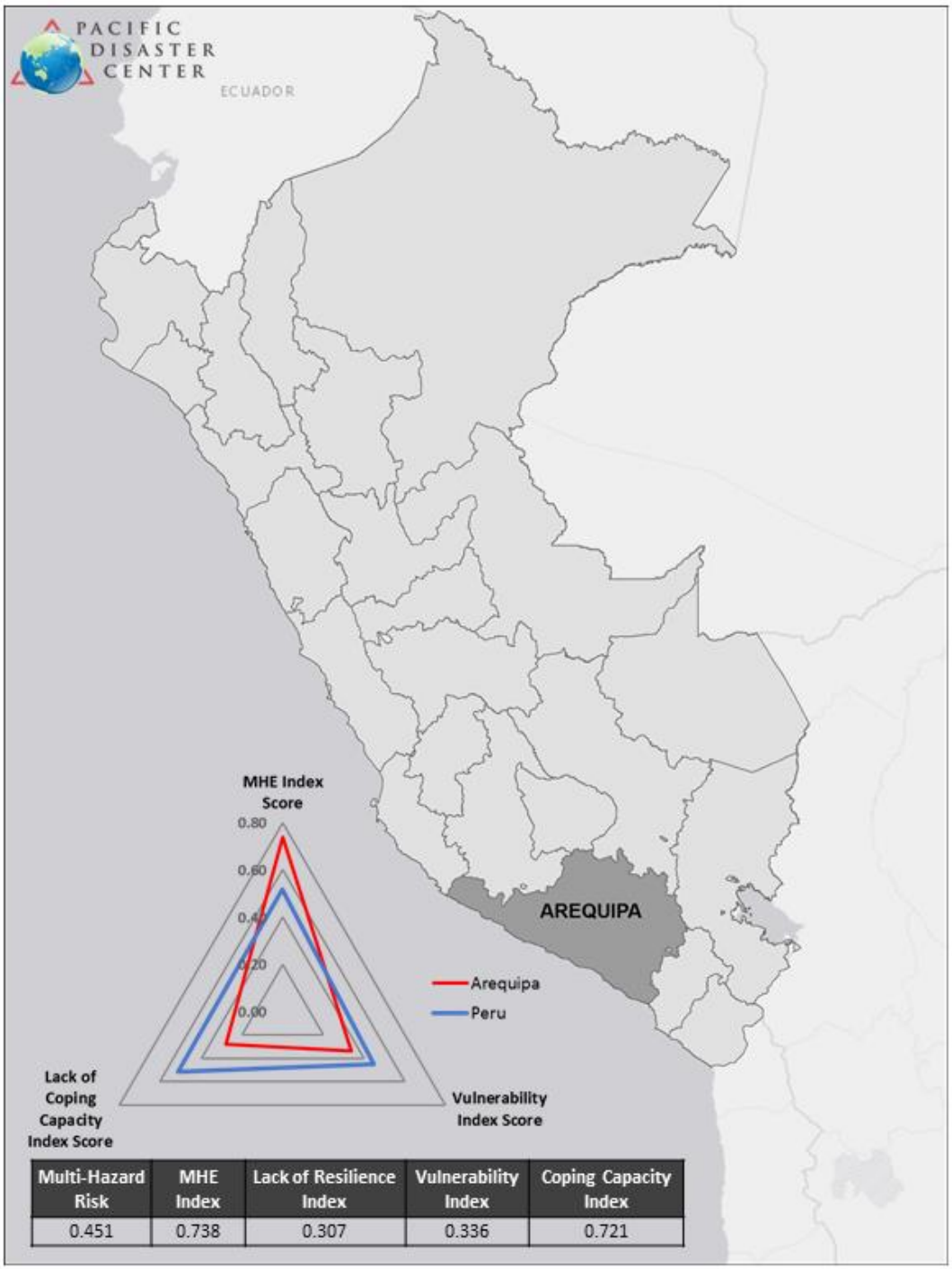
Figure 69. Percent population exposure to hazard type for Pasco

Table 62. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Pasco

Index	Pasco	
	Score	**Rank**
Multi-Hazard Exposure	0. 399	19
Subcomponents		
Raw Exposure	0. 103	22
Relative Exposure	0. 694	10

Arequipa: Risk

Arequipa ranks **16 of 25** on the **Multi-Hazard Risk Index** with a score of **0.451**. Arequipa's score and ranking are due to very high Multi-Hazard Exposure combined with very high Coping Capacity and very low Vulnerability scores. Arequipa has the 5th highest MHE in the country, the 24th highest Vulnerability, and the 2nd highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.451	0.738	0.307	0.336	0.721

Arequipa: Lack of Resilience

Arequipa ranks **23 of 25** on the **Lack of Resilience Index** with a score of **0.307**. Arequipa's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Arequipa has the 24th highest Vulnerability and the 2nd highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Arequipa are: **Population Pressures**, **Environmental Capacity**, and **Transportation Infrastructure.**

Table 63. Lack of Resilience Index and Component scores for Arequipa

Index	Arequipa	
	Score	**Rank**
Lack of Resilience	0.307	23
Components		
Vulnerability	0.336	24
Coping Capacity	0.721	2

Arequipa: Coping Capacity

Arequipa's coping capacity is **2nd out of 25** with a score of **0.721**. Though overall coping capacity is very high in the region, thematic weaknesses exist in the areas of **Environmental Capacity** and **Transportation Infrastructure**, indicated by lower relative scores. These thematic areas may influence and constrain Coping Capacity within this region.

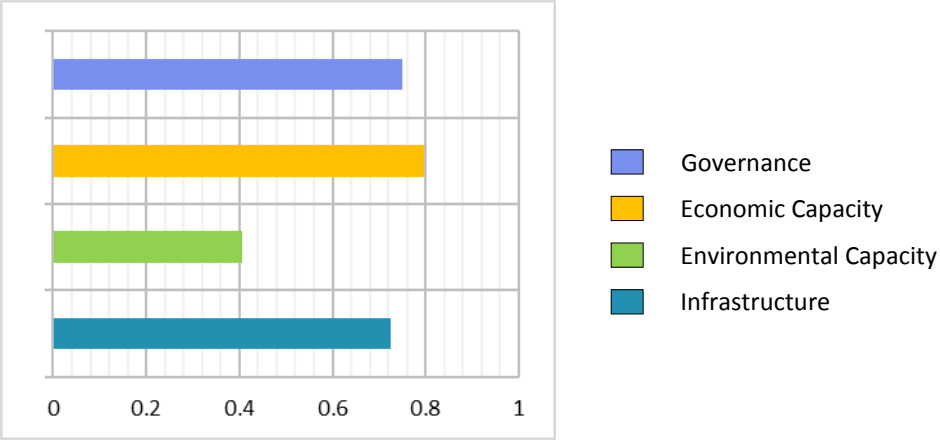


Figure 70. Coping Capacity subcomponents for Arequipa

Table 64. Coping Capacity Index, subcomponent and sub-index scores for Arequipa

Index	Arequipa	
	Score	Rank
Coping Capacity	0. 721	2
Subcomponents		
Governance	0. 751	2
Economic Capacity	0. 797	4
Environmental Capacity	0. 406	7
Infrastructure	0. 724	3
Infrastructure Sub-indices		
Health Care	0. 893	1
Transportation	0. 440	18
Communications	0. 838	3

Arequipa: Vulnerability

Arequipa ranks **24th out of 25** on the Vulnerability Index with a score of **0.336**. Though vulnerability in Arequipa is relatively low, the index is influenced by a high **Population Pressures** subcomponent score.

Table 65. Vulnerability Index and subcomponent index scores for Arequipa

Index	Arequipa	
	Score	Rank
Vulnerability	0. 336	24
Subcomponents		
Economic Constraints	0. 239	20
Info Access Vulnerability	0. 199	23
Vulnerable Health Status	0. 317	20
Clean Water Vulnerability	0. 184	20
Population Pressures	0. 633	10
Environmental Stress	0. 394	12
Recent Disaster Impacts	0. 419	11
Gender Inequality	0. 305	22

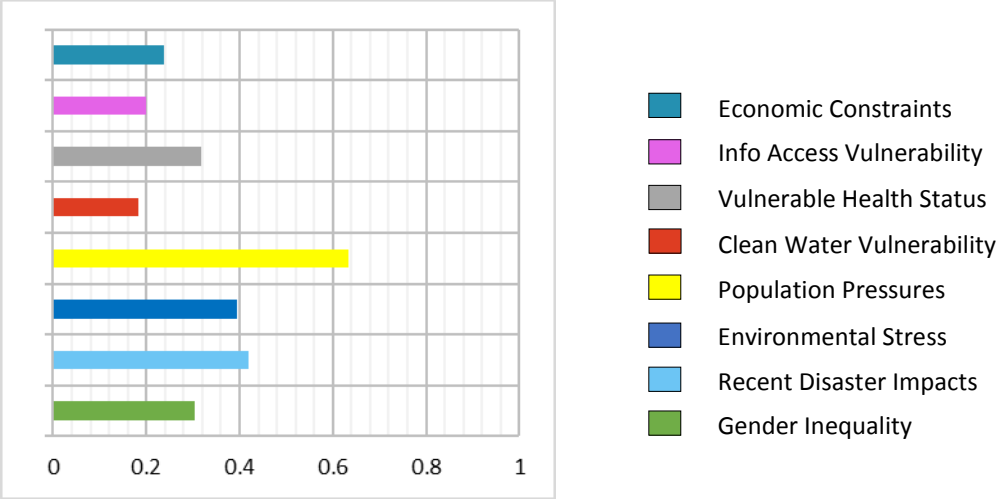


Figure 71. Vulnerability subcomponents for Arequipa

Arequipa: Multi-Hazard Exposure

Arequipa ranks **5th out of 25** on the MHE index with a score of **0.738**. Both a large number of people and a significant proportion of the population are exposed to **seismic activity**, **volcanic ash, mass movement,** and **flood**. While Arequipa is also exposed to tsunami and low temperature, these hazards affect relatively low proportions of the population.

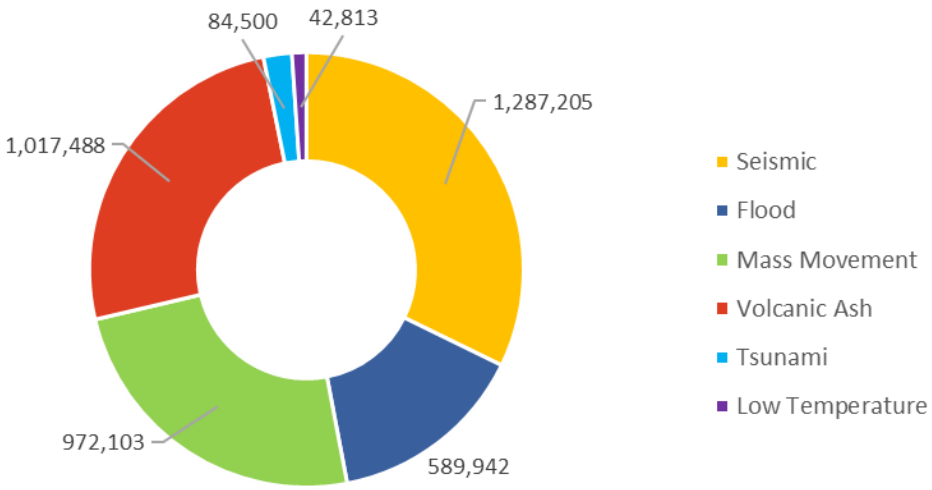


Figure 72. Raw population exposure by hazard type for Arequipa

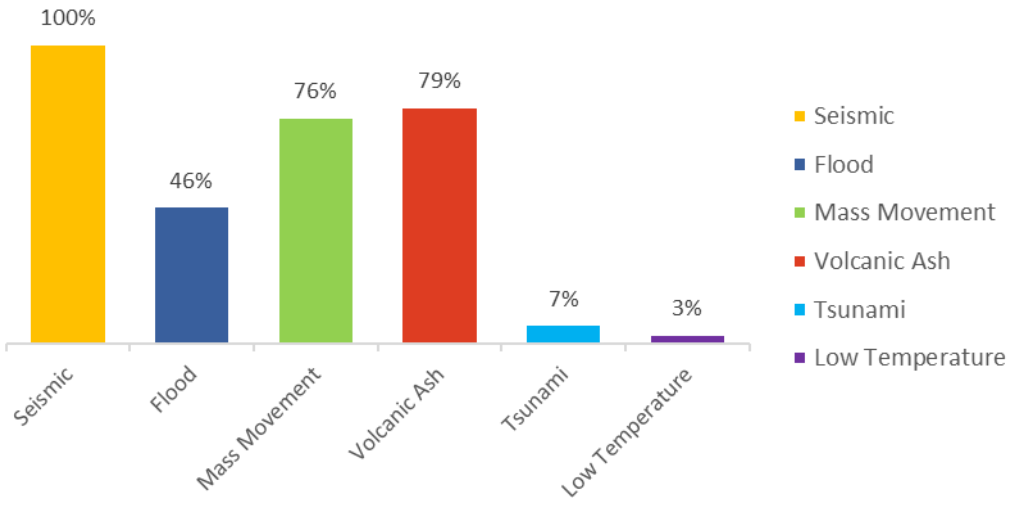


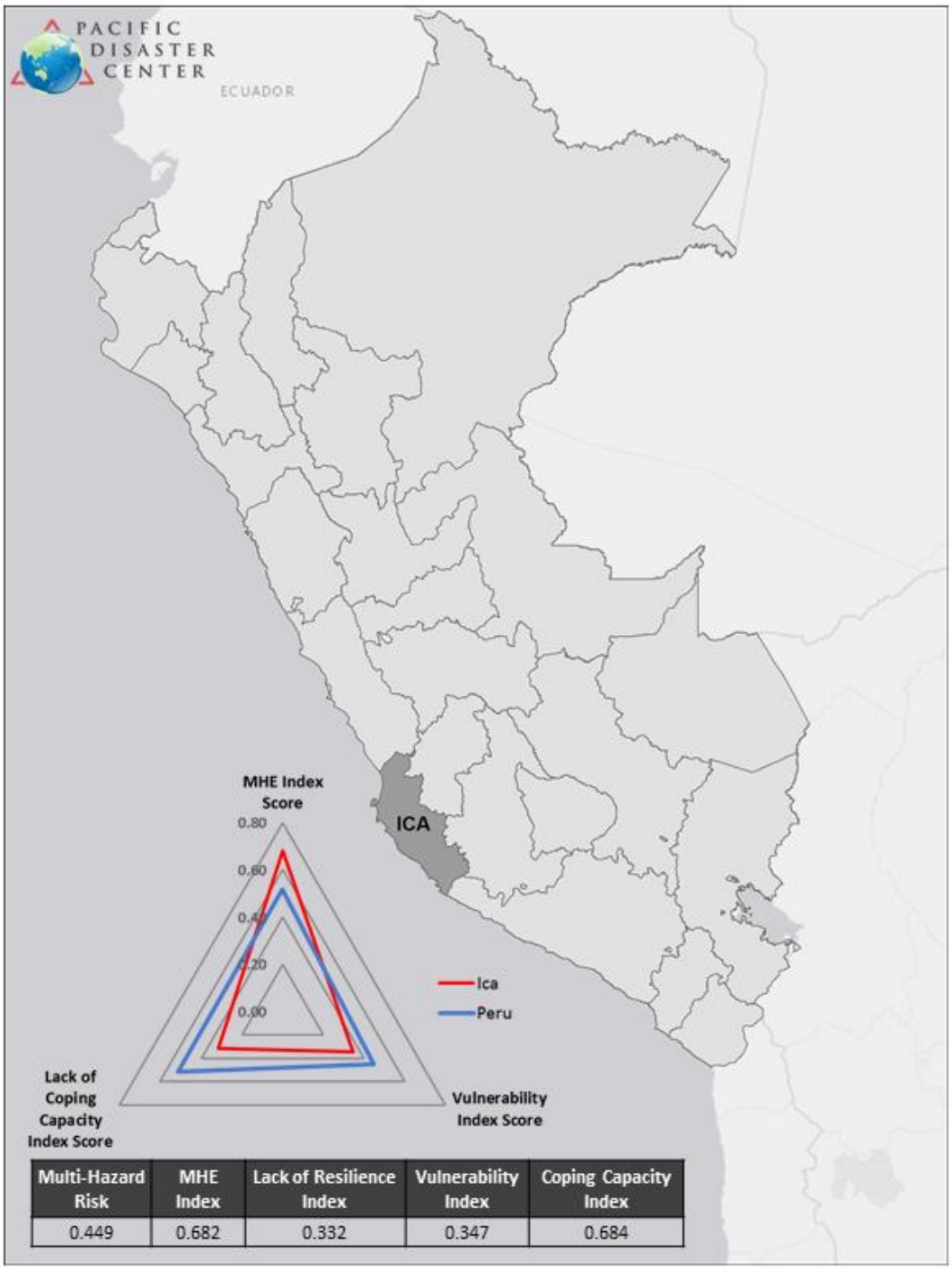
Figure 73. Percent population exposure to hazard type for Arequipa

Table 66. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Arequipa

Index	Arequipa	
	Score	**Rank**
Multi-Hazard Exposure	0. 738	5
Subcomponents		
Raw Exposure	0. 701	6
Relative Exposure	0. 775	7

Ica: Risk

Ica ranks **17 of 25** on the **Multi-Hazard Risk Index** with a score of **0.449**. Ica's score and ranking are due to high Multi-Hazard Exposure combined with very high Coping Capacity and very low Vulnerability scores. Ica has the 9th highest MHE in the country, the 21st highest Vulnerability, and the 3rd highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.449	0.682	0.332	0.347	0.684

Ica: Lack of Resilience

Ica ranks **22 of 25** on the **Lack of Resilience Index** with a score of **0.332**. Ica's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Ica has the 21st highest Vulnerability and the 3rd highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Ica are: **Environmental Stress**, **Population Pressures**, and **Environmental Capacity.**

Table 67. Lack of Resilience Index and Component scores for Ica

Index	Ica	
	Score	**Rank**
Lack of Resilience	0.332	22
Components		
Vulnerability	0.347	21
Coping Capacity	0.684	3

Ica: Coping Capacity

Ica's coping capacity is **3rd out of 25** with a score of **0.684**. Though overall coping capacity is very high in the region, thematic weaknesses exist in the areas of **Environmental Capacity** and **Transportation Infrastructure**, indicated by lower relative scores. These thematic areas may influence and constrain Coping Capacity within this region.

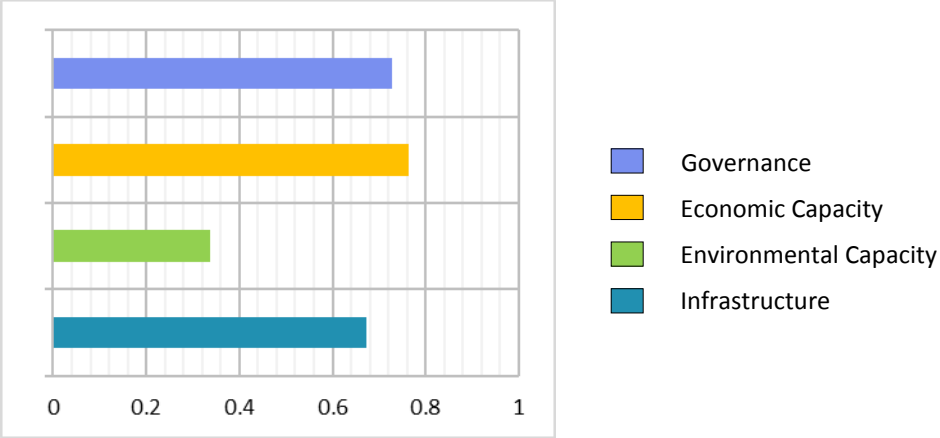


Figure 74. Coping Capacity subcomponents for Ica

Table 68. Coping Capacity Index, subcomponent and sub-index scores for Ica

Index	Ica	
	Score	**Rank**
Coping Capacity	0. 684	3
Subcomponents		
Governance	0. 727	3
Economic Capacity	0. 764	5
Environmental Capacity	0. 336	10
Infrastructure	0. 674	5
Infrastructure Sub-indices		
Health Care	0. 733	3
Transportation	0. 516	13
Communications	0. 773	5

Ica: Vulnerability

Ica ranks **21st out of 25** on the Vulnerability Index with a score of **0.347**. Though vulnerability in Ica is relatively low, the index is influenced by **Environmental Stress** and **Population Pressures** subcomponent scores.

Table 69. Vulnerability Index and subcomponent index scores for Ica

Index	Ica	
	Score	**Rank**
Vulnerability	0. 347	21
Subcomponents		
Economic Constraints	0. 294	18
Info Access Vulnerability	0. 215	22
Vulnerable Health Status	0. 191	25
Clean Water Vulnerability	0. 143	21
Population Pressures	0. 583	12
Environmental Stress	0. 701	5
Recent Disaster Impacts	0. 284	15
Gender Inequality	0. 366	20

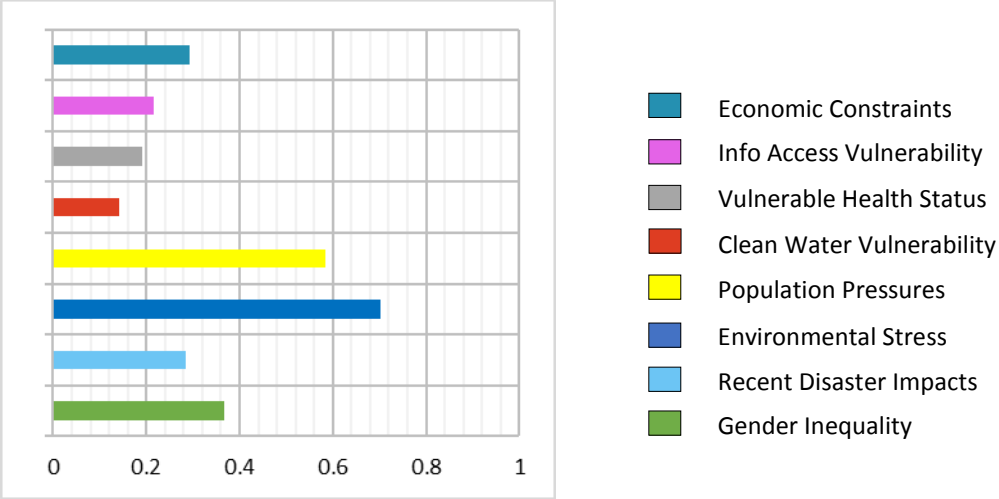


Figure 75. Vulnerability subcomponents for Ica

Ica: Multi-Hazard Exposure

Ica ranks **9th out of 25** on the MHE index with a score of **0.682**. A large proportion of the population is exposed to **seismic activity**, **low temperature, mass movement,** and **flood**. While Ica is also exposed to tsunami, the hazard affects a relatively small proportion of the population.

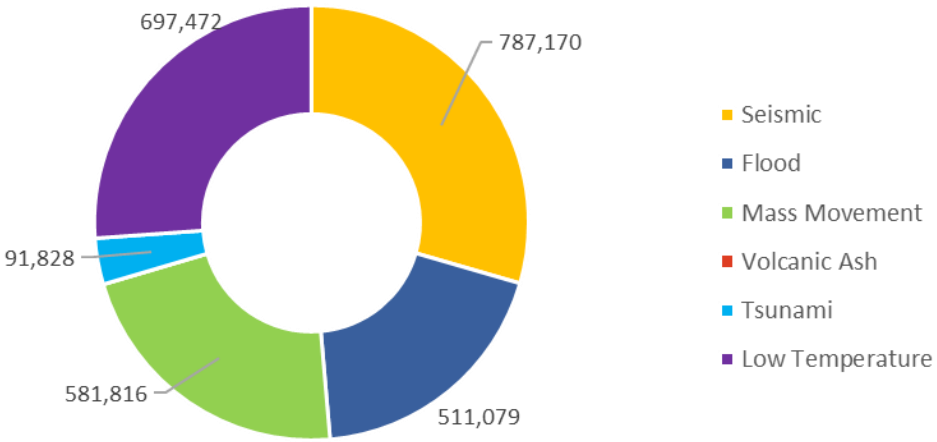


Figure 76. Raw population exposure by hazard type for Ica

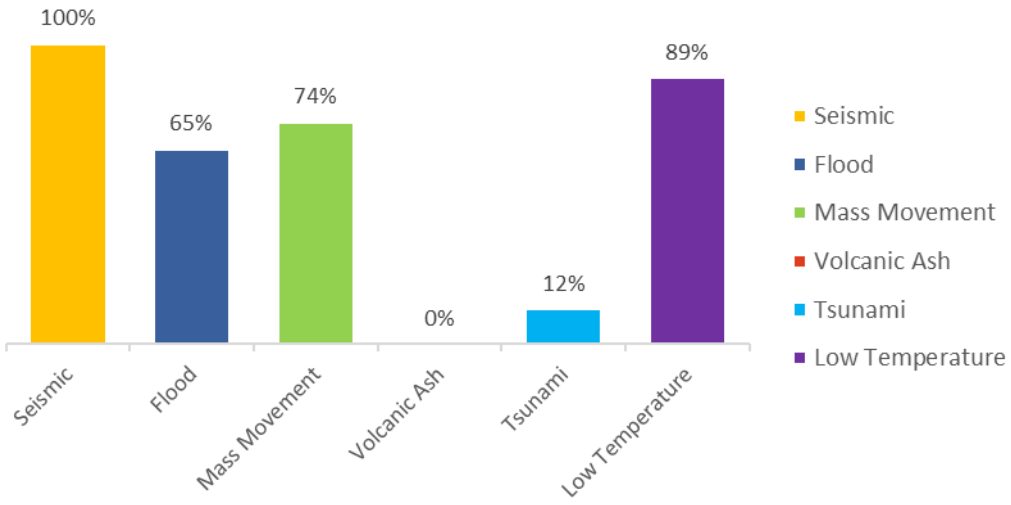


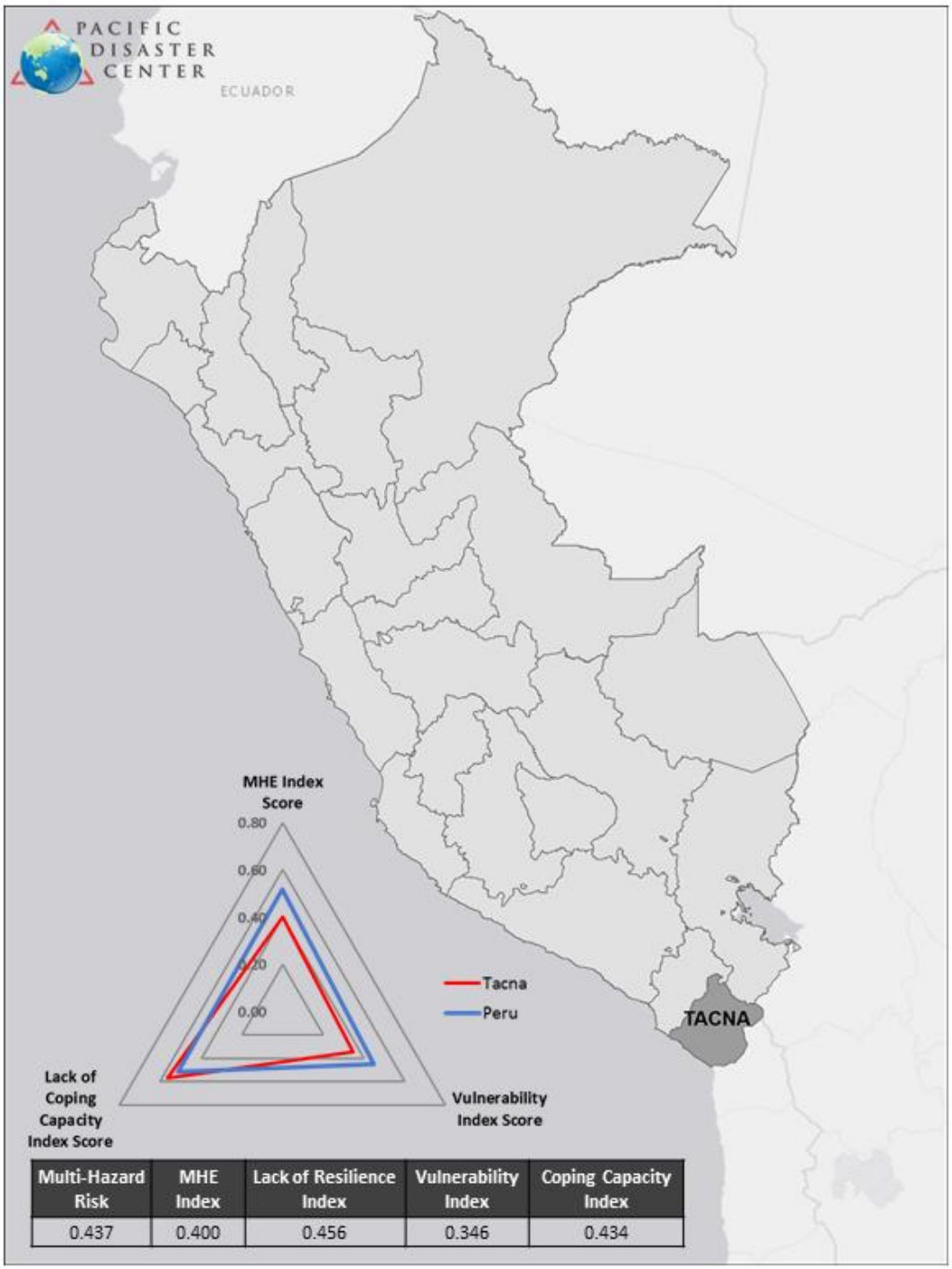
Figure 77. Percent population exposure to hazard type for Ica

Table 70. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Ica

Index	Ica	
	Score	**Rank**
Multi-Hazard Exposure	0. 682	9
Subcomponents		
Raw Exposure	0. 446	13
Relative Exposure	0. 919	3

Tacna: Risk

Tacna ranks **18 of 25** on the **Multi-Hazard Risk Index** with a score of **0.437**. Tacna's score and ranking are due to low Multi-Hazard Exposure combined with low Coping Capacity and very low Vulnerability scores. Tacna has the 18th highest MHE in the country, the 22nd highest Vulnerability, and the 17th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.437	0.400	0.456	0.346	0.434

Tacna: Lack of Resilience

Tacna ranks **17 of 25** on **Lack of Resilience Index** with a score of **0.456**. Tacna's score and ranking are due to very low Vulnerability combined with low Coping Capacity scores. Tacna has the 22nd highest Vulnerability and the 17th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Tacna are: **Governance**, **Environmental Capacity**, and **Population Pressures.**

Table 71. Lack of Resilience Index and Component scores for Tacna

Index	Tacna	
	Score	**Rank**
Lack of Resilience	0.456	17
Components		
Vulnerability	0.346	22
Coping Capacity	0.434	17

Tacna: Coping Capacity

Tacna's coping capacity is **17th out of 25** with a score of **0.434**. The thematic areas with the weakest relative scores are **Environmental Capacity** and **Governance**. These thematic areas appear to constrain Coping Capacity within this region.

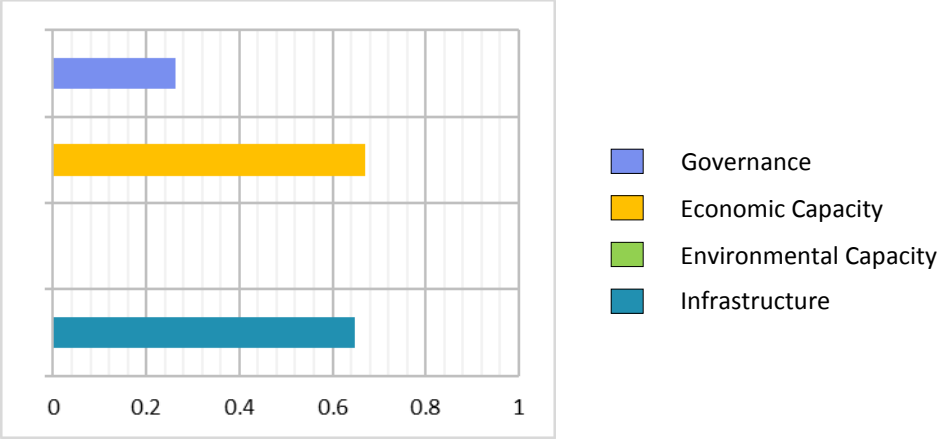


Figure 78. Coping Capacity subcomponents for Tacna

Table 72. Coping Capacity Index, subcomponent and sub-index scores for Tacna

Index	Tacna	
	Score	Rank
Coping Capacity	0. 434	17
Subcomponents		
Governance	0. 262	25
Economic Capacity	0. 671	7
Environmental Capacity	0. 000	23
Infrastructure	0. 647	6
Infrastructure Sub-indices		
Health Care	0. 670	5
Transportation	0. 535	11
Communications	0. 737	7

Tacna: Vulnerability

Tacna ranks **22nd out of 25** on the Vulnerability Index with a score of **0.346**. Though vulnerability in Tacna is relatively low, the index is influenced by a high **Population Pressures** subcomponent score.

Table 73. Vulnerability Index and subcomponent index scores for Tacna

Index	Tacna	
	Score	Rank
Vulnerability	0. 346	22
Subcomponents		
Economic Constraints	0. 235	21
Info Access Vulnerability	0. 231	21
Vulnerable Health Status	0. 393	19
Clean Water Vulnerability	0. 070	22
Population Pressures	0. 821	5
Environmental Stress	0. 426	11
Recent Disaster Impacts	0. 340	14
Gender Inequality	0. 251	24

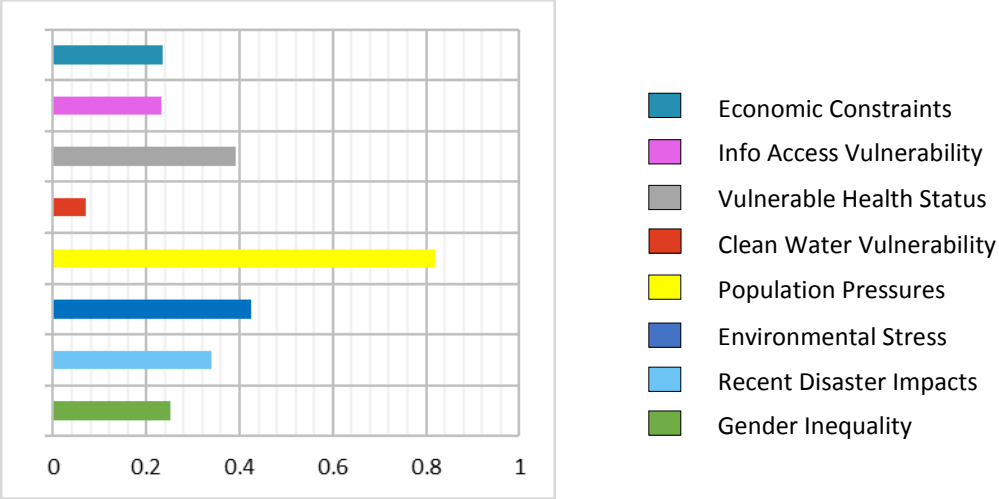


Figure 79. Vulnerability subcomponents for Tacna

Tacna: Multi-Hazard Exposure

Tacna ranks **18th out of 25** on the MHE index with a score of **0.400**. A large proportion of the population is exposed to **seismic activity, low temperature, mass movement,** and **tsunami**. Though Tacna is also exposed to flood, the hazard affects a relatively small proportion of the population.

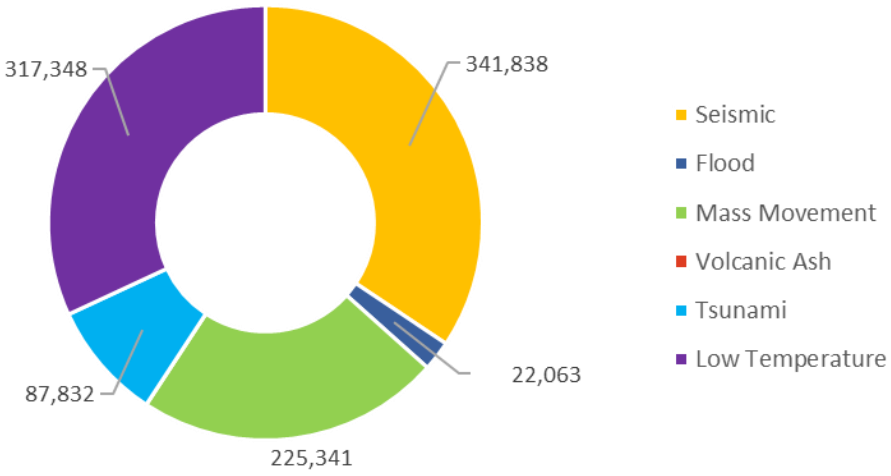


Figure 80. Raw population exposure by hazard type for Tacna

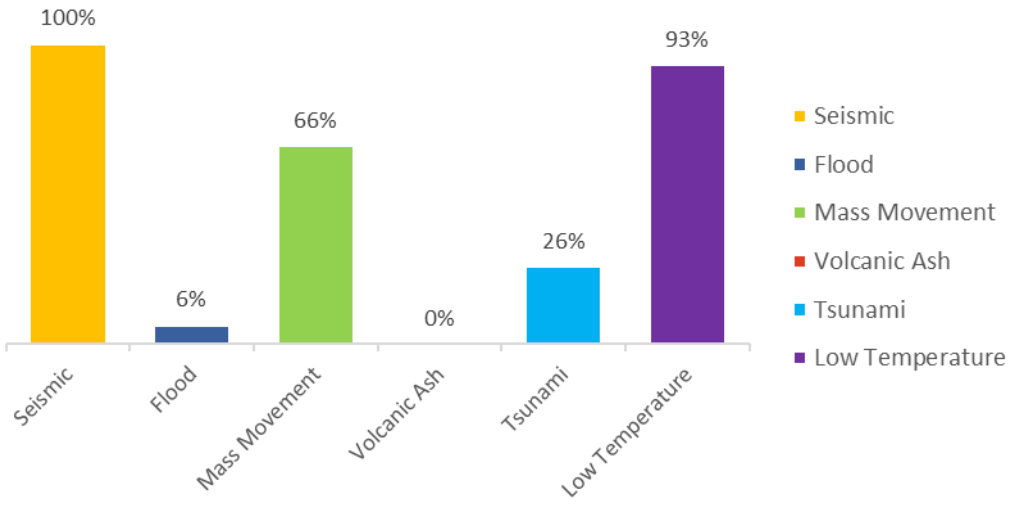


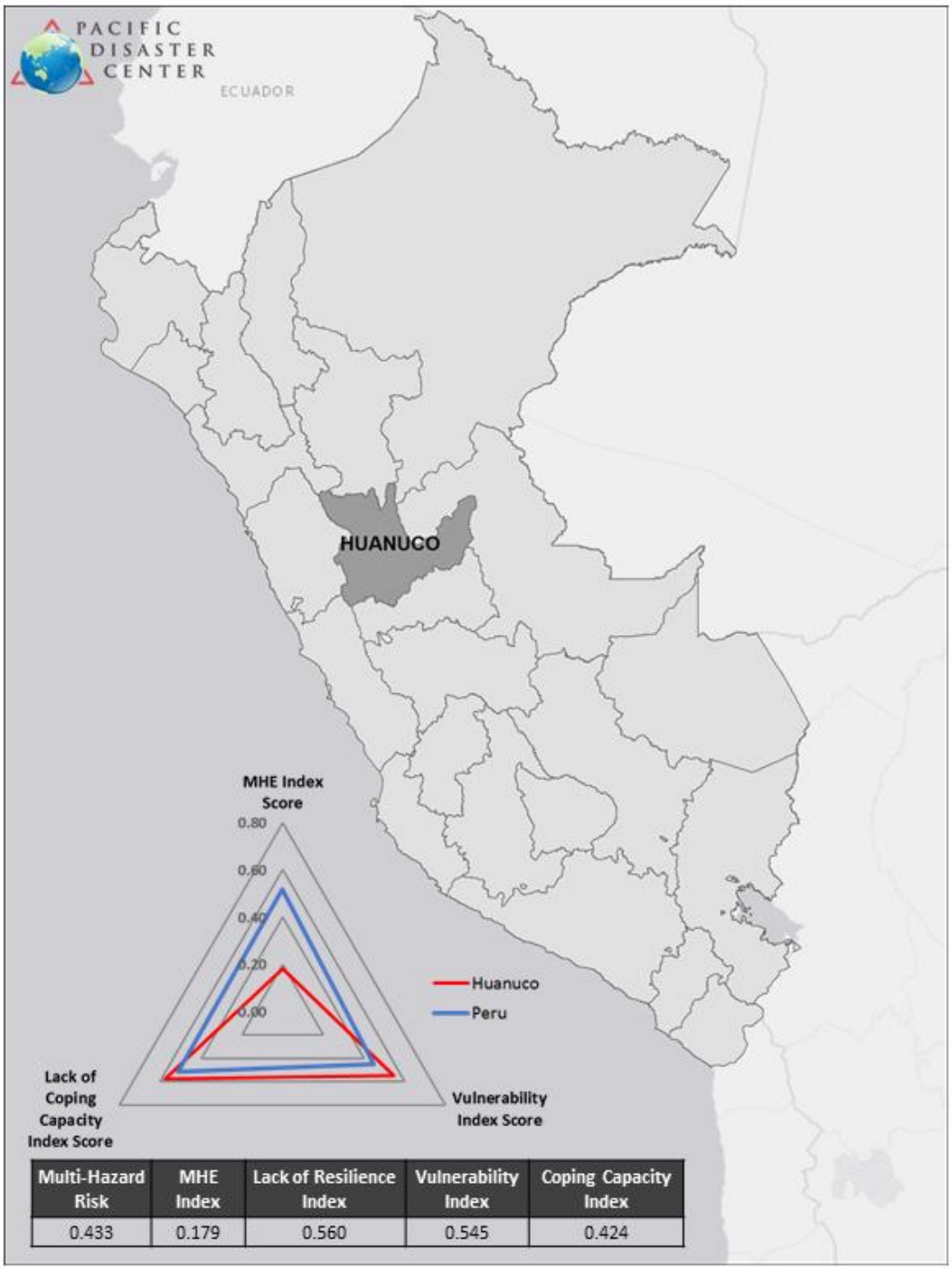
Figure 81. Percent population exposure to hazard type for Tacna

Table 74. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Tacna

Index	Tacna	
	Score	**Rank**
Multi-Hazard Exposure	0. 400	18
Subcomponents		
Raw Exposure	0. 122	20
Relative Exposure	0. 679	12

Huanuco: Risk

Huanuco ranks **19 of 25** on the **Multi-Hazard Risk Index** with a score of **0.433**. Huanuco's score and ranking are due to very low Multi-Hazard Exposure combined with low Coping Capacity and very high Vulnerability scores. Huanuco has the 23rd highest MHE in the country, the 5th highest Vulnerability, and the 18th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.433	0.179	0.560	0.545	0.424

Huanuco: Lack of Resilience

Huanuco ranks **6 of 25** on the **Lack of Resilience Index** with a score of **0.560**. Huanuco's score and ranking are due to very high Vulnerability combined with low Coping Capacity scores. Huanuco has the 5th highest Vulnerability and the 18th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Huanuco are: **Information Access Vulnerability**, **Economic Capacity**, and **Environmental Capacity.**

Table 75. Lack of Resilience Index and Component scores for Huanuco

Index	Huanuco	
	Score	**Rank**
Lack of Resilience	0.560	6
Components		
Vulnerability	0.545	5
Coping Capacity	0.424	18

Huanuco: Coping Capacity

Huanuco's coping capacity is **18th out of 25** with a score of **0.424**. The thematic areas with the weakest relative scores are **Economic Capacity, Environmental Capacity,** and **Health Care Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

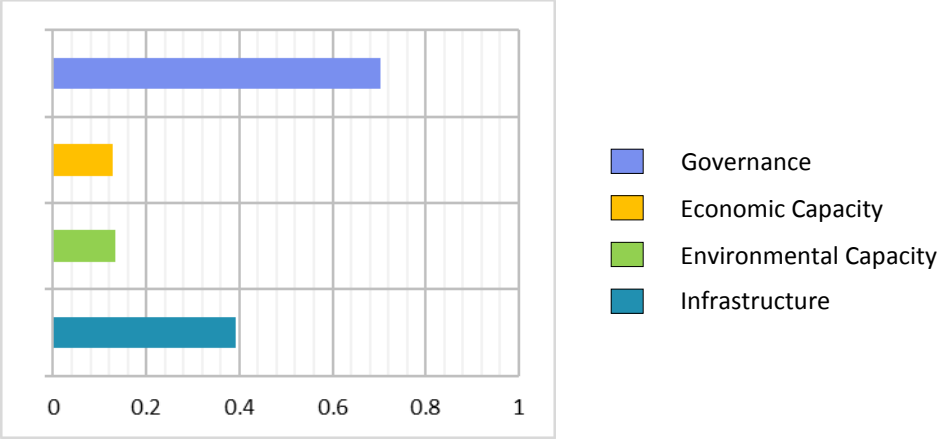


Figure 82. Coping Capacity subcomponents for Huanuco

Table 76. Coping Capacity Index, subcomponent and sub-index scores for Huanuco

Index	Huanuco	
	Score	Rank
Coping Capacity	0. 424	18
Subcomponents		
Governance	0. 703	6
Economic Capacity	0. 128	23
Environmental Capacity	0. 133	15
Infrastructure	0. 392	16
Infrastructure Sub-indices		
Health Care	0. 267	19
Transportation	0. 446	17
Communications	0. 463	15

Huanuco: Vulnerability

Huanuco ranks **5th out of 25** on the Vulnerability Index with a score of **0.545**. Vulnerability in Huanuco is strongly influenced by **Information Access Vulnerability**, **Gender Inequality, Clean Water Vulnerability,** and **Economic Constraints** subcomponent scores.

Table 77. Vulnerability Index and subcomponent index scores for Huanuco

Index	Huanuco	
	Score	Rank
Vulnerability	0. 545	5
Subcomponents		
Economic Constraints	0. 602	6
Info Access Vulnerability	0. 768	2
Vulnerable Health Status	0. 552	7
Clean Water Vulnerability	0. 685	6
Population Pressures	0. 380	17
Environmental Stress	0. 329	15
Recent Disaster Impacts	0. 420	10
Gender Inequality	0. 626	4

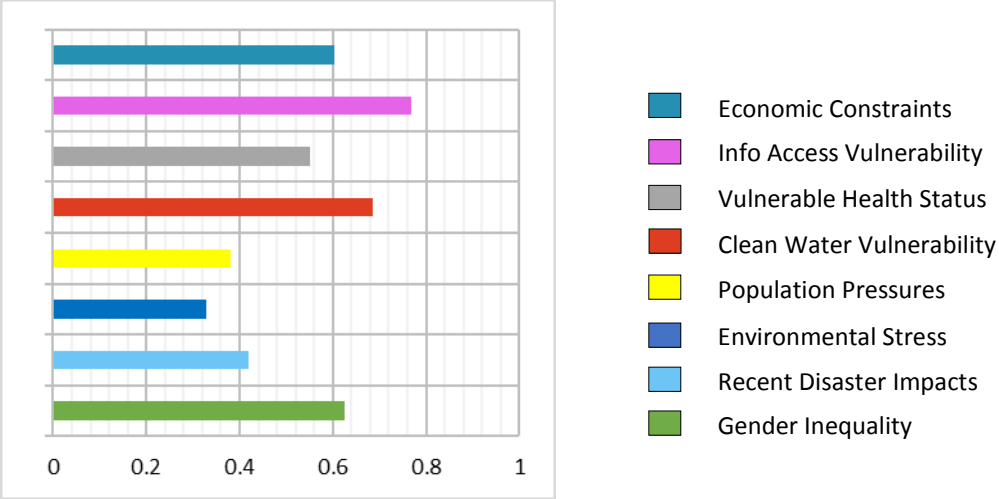


Figure 83. Vulnerability subcomponents for Huanuco

Huanuco: Multi-Hazard Exposure

Huanuco ranks **23rd out of 25** on the MHE index with a score of **0.179**. Despite this low rank, a significant proportion of the population is exposed to **seismic activity**, **mass movement, flood**, **tsunami,** and **volcanic ash**. A small proportion of Huanuco's population is also exposed to low temperature.

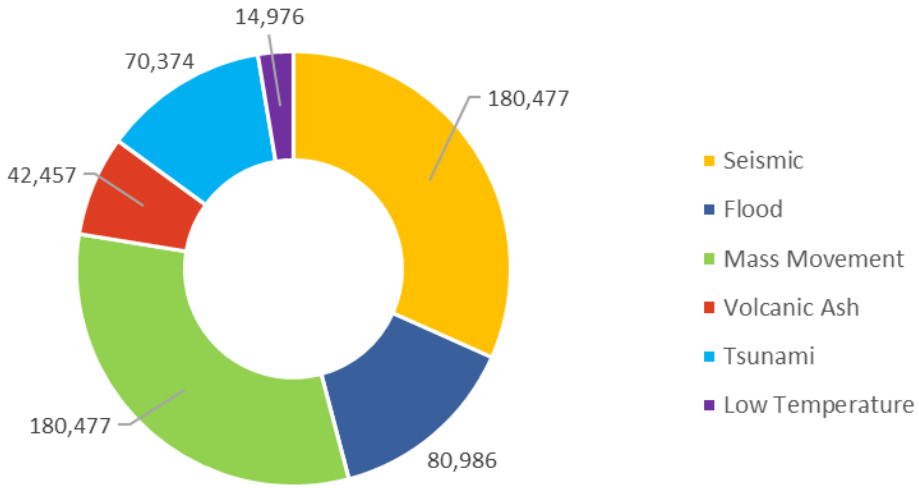


Figure 84. Raw population exposure by hazard type for Huanuco

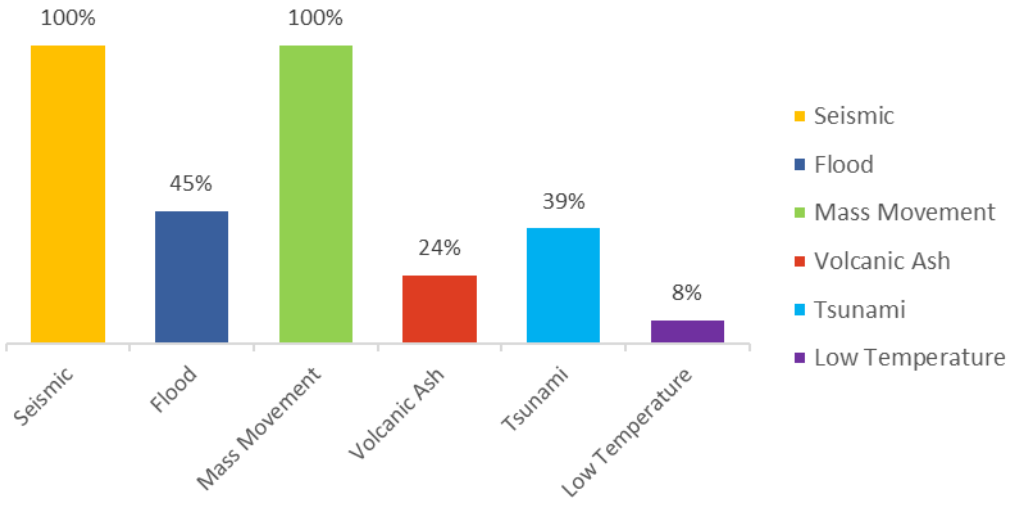


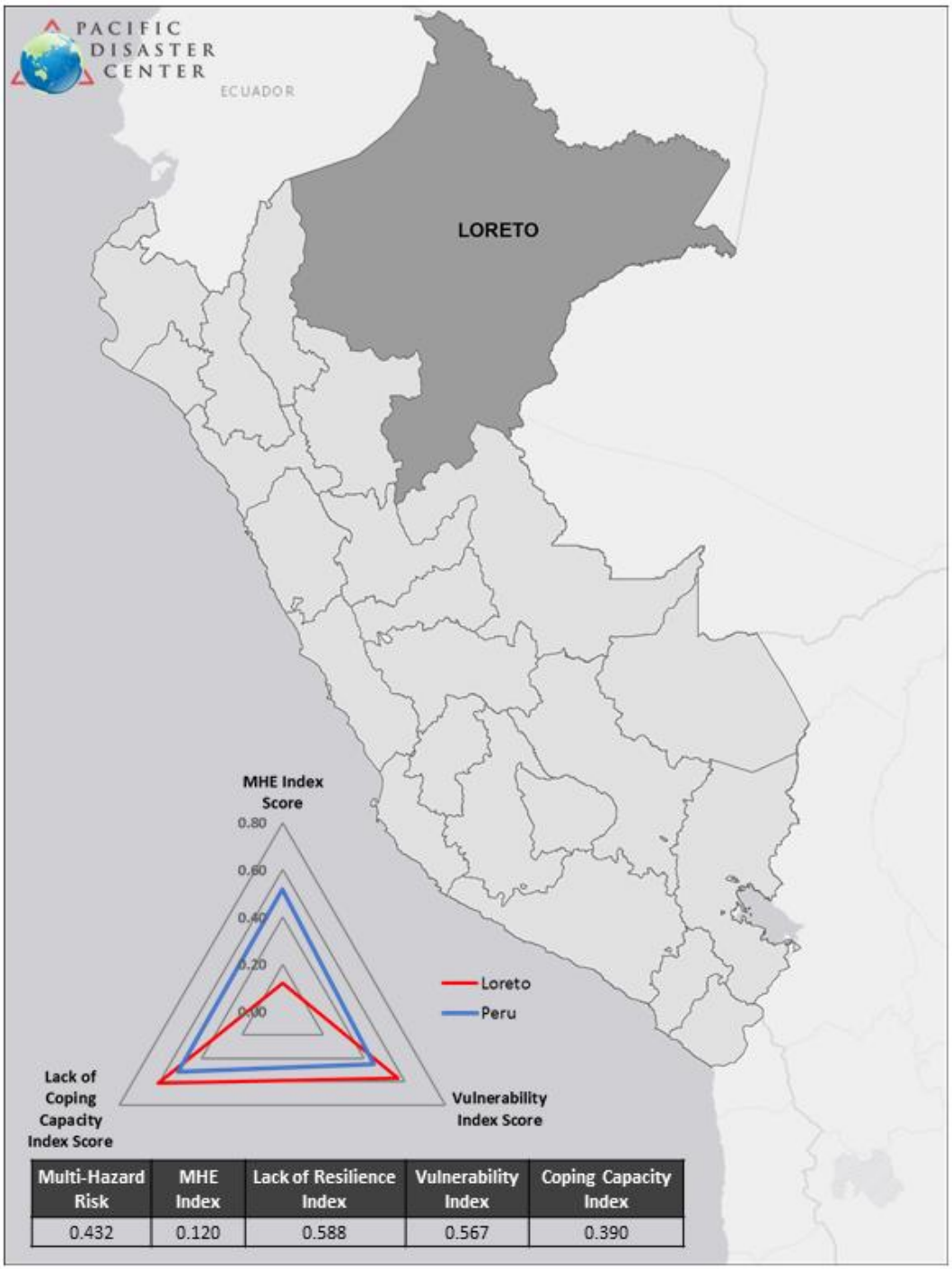
Figure 85. Percent population exposure to hazard type for Huanuco

Table 78. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Huanuco

Index	Huanuco	
	Score	**Rank**
Multi-Hazard Exposure	0. 179	23
Subcomponents		
Raw Exposure	0. 230	15
Relative Exposure	0. 128	24

Loreto: Risk

Loreto ranks **20 of 25** on the **Multi-Hazard Risk Index** with a score of **0.432**. Loreto's score and ranking are due to very low Multi-Hazard Exposure combined with low Coping Capacity and very high Vulnerability scores. While Loreto ranks lowest in the country in MHE at 25th of 25, it has the 3rd highest Vulnerability and 20th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.432	0.120	0.588	0.567	0.390

Loreto: Lack of Resilience

Loreto ranks **5 of 25** on the **Lack of Resilience Index** with a score of **0.588**. Loreto's score and ranking are due to very high Vulnerability combined with low Coping Capacity scores. Loreto has the 3rd highest Vulnerability and the 20th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Loreto are: **Clean Water Vulnerability**, **Infrastructure**, and **Recent Disaster Impacts.**

Table 79. Lack of Resilience Index and Component scores for Loreto

Index	Loreto	
	Score	**Rank**
Lack of Resilience	0.588	5
Components		
Vulnerability	0.567	3
Coping Capacity	0.390	20

Loreto: Coping Capacity

Loreto's coping capacity is **20th out of 25** with a score of **0.390**. The thematic areas with the weakest relative scores are **Infrastructure** and **Economic Capacity**. These thematic areas appear to constrain Coping Capacity within this region.

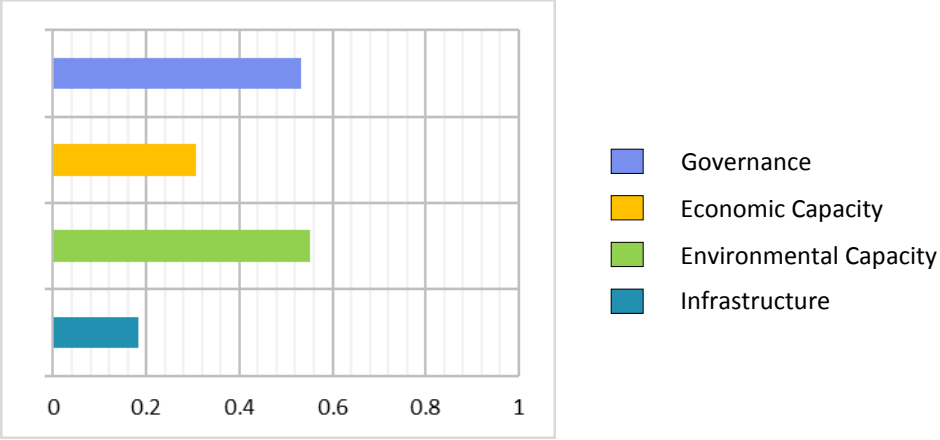


Figure 86. Coping Capacity subcomponents for Loreto

Table 80. Coping Capacity Index, subcomponent and sub-index scores for Loreto

Index	Loreto	
	Score	Rank
Coping Capacity	0. 390	20
Subcomponents		
Governance	0. 532	18
Economic Capacity	0. 306	15
Environmental Capacity	0. 551	6
Infrastructure	0. 184	25
Infrastructure Sub-indices		
Health Care	0. 139	22
Transportation	0. 138	24
Communications	0. 275	23

Loreto: Vulnerability

Loreto ranks **3rd out of 25** on the Vulnerability Index with a score of **0.567**. Vulnerability in Loreto is strongly influenced by **Clean Water Vulnerability, Recent Disaster Impacts, Population Pressures,** and **Information Access Vulnerability** subcomponent scores.

Table 81. Vulnerability Index and subcomponent index scores for Loreto

Index	Loreto	
	Score	Rank
Vulnerability	0. 567	3
Subcomponents		
Economic Constraints	0. 480	14
Info Access Vulnerability	0. 640	7
Vulnerable Health Status	0. 514	11
Clean Water Vulnerability	0. 931	1
Population Pressures	0. 647	9
Environmental Stress	0. 001	24
Recent Disaster Impacts	0. 796	1
Gender Inequality	0. 528	10

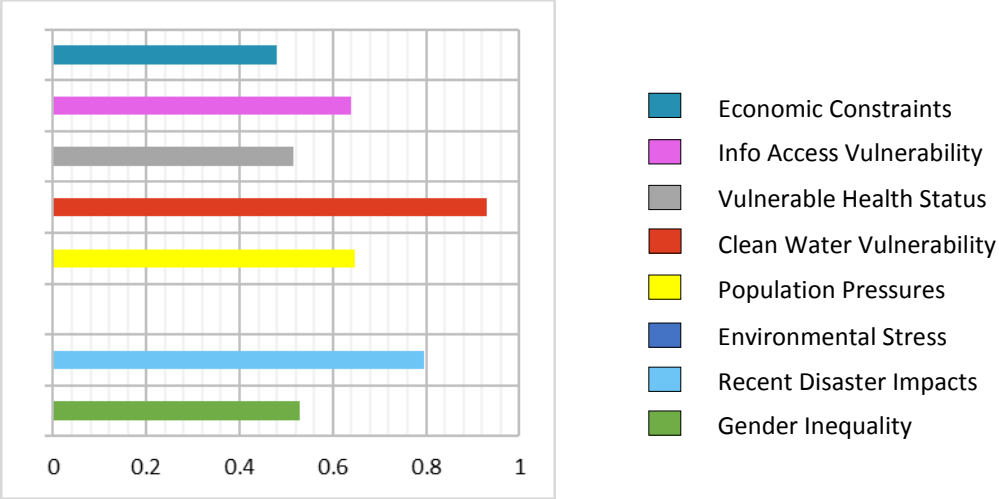


Figure 87. Vulnerability subcomponents for Loreto

Loreto: Multi-Hazard Exposure

Loreto ranks **25th out of 25** on the MHE index with a score of **0.120**. Despite the low rank, a significant proportion of the population is exposed to **flood, mass movement, low temperature,** and **seismic activity**.

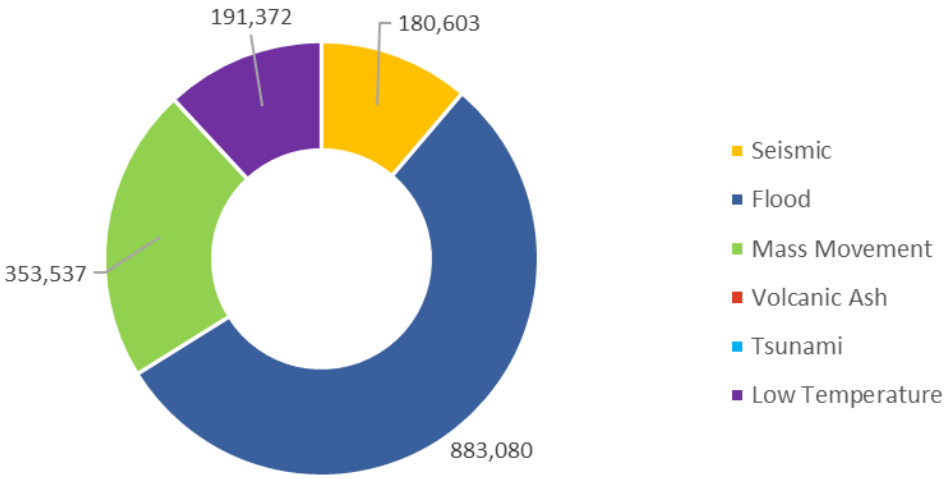


Figure 88. Raw population exposure by hazard type for Loreto

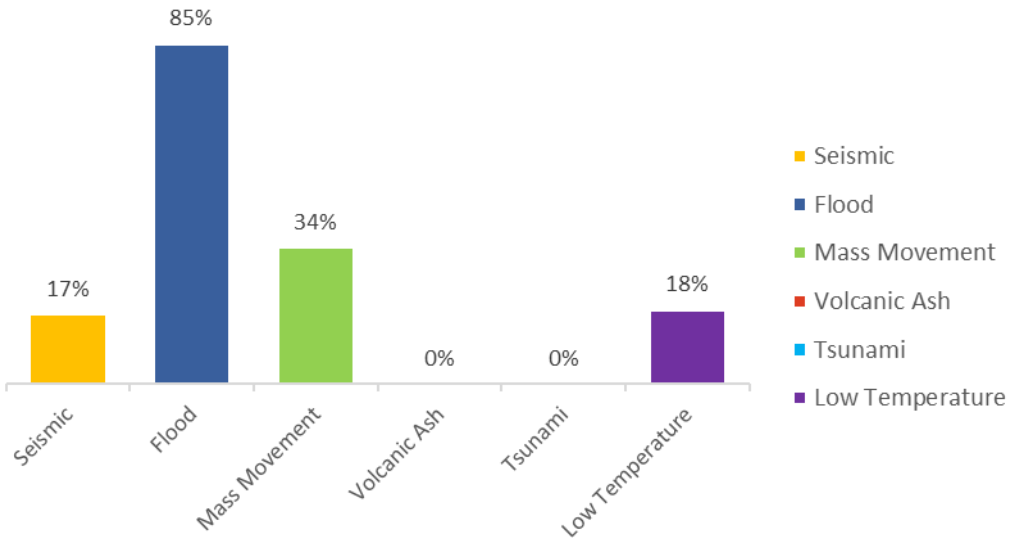


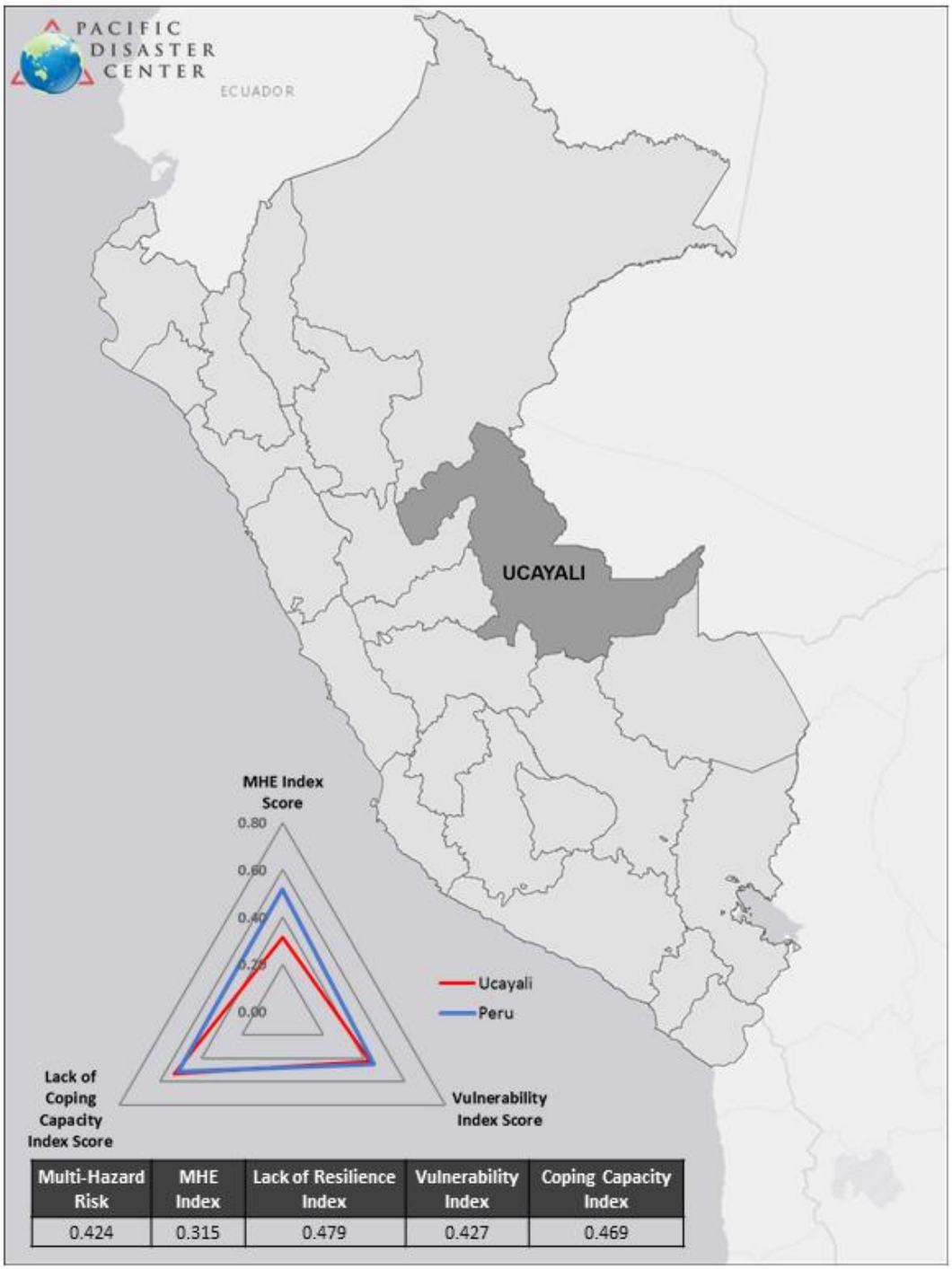
Figure 89. Percent population exposure to hazard type for Loreto

Table 82. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Loreto

Index	Loreto	
	Score	**Rank**
Multi-Hazard Exposure	0. 120	25
Subcomponents		
Raw Exposure	0. 241	14
Relative Exposure	0. 000	25

Ucayali: Risk

Ucayali ranks **21 of 25** on the **Multi-Hazard Risk Index** with a score of **0.424**. Ucayali's score and ranking are due to low Multi-Hazard Exposure combined with moderate Coping Capacity and moderate Vulnerability scores. Ucayali has the 20th highest MHE in the country, the 14th highest Vulnerability, and the 13th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.424	0.315	0.479	0.427	0.469

Ucayali: Lack of Resilience

Ucayali ranks **12 of 25** on the **Lack of Resilience Index** with a score of **0.479**. Ucayali's score and ranking are due to moderate Vulnerability combined with moderate Coping Capacity scores. Ucayali has the 14th highest Vulnerability and the 13th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Ucayali are: **Clean Water Vulnerability**, **Infrastructure**, and **Economic Capacity.**

Table 83. Lack of Resilience Index and Component scores for Ucayali

Index	Ucayali	
	Score	**Rank**
Lack of Resilience	0.479	12
Components		
Vulnerability	0.427	14
Coping Capacity	0.469	13

Ucayali: Coping Capacity

Ucayali's coping capacity is **13th out of 25** with a score of **0.469**. The thematic areas with the weakest relative scores are **Economic Capacity** and **Infrastructure** (especially **Transportation Infrastructure**). These thematic areas appear to constrain Coping Capacity within this region.

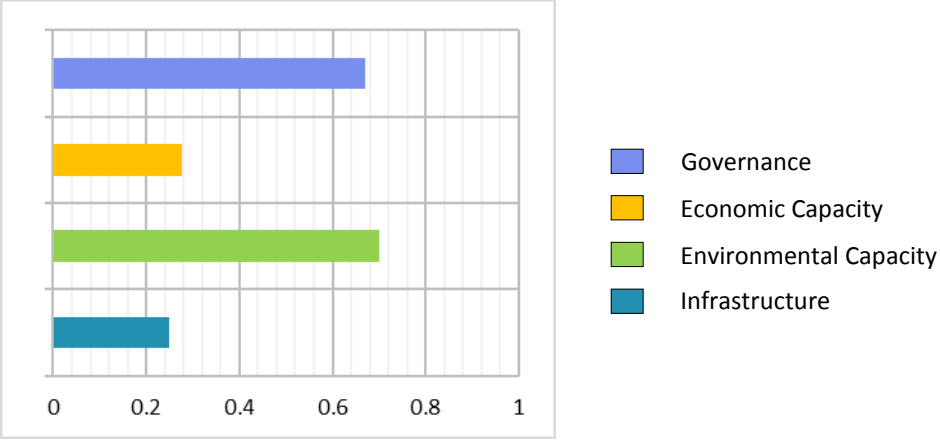


Figure 90. Coping Capacity subcomponents for Ucayali

Table 84. Coping Capacity Index, subcomponent and sub-index scores for Ucayali

Index	Ucayali	
	Score	**Rank**
Coping Capacity	0. 469	13
Subcomponents		
Governance	0. 669	8
Economic Capacity	0. 227	16
Environmental Capacity	0. 701	4
Infrastructure	0. 248	24
Infrastructure Sub-indices		
Health Care	0. 270	18
Transportation	0. 013	25
Communications	0. 461	16

Ucayali: Vulnerability

Ucayali ranks **14th out of 25** on the Vulnerability Index with a score of **0.427**. Vulnerability in Ucayali is strongly influenced by the **Clean Water Vulnerability** subcomponent score.

Table 85. Vulnerability Index and subcomponent index scores for Ucayali

Index	Ucayali	
	Score	**Rank**
Vulnerability	0. 427	14
Subcomponents		
Economic Constraints	0. 350	17
Info Access Vulnerability	0. 488	13
Vulnerable Health Status	0. 532	10
Clean Water Vulnerability	0. 923	2
Population Pressures	0. 029	24
Environmental Stress	0. 017	23
Recent Disaster Impacts	0. 573	7
Gender Inequality	0. 504	14

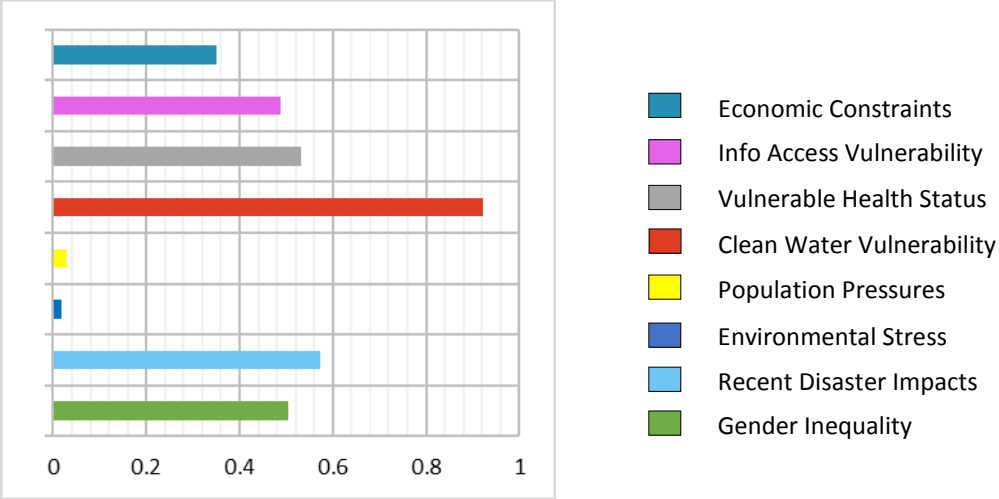


Figure 91. Vulnerability subcomponents for Ucayali

Ucayali: Multi-Hazard Exposure

Ucayali ranks **20th out of 25** on the MHE index with a score of **0.315**. Despite the low rank, a significant proportion of the population is exposed to **flood, low temperature,** and **mass movement.** A small proportion of Ucayali's population is also exposed to seismic activity.

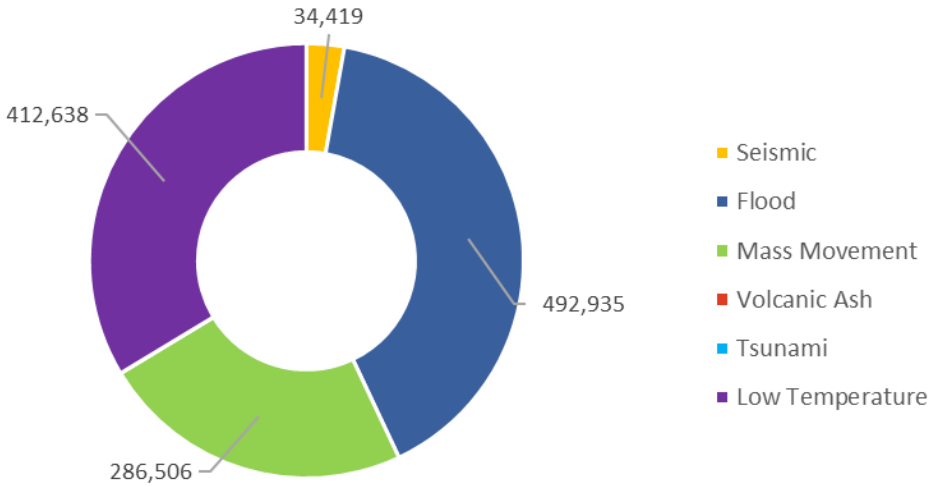


Figure 92. Raw population exposure by hazard type for Ucayali

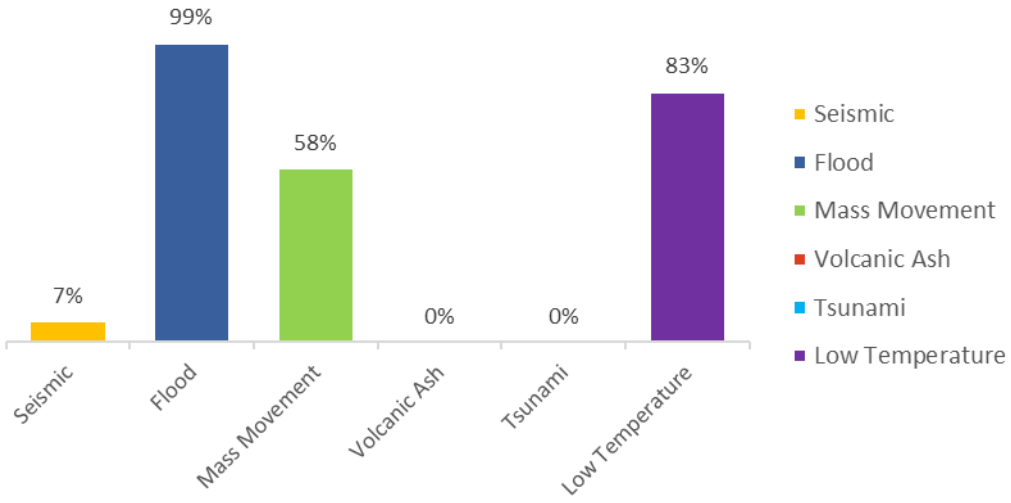


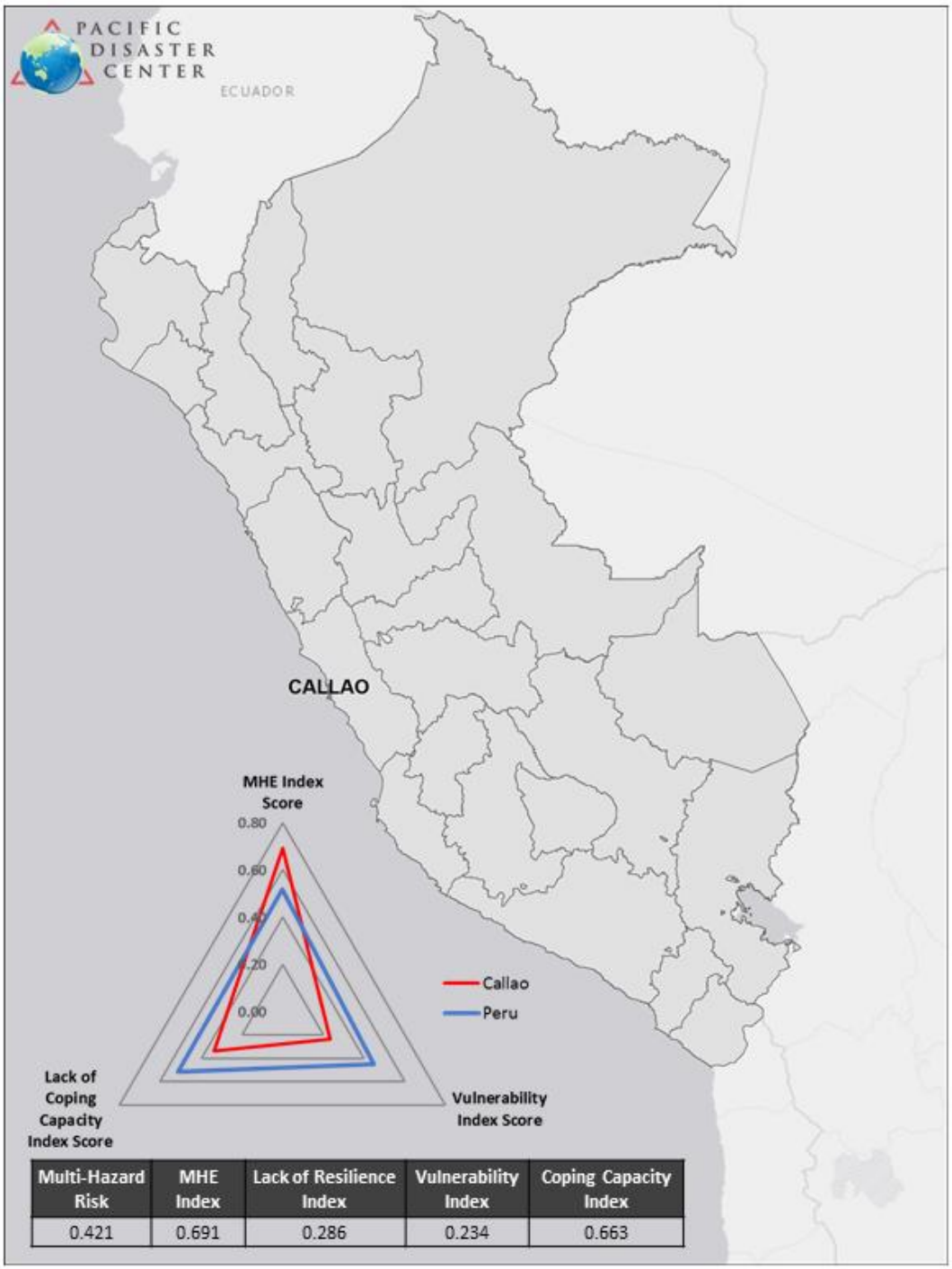
Figure 93. Percent population exposure to hazard type for Ucayali

Table 86. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Ucayali

Index	Ucayali	
	Score	**Rank**
Multi-Hazard Exposure	0. 315	20
Subcomponents		
Raw Exposure	0. 167	19
Relative Exposure	0. 462	20

Callao: Risk

Callao ranks **22 of 25** on the **Multi-Hazard Risk Index** with a score of **0.421**. Callao's score and ranking are due to high Multi-Hazard Exposure combined with very high Coping Capacity and very low Vulnerability scores. Callao has the 8th highest MHE in the country, the 25h highest Vulnerability, and the 4th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.421	0.691	0.286	0.234	0.663

Callao: Lack of Resilience

Callao ranks **24 of 25** on the **Lack of Resilience Index** with a score of **0.286**. Callao's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Callao has the 25th highest Vulnerability and the 4th highest Coping Capacity.

While Callao exhibits minimal Lack of Resilience overall, two thematic areas with weak relative scores for the region of Callao are: **Population Pressures** and **Environmental Capacity.**

Table 87. Lack of Resilience Index and Component scores for Callao

Index	Callao	
	Score	**Rank**
Lack of Resilience	0.286	24
Components		
Vulnerability	0.234	25
Coping Capacity	0.663	4

Callao: Coping Capacity

Callao's coping capacity is **4th out of 25** with a score of **0.663**. Overall, Callao exhibits very high coping capacity in all thematic areas with one exception: **Environmental Capacity.** This thematic area may represent a constraint to Coping Capacity within this region.

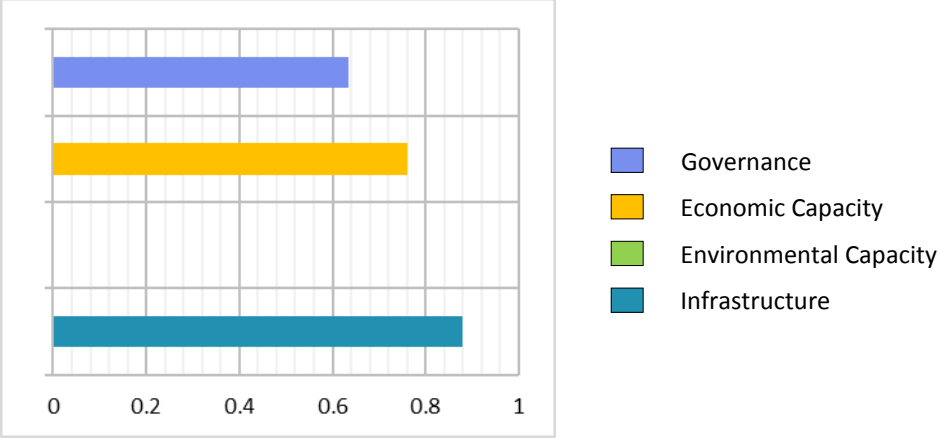


Figure 94. Coping Capacity subcomponents for Callao

Table 88. Coping Capacity Index, subcomponent and sub-index scores for Callao

Index	Callao	
	Score	Rank
Coping Capacity	0. 663	4
Subcomponents		
Governance	0. 633	11
Economic Capacity	0. 760	6
Environmental Capacity	0. 000	23
Infrastructure	0. 880	1
Infrastructure Sub-indices		
Health Care	0. 664	6
Transportation	1. 000	1
Communications	0. 975	2

Callao: Vulnerability

Callao ranks **25th out of 25** on the Vulnerability Index with a score of **0.234**. Though Callao exhibits the lowest vulnerability in the country, the index is influenced by a high **Population Pressures** subcomponent score. Note that the Gender Inequality subcomponent was omitted from the Vulnerability Index for Callao because data were not available.

Table 89. Vulnerability Index and subcomponent index scores for Callao

Index	Callao	
	Score	Rank
Vulnerability	0. 234	25
Subcomponents		
Economic Constraints	0. 145	23
Info Access Vulnerability	0. 167	24
Vulnerable Health Status	0. 304	22
Clean Water Vulnerability	0. 065	23
Population Pressures	0. 903	4
Environmental Stress	0. 057	21
Recent Disaster Impacts	0. 000	25
Gender Inequality	No Data	No Data

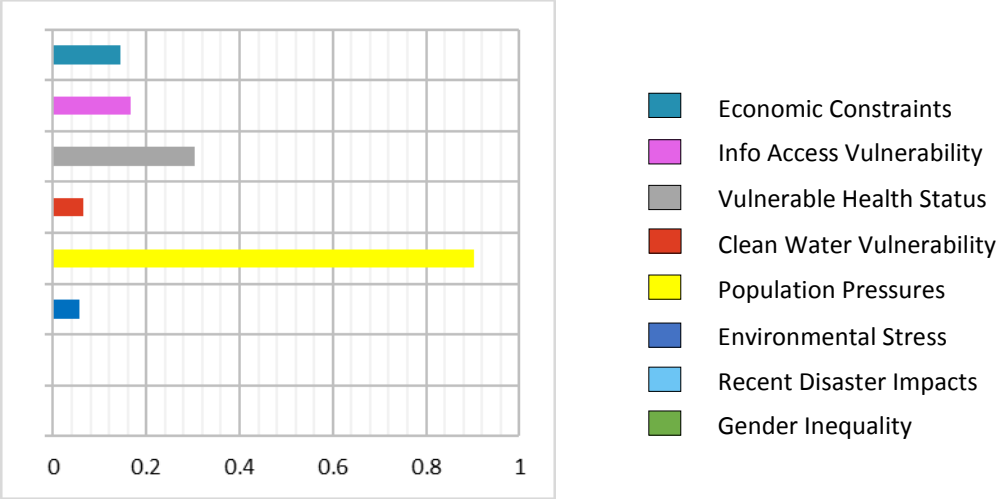


Figure 95. Vulnerability subcomponents for Callao

Callao: Multi-Hazard Exposure

Callao ranks **8th out of 25** on the MHE index with a score of **0.691**. A large proportion of the population is exposed to **seismic activity**, **tsunami, flood,** and **mass movement**.

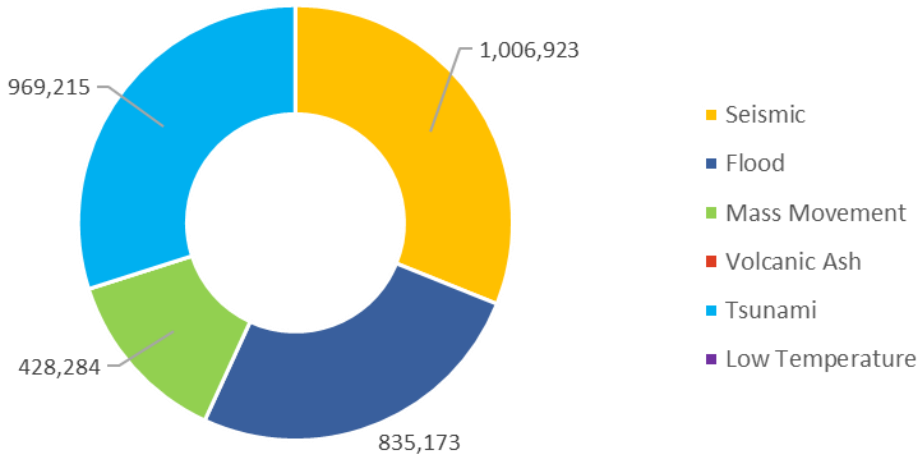


Figure 96. Raw population exposure by hazard type for Callao

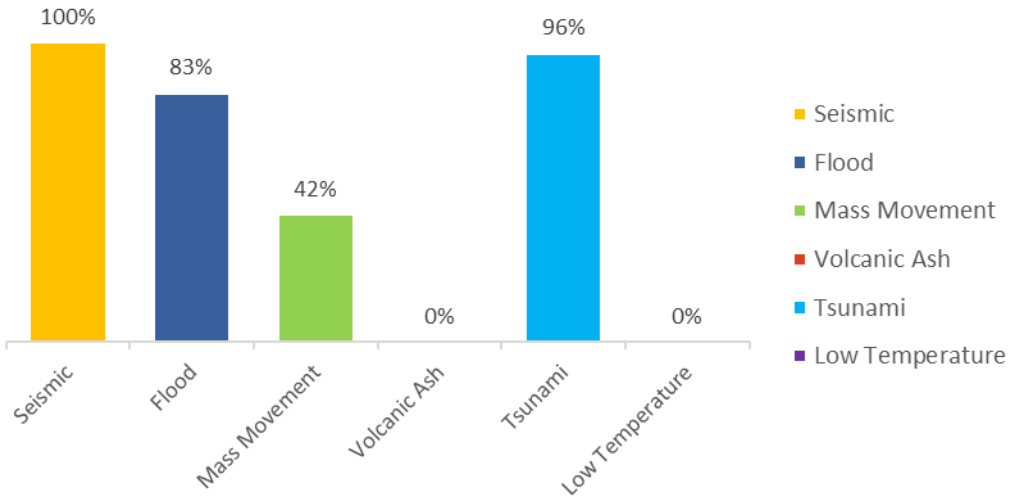


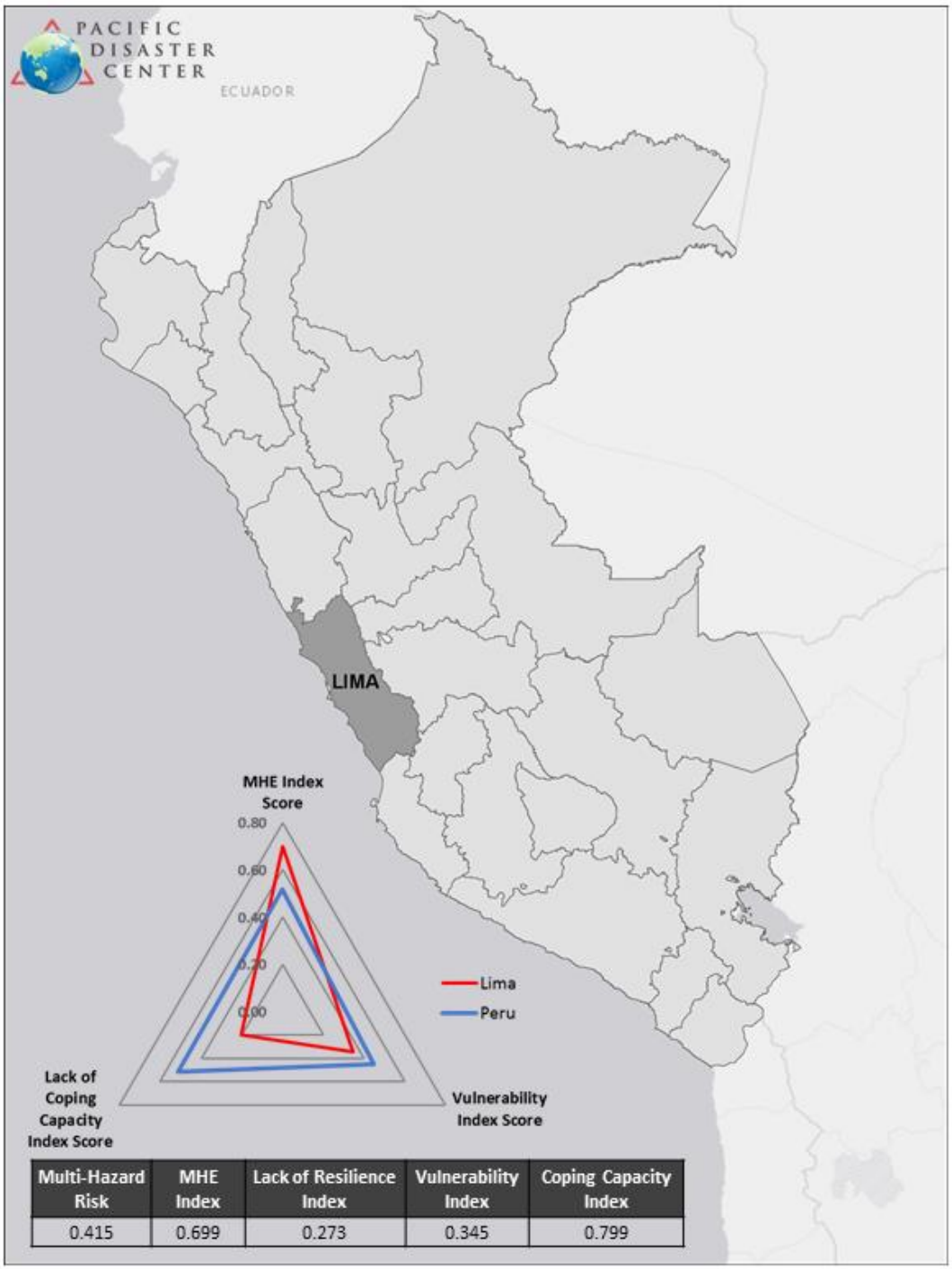
Figure 97. Percent population exposure to hazard type for Callao

Table 90. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Callao

Index	Callao	
	Score	**Rank**
Multi-Hazard Exposure	0. 691	8
Subcomponents		
Raw Exposure	0. 556	11
Relative Exposure	0. 827	4

Lima: Risk

Lima ranks **23 of 25** on the **Multi-Hazard Risk Index** with a score of **0.415**. Lima's score and ranking are due to high Multi-Hazard Exposure combined with very high Coping Capacity and very low Vulnerability scores. Lima has the 7th highest MHE in the country, the 23rd highest Vulnerability, and the 1st highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.415	0.699	0.273	0.345	0.799

Lima: Lack of Resilience

Lima ranks **25 of 25** on **Lack of Resilience Index** with a score of **0.273**. Lima's score and ranking are due to very low Vulnerability combined with very high Coping Capacity scores. Lima has the 23rd highest Vulnerability and the 1st highest Coping Capacity.

While Lima exhibits minimal Lack of Resilience overall, three thematic areas with weak relative scores for the region of Lima are: **Population Pressures, Environmental Capacity,** and **Environmental Stress.**

Table 91. Lack of Resilience Index and Component scores for Lima

Index	Lima	
	Score	**Rank**
Lack of Resilience	0.273	25
Components		
Vulnerability	0.345	23
Coping Capacity	0.799	1

Lima: Coping Capacity

Lima's coping capacity is **1st out of 25** with a score of **0.799**. Overall, Lima exhibits very high coping capacity in all thematic areas with one exception: **Environmental Capacity.** This thematic area may represent a constraint to Coping Capacity within this province.

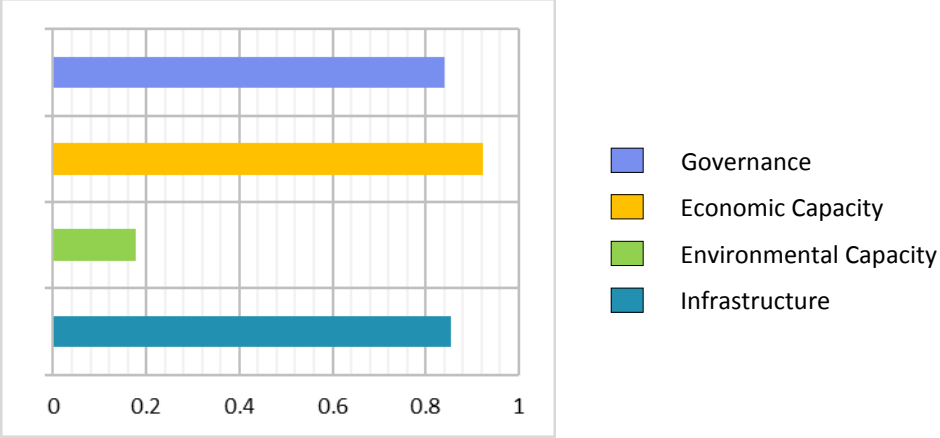


Figure 98. Coping Capacity subcomponents for Lima

Table 92. Coping Capacity Index, subcomponent and sub-index scores for Lima

Index	Lima	
	Score	**Rank**
Coping Capacity	0. 799	1
Subcomponents		
Governance	0. 840	1
Economic Capacity	0. 923	2
Environmental Capacity	0. 178	14
Infrastructure	0. 855	2
Infrastructure Sub-indices		
Health Care	0. 804	2
Transportation	0. 783	2
Communications	0. 978	1

Lima: Vulnerability

Lima ranks **23rd out of 25** on the Vulnerability Index with a score of **0.345.** Though Lima exhibits very low Vulnerability overall, the index is influenced by high **Population Pressures** and **Environmental Stress** subcomponent scores.

Table 93. Vulnerability Index and subcomponent index scores for Lima

Index	Lima	
	Score	**Rank**
Vulnerability	0. 345	23
Subcomponents		
Economic Constraints	0. 200	22
Info Access Vulnerability	0. 161	25
Vulnerable Health Status	0. 236	23
Clean Water Vulnerability	0. 042	25
Population Pressures	1. 000	2
Environmental Stress	0. 674	6
Recent Disaster Impacts	0. 047	24
Gender Inequality	0. 401	18

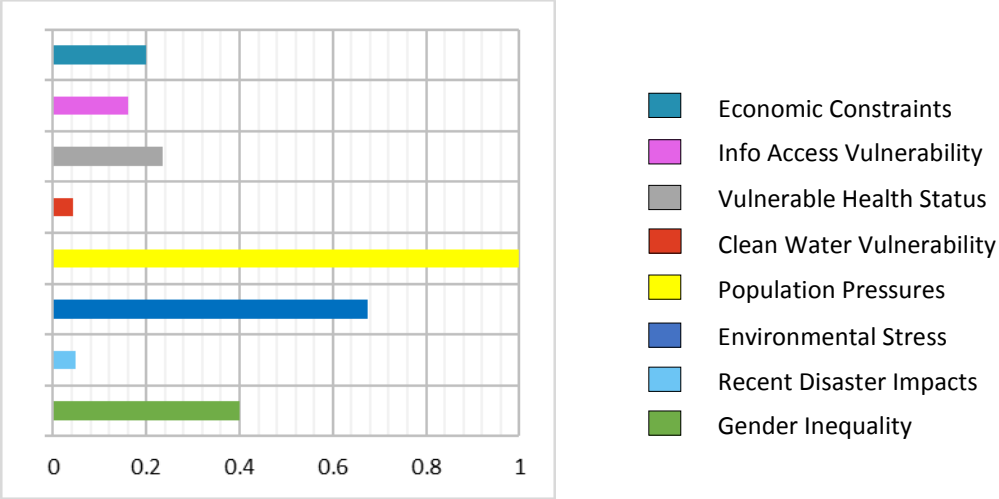


Figure 99. Vulnerability subcomponents for Lima

Lima: Multi-Hazard Exposure

Lima ranks **7th out of 25** on the MHE index with a score of **0.699**. The region has a very large population which is exposed to multiple hazards, including **seismic activity**, **mass movement, flood,** and **tsunami**. A small proportion of Lima's population is also exposed to low temperature.

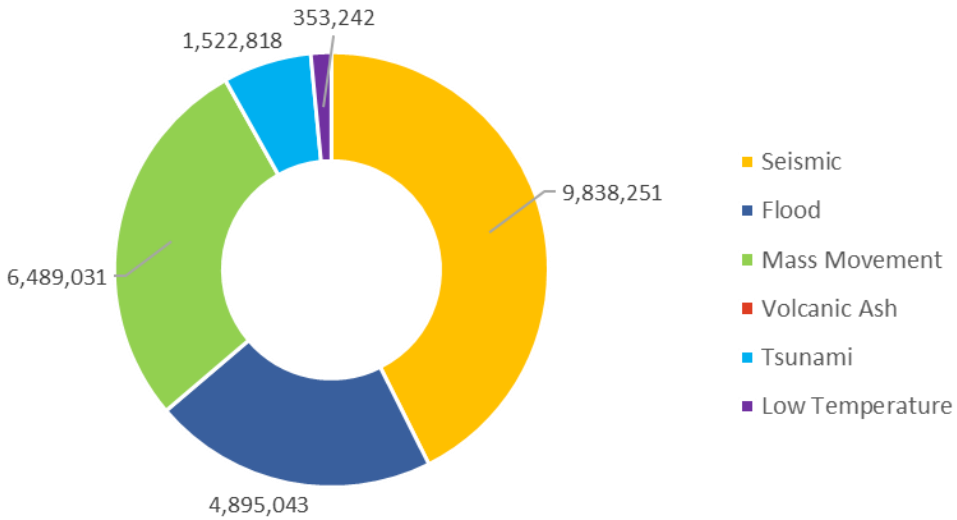


Figure 100. Raw population exposure by hazard type for Lima

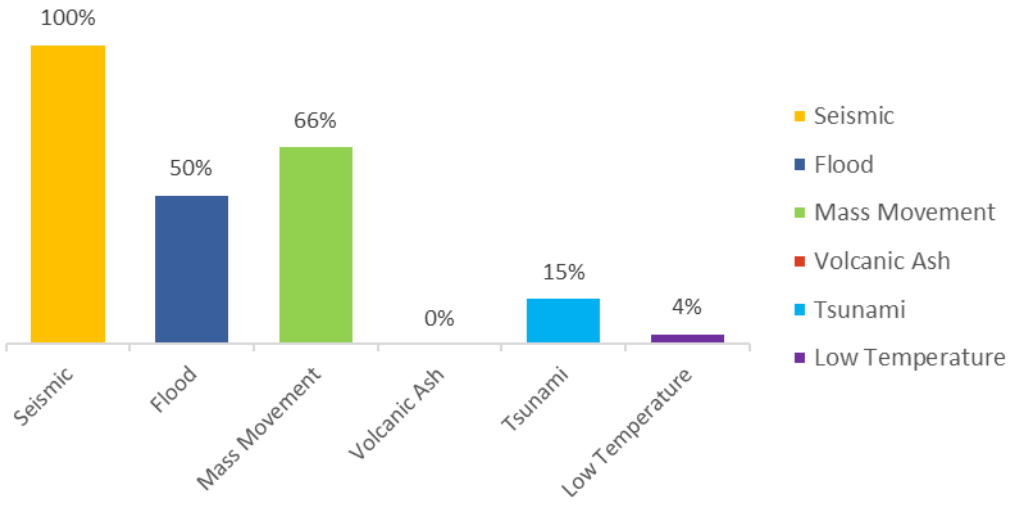


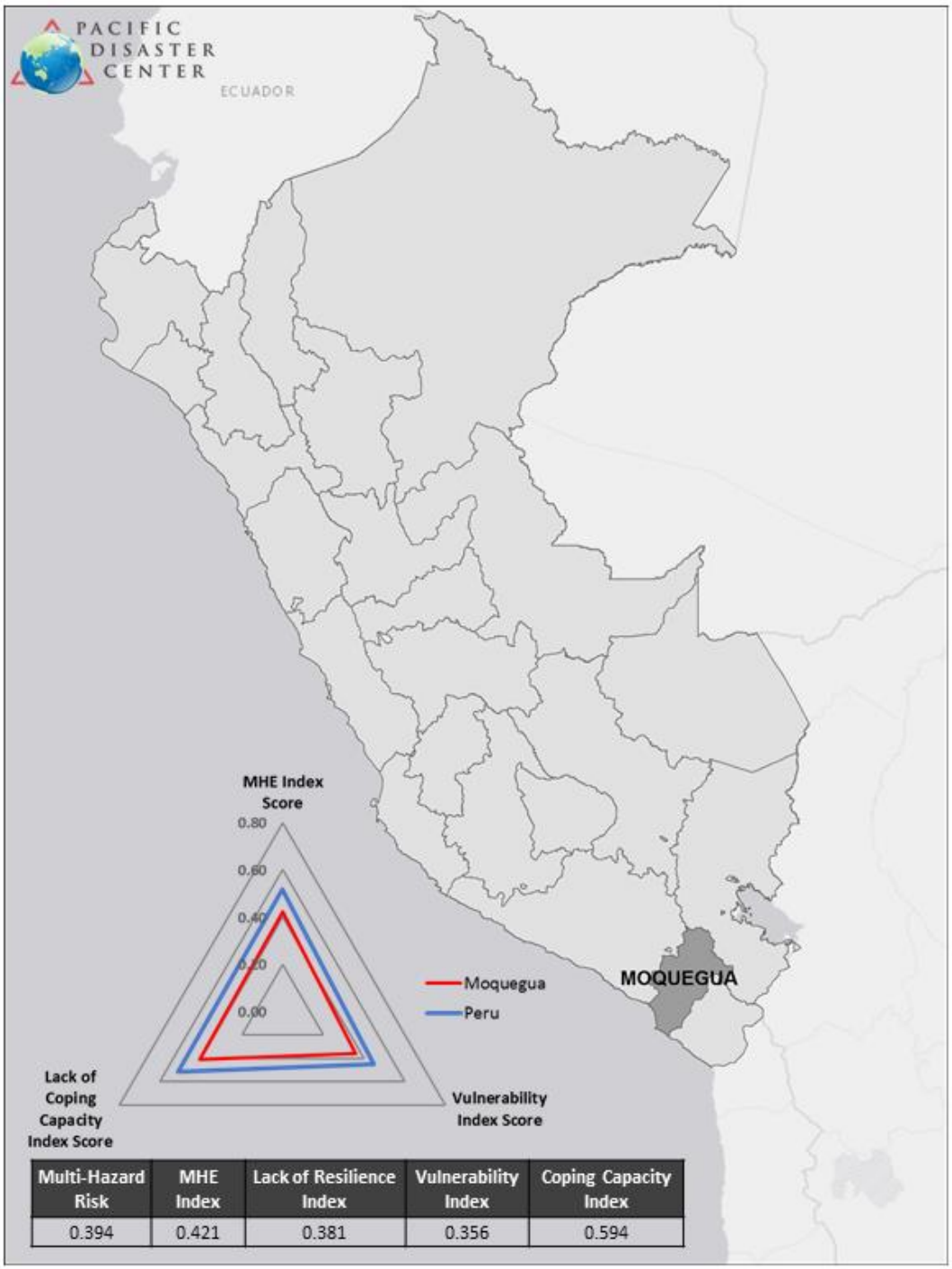
Figure 101. Percent population exposure to hazard type for Lima

Table 94. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Lima

Index	Lima	
	Score	**Rank**
Multi-Hazard Exposure	0. 699	7
Subcomponents		
Raw Exposure	1. 000	1
Relative Exposure	0. 399	21

Moquegua: Risk

Moquegua ranks **24 of 25** on the **Multi-Hazard Risk Index** with a score of **0.394**. Moquegua's score and ranking are due to low Multi-Hazard Exposure combined with very high Coping Capacity and low Vulnerability scores. Moquegua has the 16th highest MHE in the country, the 20th highest Vulnerability, and the 5th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.394	0.421	0.381	0.356	0.594

Moquegua: Lack of Resilience

Moquegua ranks **21 of 25** on the **Lack of Resilience Index** with a score of **0.381**. Moquegua's score and ranking are due to low Vulnerability combined with very high Coping Capacity scores. Moquegua has the 20th highest Vulnerability and the 5th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Moquegua are: **Recent Disaster Impacts**, **Environmental Capacity**, and **Governance.**

Table 95. Lack of Resilience Index and Component scores for Moquegua

Index	Moquegua	
	Score	**Rank**
Lack of Resilience	0.381	21
Components		
Vulnerability	0.356	20
Coping Capacity	0.594	5

Moquegua: Coping Capacity

Moquegua's coping capacity is **5th out of 25** with a score of **0.594**. While Moquegua's overall coping capacity in very high, the Index is influenced by weak relative scores for **Environmental Capacity** and **Governance**. These thematic areas may limit Coping Capacity within this region.

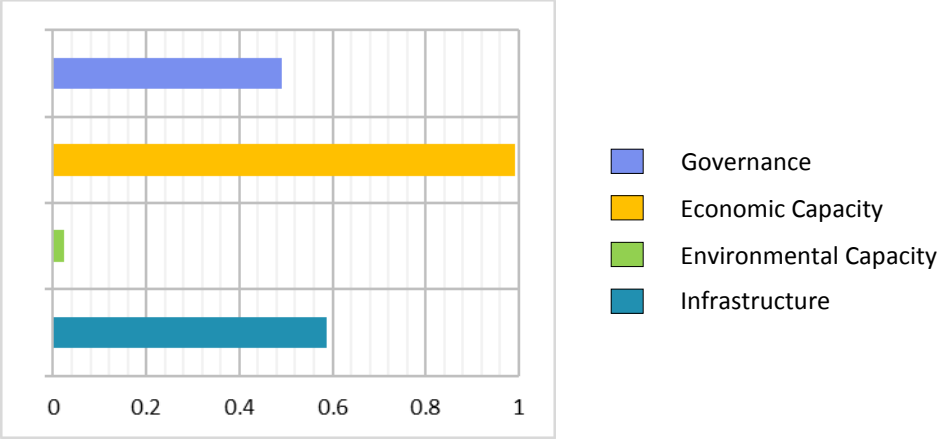


Figure 102. Coping Capacity subcomponents for Moquegua

Table 96. Coping Capacity Index, subcomponent and sub-index scores for Moquegua

Index	Moquegua	
	Score	Rank
Coping Capacity	0. 594	5
Subcomponents		
Governance	0. 492	19
Economic Capacity	0. 992	1
Environmental Capacity	0. 023	20
Infrastructure	0. 588	8
Infrastructure Sub-indices		
Health Care	0. 682	4
Transportation	0. 495	14
Communications	0. 588	12

Moquegua: Vulnerability

Moquegua ranks **20th out of 25** on the Vulnerability Index with a score of **0.356**. Though vulnerability in Moquegua is low, the Index is influenced by **Recent Disaster Impacts** and **Population Pressures** subcomponent scores.

Table 97. Vulnerability Index and subcomponent index scores for Moquegua

Index	Moquegua	
	Score	Rank
Vulnerability	0. 356	20
Subcomponents		
Economic Constraints	0. 079	24
Info Access Vulnerability	0. 239	20
Vulnerable Health Status	0. 395	18
Clean Water Vulnerability	0. 059	24
Population Pressures	0. 601	11
Environmental Stress	0. 379	13
Recent Disaster Impacts	0. 696	4
Gender Inequality	0. 400	19

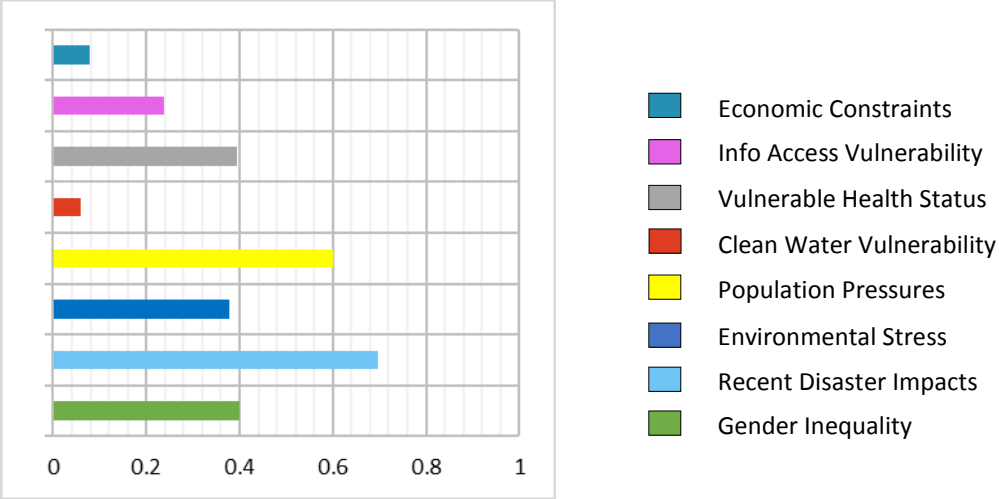


Figure 103. Vulnerability subcomponents for Moquegua

Moquegua: Multi-Hazard Exposure

Moquegua ranks **16th out of 25** on the MHE index with a score of **0.421**. A large proportion of the population is exposed to **seismic activity**, **mass movement, flood, tsunami,** and **volcanic ash.** A small proportion of Moquegua's population is also exposed to low temperature.

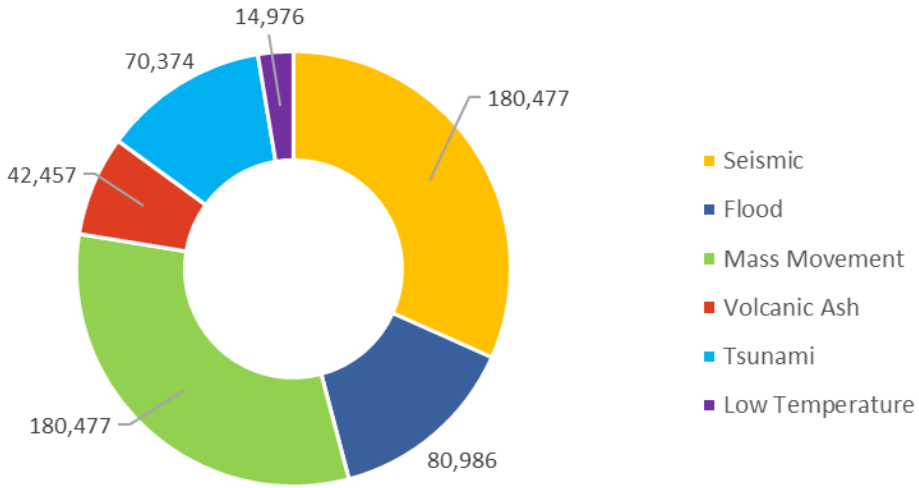


Figure 104. Raw population exposure by hazard type for Moquegua

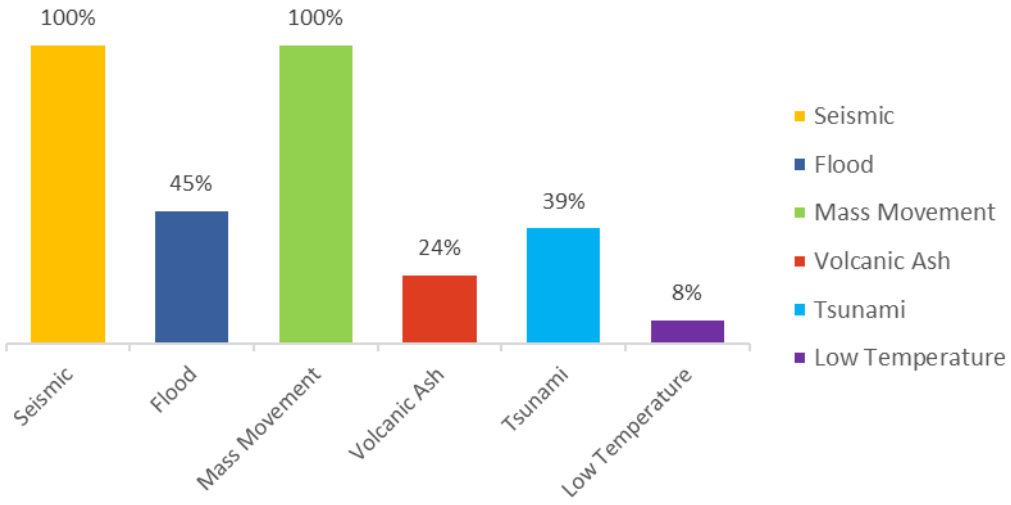


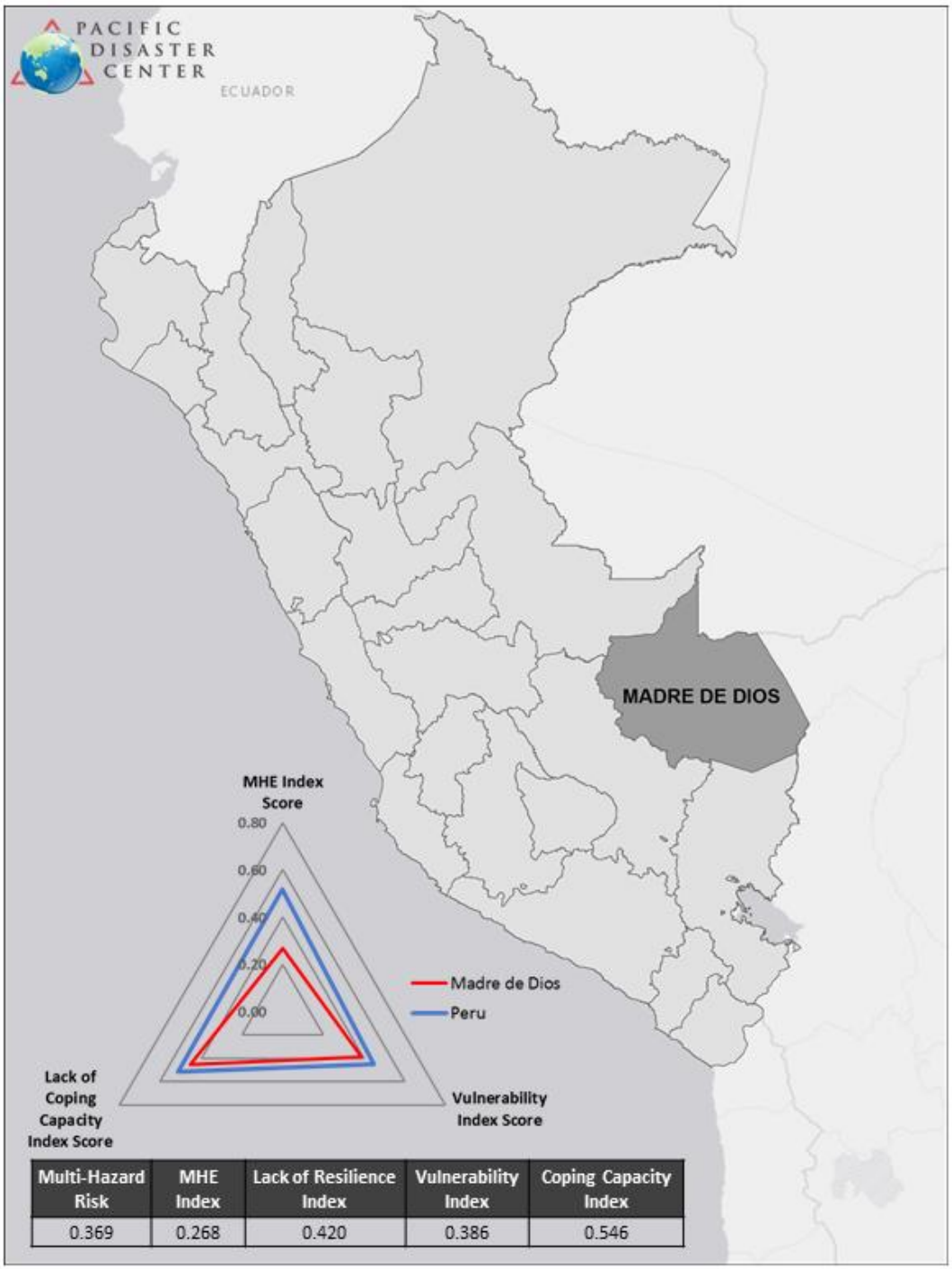
Figure 105. Percent population exposure to hazard type for Moquegua

Table 98. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Moquegua

Index	Moquegua	
	Score	**Rank**
Multi-Hazard Exposure	0. 421	16
Subcomponents		
Raw Exposure	0. 040	24
Relative Exposure	0. 802	6

Madre de Dios: Risk

Madre de Dios ranks **25 of 25** on the **Multi-Hazard Risk Index** with a score of **0.369**. Madre de Dios's score and ranking are due to very low Multi-Hazard Exposure combined with high Coping Capacity and low Vulnerability scores. Madre de Dios has the 21st highest MHE in the country, the 18th highest, Vulnerability and the 7th highest Coping Capacity.



Multi-Hazard Risk	MHE Index	Lack of Resilience Index	Vulnerability Index	Coping Capacity Index
0.369	0.268	0.420	0.386	0.546

Madre de Dios: Lack of Resilience

Madre de Dios ranks **20 of 25** on the **Lack of Resilience Index** with a score of **0.420**. Madre de Dios's score and ranking are due to low Vulnerability combined with high Coping Capacity scores. Madre de Dios has the 18th highest Vulnerability and the 7th highest Coping Capacity.

The three thematic areas with the weakest relative scores for the region of Madre de Dios are: **Population Pressures**, **Governance**, and **Transportation Infrastructure.**

Table 99. Lack of Resilience Index and Component scores for Madre de Dios

Index	Madre de Dios	
	Score	**Rank**
Lack of Resilience	0.420	20
Components		
Vulnerability	0.386	18
Coping Capacity	0.546	7

Madre de Dios: Coping Capacity

Madre de Dios's coping capacity is **7th out of 25** with a score of **0.546**. The thematic areas with the weakest relative scores are **Governance** and **Transportation Infrastructure**. These thematic areas appear to constrain Coping Capacity within this region.

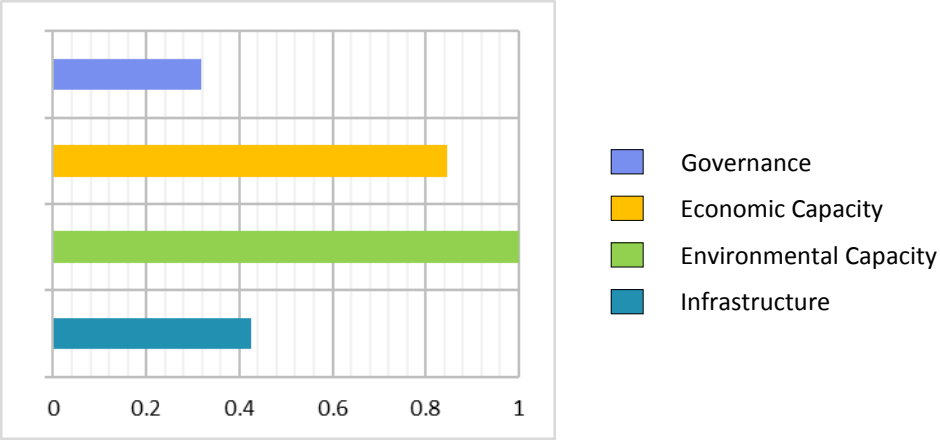


Figure 106. Coping Capacity subcomponents for Madre de Dios

Table 100. Coping Capacity Index, subcomponent and sub-index scores for Madre de Dios

Index	Madre de Dios	
	Score	Rank
Coping Capacity	0. 546	7
Subcomponents		
Governance	0. 319	23
Economic Capacity	0. 847	3
Environmental Capacity	1. 000	1
Infrastructure	0. 426	15
Infrastructure Sub-indices		
Health Care	0. 437	11
Transportation	0. 244	23
Communications	0. 597	10

Madre de Dios: Vulnerability

Madre de Dios ranks **18th out of 25** on the Vulnerability Index with a score of **0.386**. Vulnerability in Madre de Dios is strongly influenced by the **Population Pressures** subcomponent score.

Table 101. Vulnerability Index and subcomponent index scores for Madre de Dios

Index	Madre de Dios	
	Score	Rank
Vulnerability	0. 386	18
Subcomponents		
Economic Constraints	0. 038	25
Info Access Vulnerability	0. 357	18
Vulnerable Health Status	0. 536	8
Clean Water Vulnerability	0. 546	10
Population Pressures	1. 000	1
Environmental Stress	0. 000	25
Recent Disaster Impacts	0. 271	16
Gender Inequality	0. 344	21

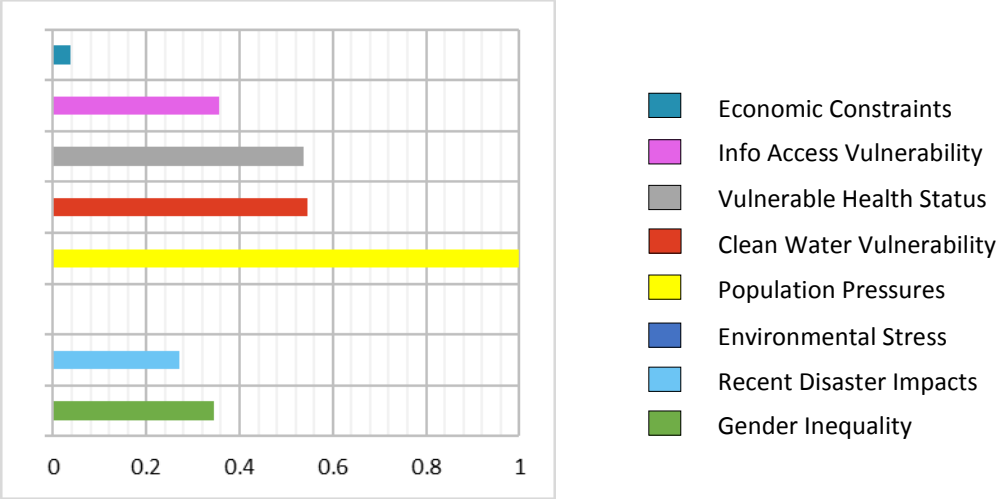


Figure 107. Vulnerability subcomponents for Madre de Dios

Madre de Dios: Multi-Hazard Exposure

Madre de Dios ranks **21st out of 25** on the MHE index with a score of **0.268**. Despite the low rank, a large proportion of the population is exposed to **low temperature**, **mass movement,** and **flood.**

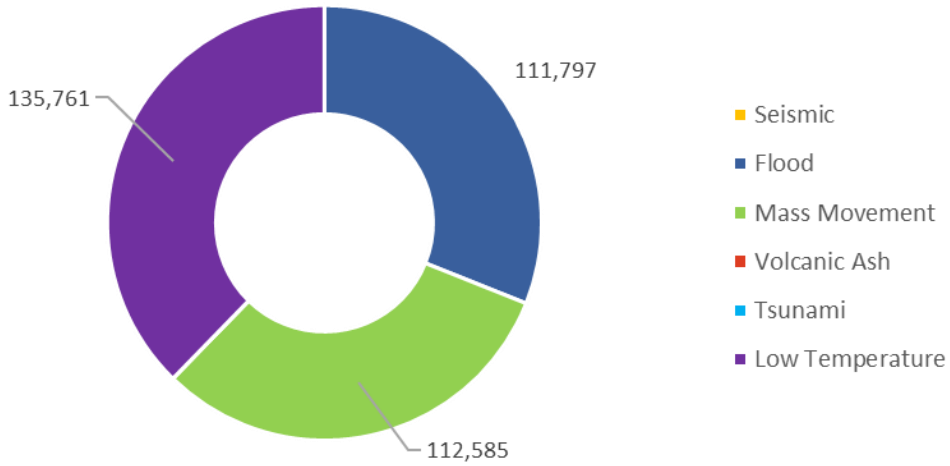


Figure 108. Raw population exposure by hazard type for Madre de Dios

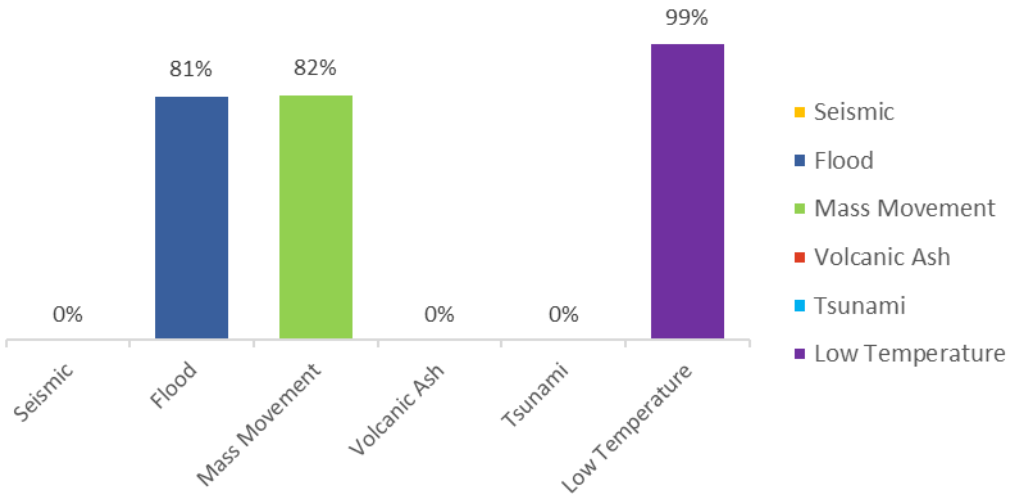


Figure 109. Percent population exposure to hazard type for Madre de Dios

Table 102. Multi-Hazard Exposure Index, Raw and Relative Exposure Index scores for Madre de Dios

Index	Madre de Dios	
	Score	**Rank**
Multi-Hazard Exposure	0. 268	21
Subcomponents		
Raw Exposure	0. 000	25
Relative Exposure	0. 536	19

RVA Recommendations

The following recommendations are based on the results of the Peru NDPBA RVA. These overarching recommendations are designed to acknowledge the complex drivers of risk that are prevalent throughout the country. As presented above, the specific drivers of risk can vary widely across regions. Consequently, to direct interventions that reduce vulnerability and increase coping capacity at the region level, decision-makers must carefully examine these drivers for each region.

Programmatic Recommendations to Support Risk and Vulnerability Assessments in Peru

1. Implement strategies to strengthen data sharing between all organizations active in disaster management to support evidence-based decision making.
2. Develop and adopt data standards to ensure that hazard and vulnerability data are consistently defined, documented, updated, and applied.
3. Strengthen strategic multi-stakeholder partnerships to expand disaster risk reduction resources to include non-traditional disaster management partners.

Strategies to Reduce Vulnerability and Increase Coping Capacity at the Region Level

1. Support efforts to reduce information access vulnerability by:
    a. Reducing disparities in access to quality education by implementing programs to increase school enrollment and equitable distribution of teaching resources.
    b. Acknowledging gaps in access to information mediums (ex. radio, television, internet) by distributing disaster information across multiple platforms and increasing investment for supply-side interventions that safeguard access to information in vulnerable communities.
2. Foster economic development and small business growth to create jobs, raise incomes, and stimulate local GDP, thereby reducing economic constraints and building capacity to prepare for, respond to, and recover from disasters.
3. Increase investment in public water and sewer infrastructure to reduce clean water vulnerability by promoting equitable access to sanitation and safe, clean drinking water.
4. Develop mutual-aid agreements to support the sharing of vital disaster management resources to increase coping capacity in less-equipped regions.
5. Develop SOPs to create comprehensive multi-hazard region plans for each phase of disaster management, and engage the public to understand and inform these plans to increase coping capacity by improving governance in the context of disaster management.

Comprehensive Disaster Management (CDM) Findings

PERU

NATIONAL DISASTER PREPAREDNESS BASELINE ASSESSMENT

PACIFIC DISASTER CENTER

Findings: Comprehensive Disaster Management

The CDM results presented in this section provide a summary of the CDM analysis, followed by a discussion of each CDM theme to include identified gaps and recommendations. Detailed recommendations for each CDM theme, along with a five-year implementation plan, have been designed to strengthen CDM in Peru.

The CDM helps to:

1. Provide a contextual overview of Peru's disaster management capabilities;
2. Identify the strengths and challenges of Peru's disaster management system; and
3. Provide context to the RVA results previously discussed by highlighting the larger DRR framework in Peru;

The CDM data gathering process included review of over 200 official documents, survey administration (Appendix C and D), detailed stakeholder interviews and site visits to critical facilities. Data were analyzed using a mixed-methods approach, with quantitative and qualitative information integrated into the overall findings and recommendations. This approach allowed for a more complete assessment of policy, critical stocks and facilities, and perceptions of disaster management in Peru.

Summary

Findings indicate that Peru has a well-structured disaster management system with robust training and exercise programs. The national disaster management law, SINAGERD, is comprehensive and concise. However, resource and budget limitations, as well as structural and process challenges, may hinder the country's capacity to meet its disaster management needs. Leadership is generally aware of shortfalls in the national disaster management system and partnerships have been established beyond the national level which promote a participatory and inclusive approach to Peru's disaster management processes.

Significant gaps identified in Peru's disaster management system include:

1. The lack of coordination and information sharing between INDECI and CENEPRED inhibits the overall effectiveness of Peru's disaster management system.
2. Training is limited in its geographic reach, primarily offered in urban areas. This creates a potential gap in access to training for disaster managers operating in rural communities.
3. MEF's budget allocations for disaster management are insufficient, presenting a significant challenge to the country's ability to promote directed investments for the SINAGERD system and increase Peru's hazard resilience.
4. Stakeholders indicate a lack of clearly defined roles and responsibilities for organizations active in disaster response, creating potential overlaps and duplication of effort.
5. Surveys and interviews highlighted concerns regarding the slow rate of recovery in the areas hardest hit by the 2007 Pisco earthquake – a source of frustration for many Peruvians, specifically in relation to building resilience against future hazard events.
6. The current COP does not promote inter-agency stakeholder coordination and collaboration in the event of a disaster, hindering effective disaster decision-making.
7. The current COEN does not adequately meet the disaster management needs of Peru, leaving gaps in Peru's ability to effectively respond in the event of a major disaster.

PDC captured this information and developed appropriate recommendations designed to meet CDM gaps in Peru. The following is an overview of CDM findings. Note that gaps, as well as their implications for the overall effectiveness of Peru's disaster management system, are outlined in detail. Individual recommendations are provided for each identified gap, with justification supplemented by stakeholder interviews and survey responses.

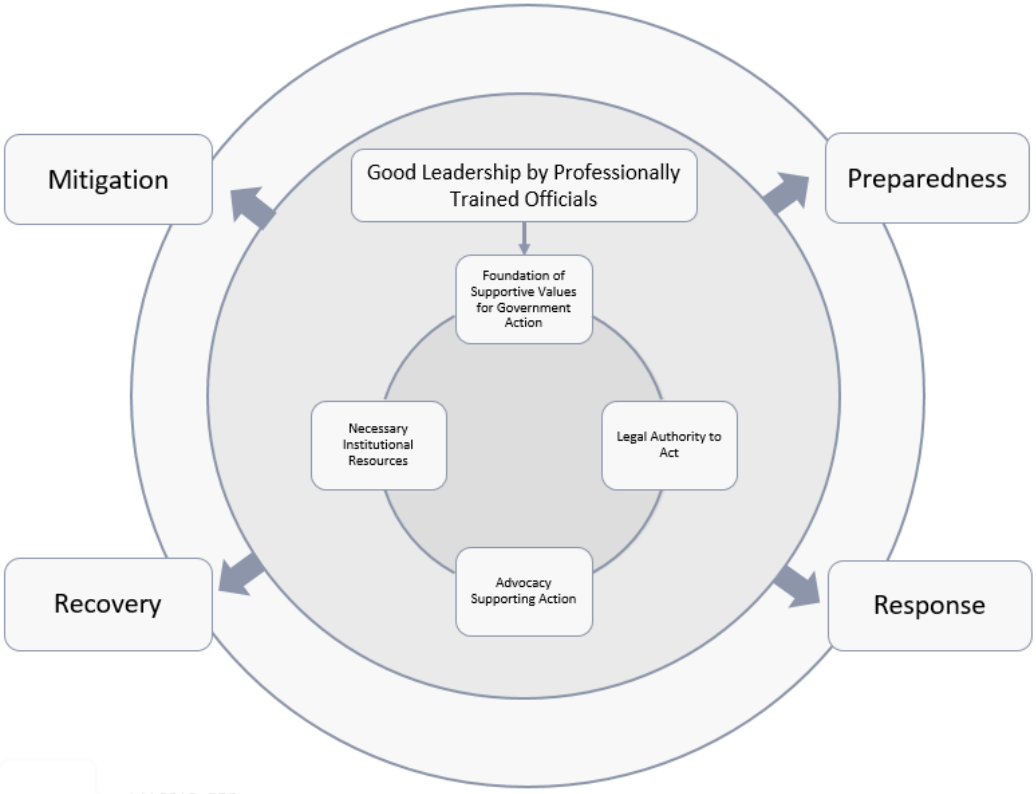


Figure 110. Comprehensive Disaster Management Model (Hughey, 2003).

Good Leadership by Professionally Trained Officials

The basis of successful disaster management centers upon the importance of well-trained professionals. A community or country that has established professionalization of the disaster management field through standardized training and education programs is ensuring a foundation of understanding and leadership among disaster management personnel at all levels.

Of those participants surveyed at the Midterm Knowledge Exchange, 73% indicated that their organizations exhibit strong disaster management leadership. However, interviews and additional stakeholder engagement frequently showed that coordination across organizations was limited. A clear example of this limitation was exhibited between INDECI and CENEPRED, the two key disaster management organizations in Peru. Interviews with representatives from both organizations frequently cited a need for closer coordination, information sharing, and integration of the applied sciences (CENEPRED) to disaster management practice (INDECI) to improve efficiency and better serve and protect communities.

INDECI's training program offers a variety of training courses across the country several times a year in close coordination with the Ministry of Education. An institutionalized national exercise program supports simulations (exercises/drills) twice a year, with additional exercises taking place annually at multiple government levels. The combination of training and simulations supports a rapid-ready team. Though 66% of survey participants indicated that their organizations have training programs to help develop and build

capacity in disaster management staff members, interviewees stated that frequent staff turnover limits the number of highly trained disaster management officials.

Findings: Exercise Frequency

Exercises are an integrated part of disaster management training in Peru. In surveys conducted with disaster management practitioners, 79% indicated that drills and exercises are conducted regularly to test plan effectiveness. COEN (Centro de Operaciones de Emergencia Nacional) and EDAN (Damage Assessment and Needs Analysis) workshops incorporate exercises into the training curriculum. National evacuation exercises are also conducted twice a year with the entire country participating simultaneously. These exercises are typically held in July and December. Additional minor exercises are carried out by INDECI pertaining to the flow of communication, fire suppression, and other single-focus disaster management functions.

Each administrative region across the country can arrange exercises at their discretion. However, it is mandatory that each region participates in the national level exercises. Regional, national, and multi-lateral simulations are also conducted annually, focused on el Niño, earthquakes and tsunamis, floods, forest fires, and frost. During 2015, specific exercises were scheduled by the Government of Peru's Ministerial Resolution 068-2015 to test an earthquake and tsunami scenario.

Findings: Training Programs

INDECI's DDIs (Directors de la Dirección Desconcentrada), as well as authorities of the regional, provincial, and district governments of Peru, can request training through INDECI's Directorate of Development and Human Capacity Building (INDECI-DEFOCAPH) or INDECI's internal intranet service. Despite the high availability of training, stakeholder interviews indicated a high rate of turnover among disaster management personnel. This frequent staff turnover has limited the number of professionals who have progressed past the basic level of training. Although more advanced training is offered by INDECI, few meet the minimum requirements (prerequisites) to attend the advanced courses. This has left Peru with a limited corps of highly-trained senior leaders. Among the disaster management practitioners surveyed, 66% indicated that their organizations have a training program to help develop and build capacity in disaster management staff members.

INDECI coordinates with the Ministry of Education, as well as international NGOs, to develop education plans and conduct training. In accordance with Peru's General Law of Education, and in line with its National Education Project (Ministry of Education, Peru - *Proyecto Educativo Nacional al 2021*), INDECI drafted a series of Community Education Plans. These plans aim to regulate training activities for authorities, officials, professionals, and technicians spanning all levels of government (INDECI - Educación Comunitaria 2015). Additionally, Law Nº 29664 established that public entities at all levels of government formulate, approve, and execute community education plans.

The 2015 Community Education Plan centered around a nationwide curriculum that included the following courses and workshops:

- Annual "Emergency Operations Center (COE)"
- Annual "Incident Command System"
- Annual "Damage Assessment and Needs Analysis (EDAN)"
- Annual "Early Warning System"
- Annual "Community Risk Map"
- Semi-annual "Learning to Prepare" and "Family Emergency Plans."

Two national academic programs are run through INDECI – PESPAD (Programa de Educacion Superior en Preparación y Atención De Desastres) and SESPAD (Programa Servicio Escolar Solidario para la Preparación y Atención de Desastres). INDECI coordinates an additional program that seeks to build resilience with the implementation of a Sustainable Cities Program (PCS – INDECI).

Findings: Training Frequency

INDECI is the central contact for disaster management training at the national and subnational levels. Stakeholder interviews with INDECI's training coordinators indicated the organization offers 38 different disaster management trainings semi-annually throughout multiple regions of Peru. However, training is primarily provided in areas with higher population density, potentially leaving disaster management practitioners in more rural communities with limited access to the necessary disaster management training.

Gaps

The following gaps were identified:

1. The lack of coordination and information sharing between INDECI and CENEPRED inhibits the overall effectiveness of Peru's disaster management system.
2. A high rate of staff turnover presents a significant challenge in terms of ensuring a sustainable cadre of well-trained, senior disaster management professionals in Peru. Continuous staff turnover will create a future gap in qualified leadership.
3. Training is limited in its geographic reach, primarily offered in urban areas. This creates a potential gap in access to training for disaster managers operating in rural communities.

Recommendations

It is recommended that Peru:

1. Expand and institutionalize cooperation and coordination between INDECI and CENEPRED that fosters information sharing between organizational leadership and staff members. This will result in a unified approach to efficiently communicate requirements and capabilities to all elements of Peru's disaster management structure.
2. Take steps to build a better understanding of the drivers of staff turnover (political, financial, etc.) and establish a plan to support, encourage, and maintain senior leadership in disaster management.
3. Expand technical capability to extend the reach of disaster management training via online and web-based training curriculum.

Foundation of Supportive Values for Government Action

More than good leadership by well-trained professionals is required for effective and efficient disaster management. A foundation of supportive values for government action is an essential component, which enables concepts to be developed into policies and provides government leaders the backing to spend money in an effort to build resources. This is critical for communities and countries with a limited economic base. Disaster preparedness is only one of many issues a government may face. Government support must be encouraged to ensure that the proper importance is placed on disaster management mitigation and preparedness in an effort to build disaster resilient communities with a focus on saving lives and reducing losses.

The National System for Disaster Risk Management in Peru (SINAGERD) is an inter-institutional, decentralized system established for the purpose of disaster risk reduction in Peru (see Figure 111). Law Nº 29664 (SINAGERD) employs the organizing principle of subsidiarity which dictates that disasters be handled at the lowest level possible. This push for a decentralized disaster management system allows for national-level disaster intervention only when the capacities at the local or regional-level are exceeded. Subsidiarity is currently being institutionalized by the Government of Peru (refer to Figure 112 in "Advocacy Supporting Action" below).

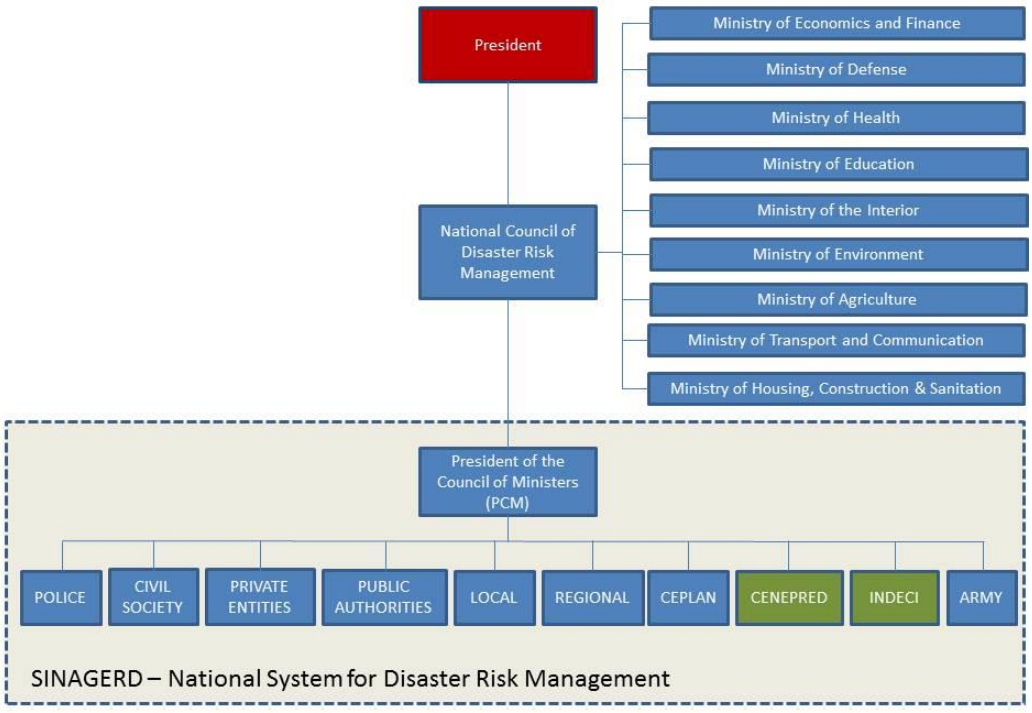


Figure 111. SINAGERD - Peru's national disaster management system.

The perception of survey respondents was that a lack of adequate financial resources serves as one of the greatest challenges to effective disaster response in Peru. Survey participants further indicated an awareness that their organizations could improve disaster management by dedicating more financial resources to meet the country's needs. In addition, each institution within the SINAGERD system has

appointed disaster management positions, providing a solid foundation from which to strengthen its disaster management capacity and capabilities. Peru has also ensured an annual disaster management budget and Contingency Reserve Fund illustrating a commitment to DRR.

Findings: Annual Budget

The Ministerio de Economia y Finanzas (MEF) is responsible for the identification and assessment of adequate and cost-effective mechanisms that allow Peru to have the financial capacity required for major disasters and their respective reconstruction costs. MEF specifically designed aspects of the country's financial management strategy to incorporate elements of the 2011 *Gestión del Riesgo de Desastres* (GRD) policy in place under SINAGERD, including budget programs for both vulnerability reduction and emergency response. This facilitated the allocation of budget projects and activities related to disaster risk management. Based on stakeholder interviews and surveys, there is a perception that MEF's budget allocations are insufficient to meet disaster management needs in Peru.

The Municipal Modernization Incentives Program, operated jointly by MEF and the Ministerio de Vivienda, Construcción y Saneamiento (MVCS) since 2011, includes financial incentives for local governments that perform DRR tasks in their jurisdictions. MEF allocates GRD tasks to local governments on an annual basis, with the goal being for local governments to meet the deadlines associated with these tasks. Additional funds for the development and implementation of GRD projects in support of local governments can be accessed through *El Fondo de Promoción a la Inversión Pública Regional y Local* (FONIPREL) and *El Fondo para la Inclusión Económica en Zonas Rurales* (FONIE) funds.

INDECI's Institutional Operational Plan (POI) provides guidance for operational activities for fiscal year 2015. These activities coincide with the objectives and strategic goals established in the Institutional Strategic Plan 2015-2021, and are linked with the institutional budget, illustrating a commitment to long-term disaster management sustainability.

The General Office of Planning and Budget is responsible for the coordination and consolidation of all operational activities. Law Nº 30281 on the Public-Sector Budget for Fiscal Year 2015 allocated INDECI an initial operating budget of S /. 72,997,026.00 (US $22,818,445.00). The distribution of these funds for the implementation of the 2015 Operational Plan extended to institutional bodies, organizational units, and decentralized bodies as follows:

- Budget Programs: S /. 57,160,965.00 (US $17,868,184.00), or 78% of the operating budget.
- Budget Programs (without Products): S /. 3,125,632.00 (US $956,582.33). These programs include:
    - Pension Obligations: S /. 449,250.00 (US $140,432.00).
    - Directly-Collected Resources S /. 2,676,382.00 (US $836,621.43).
- Central Actions: S /. 12,710,429.00 ($US 3,889,956.25).
    - Funding for central actions, 17% of the operating budget, corresponds directly to the Administrative Organizational Units.

Findings: National Disaster Fund

The second provision of the Law of Financial Balance of the Public-Sector Budget for Fiscal Year 2013 allocated S /. 50,000,000.00 (US $15,629,708.00) for a Contingency Reserve Fund, or disaster reserve funds. Standard procedure grants the Government of Peru direct control of the Contingency Reserve resources for emergency activities and Public Investment Projects (PIP). When a State of Emergency is

declared, budgetary resources from the Contingency Reserve become available as a means of support for the country at both the national and subnational level.

The Contingency Reserve funds are used for the rehabilitation of public infrastructure damaged by natural phenomena, human action, and situations of imminent danger. A livestock care component is included, contingent upon the livestock being located 3,000 meters above sea level. Interviews with stakeholders showed that considerable progress has been made to reduce the time required to release funds from the Contingency Reserve. This progress ensures timely delivery of services to impacted populations in times of disaster. Control and monitoring of the Contingency Reserve is completed by the Rehabilitation Directorate of INDECI (DIREH). While the Contingency Reserve Fund has had a surplus each year since its provision, Peru has not experienced a major disaster since the 2007 Pisco earthquake. As noted by interviewees, it remains to be seen if this fund will be sufficient for major events.

Findings: Appointed/Cabinet-Level Position

SINAGERD's scope is applicable to all institutions and levels of government across Peru (see Figure 111 above). Under SINAGERD, INDECI is the executing agency for all phases of disaster management. INDECI works towards the coordination and implementation of all actions of civil defense in accordance with Peru's national disaster plans and policies, with primary responsibility for ensuring the safety and security of the citizens of Peru.

INDECI reports directly to the Presidency of the Council of Ministers (PCM) which then refers INDECI's reports directly to the National Council of Disaster Risk Management (CONAGERD) – the highest level of ministerial group responsible for monitoring the implementation of national disaster plans and policies in Peru.

Gaps

The following gaps were identified:

1. MEF's budget allocations for disaster management are insufficient, presenting a significant challenge to the country's ability to promote directed investments for the SINAGERD system and increase Peru's hazard resilience.

Recommendations

It is recommended that Peru:

1. Explore alternative funding sources to increase the availability of dedicated disaster management funds within the national budget to ensure that DRR efforts align with national priorities.

Legal Authority to Act

Legal Authority to Act provides the necessary foundation for implementation of CDM. The legal framework within which disaster operations occur can have a significant impact on preparedness, response, recovery, and mitigation. Without the authority to act and the support of government officials, CDM activities can be halted, leaving residents vulnerable to disasters.

Disaster management in Peru operates on a firm legal authority under Law Nº 29664 which established the country's national policy for disaster risk management, *El Sistema Nacional de Gestión del Riesgo de Desastres* (SINAGERD). Supplemented by Supreme Decree Nº 048-2011-PCM, SINAGERD outlines the regulations, budget appropriations, and institutional framework for disaster risk management in Peru. A decentralized and participatory approach is provided, yet has not been fully implemented due to both the complex geography of Peru and the high rate of local staff turnover in key disaster management organizations.

Title II of Supreme Decree Nº 048-2011-PCM established SINAGERD's *National Policy for Disaster Risk Management*. This policy acknowledges that disaster management is a continuous process and that the incorporation of its stated principles must be driven by policy, involve universal participation, and thus include the necessary mechanisms and guidance for implementation. The policy defines disaster risk management and emphasizes its applicability to all levels of government, the private sector, and the citizens of Peru.

Peru's disaster management system is firmly supported by official legislation, with disaster management roles and responsibilities clearly defined for stakeholders at each administrative level of the country. Documentation and SOPs exist to guide the disaster management process. These documents are publicly available and appear to be evaluated and updated on a regular basis.

Findings: Disaster Management Legislation

Since the signing of Law Nº 29664, a progression of key disaster management legislation has been established and implemented in Peru. A summary of these legislative additions can be viewed in Table 173 contained in *Appendix E: Key SINAGERD Disaster Management Legislation*.

At the national level, established disaster management plans include INDECI's *National Emergency Plan* (2007) and CENEPRED's *Institutional Operations Plan* (2012). At the regional level, each region maintains an Institutional Strategy Plan (PEI).

Findings: Designated Authorities

The SINAGERD system outlines stakeholder roles and responsibilities for disaster management at all administrative levels in Peru. However, according to survey results, 45% of respondents felt disaster response tasks are not clearly defined for the country. Furthermore, 61% indicated that overlap of responsibilities exists between organizations active in disaster response, creating potential duplication of effort. These results suggest that additional clarity is needed to ensure effective service delivery. Roles and responsibilities designated by SINAGERD must be socialized among organizations active in disaster response to ensure that they are widely understood and applied.

Under the Office of the President, the National Council of Disaster Risk Management (CONAGERD) is the highest Ministerial group responsible for strategic coordination, as well as for monitoring the implementation of national disaster plans and policies in Peru, particularly the *National Plan for Disaster Risk Management*. CONAGERD can be convened by the Presidency of the Council of Ministers (PCM) and is comprised of the following:

- The President of the Republic of Peru – CONAGERD Chair;
- The Presidency of the Council of Ministers (PCM);
- The Ministry of Economy and Finance;

- The Ministry of Defense;
- The Ministry of Health;
- The Ministry of Education;
- The Ministry of the Interior;
- The Ministry of Environment; and
- The Ministry of Agriculture.

Along with the authority to convene CONAGERD, the PCM also ensures compliance, integration, and coordination under the SINAGERD system, including public, private, and community efforts.

As previously discussed, Peru has two primary disaster management agencies: INDECI and CENEPRED. INDECI holds nationwide jurisdiction and maintains regional representation through 25 decentralized offices. Headed by directors (DDIs) who represent the head of INDECI, these offices engage with regional and local governments across the country.

By law, INDECI serves to coordinate and implement disaster plans and policies at all levels of government, with primary responsibility for ensuring the safety and security of the citizens of Peru. INDECI controls all actions of civil defense through the National Civil Defense System (SINADECI) in agreement with Peru's national plans and policies. Under SINADECI, INDECI steps in when the response capabilities of the regional system of civil defense (SIRADECI), are exceeded. INDECI further supports and facilitates the Centro de Operaciones de Emergencia Nacional (COEN).

INDECI manages regional and local-level government infrastructure, equipment allotment, procurement, and the training of human resources for the efficient operationalization of all Peru's EOCs. INDECI is further responsible for the management of, updates and improvements to the *Sistema de Informacion Nacional para la Respuesta y Rehabilitacion* (SINPAD), Peru's national incident management system.

Under SINAGERD, CENEPRED serves as a technical organization which provides assistance at the regional, provincial, and district levels. CENEPRED is managed by the PCM and is tasked with coordinating, facilitating, and monitoring both the National Policy of Disaster Risk Management and the National Plan of Disaster Risk Management. CENEPRED works closely with the National Center for Strategic Planning (CEPLAN) to ensure that disaster risk management methodologies are incorporated into the National Development Plan. CENEPRED is additionally responsible for reconstruction activities and coordinates with the Ministry of Education, the National Assembly of University Chancellors, and other relevant stakeholders to generate prevention strategies for Peru to avoid future risks.

The Multisectorial Committee for Disaster Prevention and Response (CMPAD) is a commission with responsibility for coordinating, assessing, prioritizing, and monitoring damage prevention, care, and rehabilitation in areas of the country threatened or affected by large-magnitude disasters.

Disaster management responsibilities are incorporated into many of Peru's ministries. At the subnational level, Peru is divided into regions, provinces, and districts. Disaster management at each of these levels consists of an interconnected set of communities dedicated to civil defense and population protection. Following a disaster, the initial disaster response stems from community-based resources, including first responders and public participation. If a disaster exceeds the capabilities of the local level, response support advances to the provincial or regional level, depending on the scope of the disaster.

At the regional level, disaster management is conducted by Regional Civil Defense Committees which report to INDECI. At the provincial level, disaster management is conducted by Provincial Civil Defense Committees, and at the district and village or annex levels, it is conducted by Civil Defense Committees. These local platforms consist of Emergency Operations Centers (COEL) which are operated by members of the working groups who provide direct disaster assistance to affected populations.

Findings: Disaster Management Documentation Availability

Sixty-five percent (65%) of survey respondents have access to copies of their organization's disaster management plans. The inter-agency sharing of plans is not universal with only 48% reporting their disaster plans have been shared with other agencies or organizations active in disaster management.

Disaster management plans are publicly available on INDECI's website for national, sectoral, regional, and provincial levels, along with a limited number of local plans. These include strategic plans, emergency operational plans, evacuation plans, and contingency plans.

Findings: Documentation/SOP Update Frequency

Stakeholder interviews confirmed that disaster management plans and policies are regularly evaluated. Seventy-nine percent (79%) of survey respondents reported that their organization's plans are tested regularly (drills/exercises). Sixty-one percent (61%) also reported that their organization's plans are regularly updated. However, there is no explicit requirement for scheduled review and update of plans and SOPs.

Gaps

The following gaps were identified:

1. Stakeholders indicate a lack of clearly defined roles and responsibilities for organizations active in disaster response, creating potential overlaps and duplication of effort.
2. The lack of availability of local level plans presents a subnational disaster management challenge for Peru.
3. At present, there is no requirement for agencies to regularly update plans or SOP documentation.
4. The full implementation of SINAGERD at the regional level appears to be incomplete, inhibiting the decentralization of Peru's disaster management structure, as well as the full participation of stakeholders at the regional level.

Recommendations

It is recommended that Peru:

1. Within SINAGERD, establish clear designation of roles and responsibilities for organizations active in disaster response. Socialize and conduct training to ensure that these roles are widely understood and applied.
2. Increase the public availability of local plans, both online and in printed form, in order to strengthen subnational disaster management capacity and capabilities.
3. Establish a more formalized timeline for updates to disaster response plans and SOPs to ensure that lessons learned are integrated on a regular basis. This will allow leadership the opportunity

to ensure that advances in the field of disaster management and DRR are reflected in all policies and procedures.

4. Prioritize the full implementation of SINAGERD at the regional level to enhance decentralization, stakeholder participation, coordination, and collaboration for disaster management initiatives across the country.

Advocacy Supporting Action

Advocacy supporting action is necessary to ensure that disaster management policies are implemented throughout a country. The backing of political leaders is not always enough to ensure that hazard policies are implemented. Successful disaster management requires strong stakeholder support across all levels. Following a disaster, stakeholder support for action is generally high and may play a key role in hazard policy implementation. Stakeholders include traditional and non-traditional partners involving the general public, non-governmental organizations, academic institutions, the private sector, and those providing assistance before, during and after a disaster.

Stakeholder interviews and surveys showed that significant levels of non-governmental support exist for disaster management activities in Peru. However, challenges were evident in regards to Peru's ability to efficiently recover from major disaster events, as well as the country's ability to fully implement disaster management at the regional level.

Findings: Recent Disaster Events

Peru's most recent large-scale disaster was an 8.0 magnitude earthquake which occurred in Pisco in 2007. The earthquake claimed more than 500 lives, and the effects of the disaster remain visible as rehabilitation and recovery efforts continue.

Survey results highlighted stakeholder perception on the effectiveness of recent disaster response events in Peru. Sixty-one percent (61%) of participants indicated that their organizations responded to the last major disaster. Almost half of respondents felt the national response to the last major disaster (Pisco Earthquake) and the mobilization of resources and response personnel was ineffective. Perceptions of the ineffective response are detailed in the following support functions:

- Forty-seven percent (47%) felt evacuations were executed ineffectively
- Forty-seven percent (47%) also indicated sheltering was ineffective
- Forty-five percent (45%) felt that emergency medical response efforts were ineffective
- Twenty-four percent (24%) indicated that search and rescue agencies responded ineffectively
- Fifty-eight percent (58%) felt disaster information messages were issued ineffectively

Commonly cited reasons for ineffective response included inadequate resources (including material, financial, and human), poor communication, and inadequate coordination. Responses also referenced a greater need for trainings and capacity building. Furthermore, though 90% of stakeholders indicated the high-value of damage and needs assessments to facilitate response decision making, 45% felt that the assessments conducted after the last major disaster were inaccurate.

Interviewees frequently voiced frustration with the slow rate of recovery following the Pisco earthquake. Seven years post-event, debris removal and demolition of damaged structures are not complete in communities hit hardest by the disaster.

Findings: Disaster Declarations

According to official interviews with INDECI's Oficina General de Asesoría Jurídica, a total of 53 Disaster Declarations were put into effect across various regions of Peru in 2013. For Level 1 to Level 3 emergencies[1], Regional EOCs (COERs) can implement disaster declarations. The National EOC implements disaster declarations for Levels 4 and 5 (see Figure 112). Additionally, emergency alerts are categorized by severity: green, yellow, orange, and red.

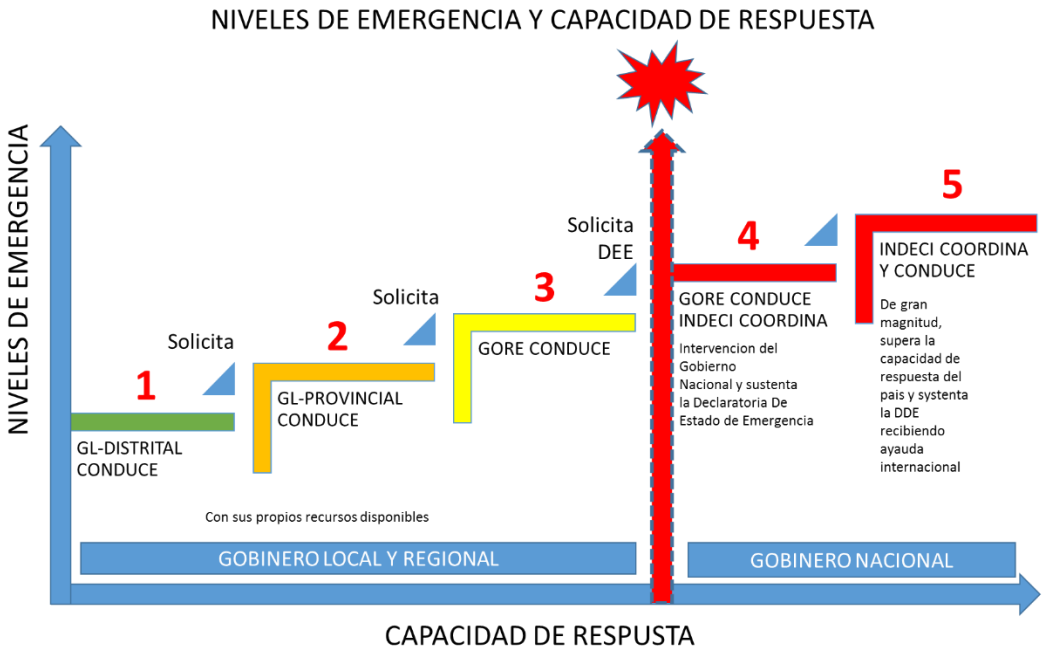


Figure 112. The principle of subsidiarity as demonstrated by the levels of disaster response in Peru.

The declaration of a state of emergency for imminent danger or a disaster is issued under the following regulations:

- Peruvian Constitution 1993: Article 137;
- Law Nº 29664 (SINAGERD);
- Supreme Decree Nº 048-2011-PCM; and
- Supreme Decree Nº 074-2014-PCM.

[1] In Peru, the level of emergency is based on the response capability of each administrative level, once the response capability of a district, provincial, or regional EOC is exceeded, the emergency level increases.
Level 1 Emergency: District Government coordinates response
Level 2 Emergency: Provincial Government coordinates response
Level 3 Emergency: Regional Government coordinates response
Level 4 Emergency: INDECI coordinates response
Level 5 Emergency: INDECI coordinates response and requests international assistance

Findings: Recent Disaster Legislation

A continual progression of disaster management legislation has been passed since the establishment of the SINAGERD framework in 2011. Peru's most recent disaster legislation – the *Plan Nacional de Gestión del Riesgo de Desastres (PLANAGERD) 2014-2021* – was passed in 2014. Recent disaster legislation indicates lawmakers are actively supporting disaster management and DRR initiatives.

Findings: Political Approval Ratings

Interviews with key stakeholders at the Instituto Nacional de Estadistica e Informatica (INEI) provided political approval ratings for the year 2013. Per available information, statistics generally show high approval ratings, which indicate public support for government initiatives, including recent disaster management legislation.

Findings: Agencies with a Disaster Focus Active in the Country

It is important to consider all partners active in disaster management, including non-traditional partners, in order to fully assess the level of stakeholder support in Peru. Survey responses indicated that a diverse group of stakeholders are engaged in disaster management activities in the country. Thirty-four percent (34%) of survey respondents indicated their organizations engage with the military to support disaster response, while 50% reported their organizations engage with the private sector to advance DRR initiatives.

NGOs also serve as key partners often providing support in areas where need is the greatest. Working at both the national and local government levels, NGOs are important partners in establishing policies and advancing DRR activities. Data provided by *Red de Información Humanitaria para América Latina y el Caribe* (REDHUM) detailed 16 NGOs which maintain an active disaster management focus in Peru. These organizations have extensive experience with disaster management in Peru, and each is assigned to a disaster management phase and UN cluster[2] for operations. Key NGOs active in disaster management in Peru include:

- ASPEm
- CARE Perú
- COOPI
- Cruz Roja Peruana
- Fundacion Contra el Hambre
- OIM
- OPS
- Oxfam International
- Plan International
- PMA
- PNUD
- Save the Children
- Soluciones Prácticas
- UNESCO
- UNICEF

[2] Based on the UN Cluster Approach

- WeltHungerHilfe

When Peru's national response capacity is exceeded, international assistance can be requested by the Peruvian government. The following agencies have partnered with Peru in the past to provide additional response capabilities during significant disaster events:

- Andean Committee for Disaster Prevention and Response (CAPRADE)
- Corporación Andina de Fomento (CAF);
- Delegation of the European Commission (EU);
- Department of Humanitarian Aid and Civil Protection - European Commission (DIPECHO);
- Food and Agriculture Organization of the United Nations (FAO);
- France Technical Cooperation Service;
- Germany Project Management Services (GTZ);
- International Red Cross and Red Crescent Federation (IFRC);
- International Strategy of the United Nations for the Reduction of Disasters (UNISDR); and
- Japan International Cooperation Agency (JICA);
- Pan American Health Organization (PAHO);
- Spanish Agency for International Cooperation (AECID);
- Switzerland Agency for Development and Cooperation (SDC);
- United Nations Children Fund (UNICEF);
- United Nations Office for the Coordination of Humanitarian Affairs (OCHA);
- United States Agency for International Development (USAID) / Office of Foreign Disaster Assistance (OFDA);
- United States Southern Command (Humanitarian Assistance Program-HAP) (USSOUTHCOM);
- World Food Program (WFP);
- World Health Organization (WHO);

Gaps

Based on the findings above, the following gaps were identified:

1. Surveys and interviews highlighted concerns regarding the slow rate of recovery in the areas hardest hit by the 2007 Pisco earthquake – a source of frustration for many Peruvians, specifically in relation to building resilience against future hazard events.

Recommendations

The following recommendations are based on the gaps identified above. It is recommended that Peru:

1. Prioritize the continued rehabilitation of the areas hardest hit by Pisco's 2007 earthquake to increase resilience against future disasters, and review legislation and plans to streamline the recovery process following major disasters in Peru.

Necessary Institutional Resources

It is critical that every jurisdiction has an accurate assessment of available resources (human and material), and is familiar with their availability during disaster. Although many areas have a limited economic base and few immediate resources, through mutual-aid agreements with neighboring jurisdictions, resources can be easily mobilized to respond. Being able to quickly assess the community needs and having the knowledge of resource availability, aid can be requested in a timely manner to ensure immediate emergency needs are met.

Survey responses and interviews with key CDM stakeholders validated assessment findings which suggest that Peru has significant resource gaps (material, human, and financial). The limited operational capacity of the current COEN facility and a general lack of resource inventories or formal mutual-aid agreements should be addressed to strengthen the country's resilience to disasters.

Figure 113. Survey responses indicated that stakeholders felt a lack of adequate resources to be a significant challenge to effective disaster response in Peru.

Findings: Resources Designated for Disaster Management

Forty-two percent (42%) of survey respondents felt their organizations do not have adequate staffing to conduct disaster response. Though 74% indicated their organizations maintain Emergency Operations Centers (EOCs), only 40% felt their EOCs have adequate resources to perform their responsibilities effectively. When asked to describe the greatest challenge to effective disaster response, respondents consistently referenced a lack of adequate resources. These responses validate interview findings which highlight resource limitations as a significant challenge for Peru's disaster management capacity.

Peru maintains a fully-operational Centro de Operaciones de Emergencia Nacional (COEN) through INDECI which complies with international best practices for EOC operations. Security exists at the front gate with a guard and a mandatory identification check to gain entrance to the facility. The COEN utilizes a state-of-the-art, redundant communications system and has implemented hazard-warning systems into its emergency operations. The COEN maintains one dedicated conference room with capacity for ten persons

to facilitate meetings as necessary. Interviewees noted that the small size of the COEN facility hampers operations and collaboration.

The main floor (basement level) of the COEN is an operations room with computers and screens running 24/7. Trained staff members run the Center on a full-time basis and use a Common Operating Picture (COP) to facilitate collaborative planning. However, one limitation raised in interviews was that the COEN facility is not regularly accessible to sectoral leadership or liaison representatives. As a result, inter-agency coordination and collaboration may be limited during disasters, and information may be excluded from the COP.

The COEN is exposed to impacts from both large earthquakes and extensive flooding. Operations are particularly susceptible to flood hazards, as they are located primarily at the basement level. Central placement along major roads could potentially impede access to the COEN in the event of a major disaster. It was also noted that there are no helicopter landing pads located within a convenient distance to the facility. To acknowledge these issues and expand the capacity of the national EOC, Peru is in the process of constructing a new COEN facility.

At the subnational level, each region receives $500,000 annually to operate a regional EOC, referred to as Centro de Operaciones de Emergencia Regional (COER). Regional governments must organize, implement, and maintain COERs as permanent regional facilities, as well as utilize SINPAD in their EOC operations. EOCs are further operationalized at the provincial, district, and sectoral levels through the following EOCs:

- Centro de Operaciones de Emergencia Provincial (COEP);
- Centro de Operaciones de Emergencia Distrital (COED); and
- Centro de Operaciones de Emergencia Sectorial (COES).

Throughout the CDM assessment, GIS information was gathered, which highlighted resources designated for disaster management response, including:

- 131 INDECI warehouses;
- 89 PRONAA warehouses;
- 11,190 sheds designated for response;
- Entities with capacities for emergency preparedness and disaster monitoring (2015); and
- Communities with Early Warning Systems (2015).

Findings: Inventory of Available Resources

Working with stakeholders and partners, an inventory of NGO resources to include available stock is in the process of being compiled by REDHUM. While this list will be instrumental in providing a picture of NGO resource availability, it represents only a small proportion of disaster resources for the country. A national inventory of available resources for disaster management was not provided for this analysis.

Findings: Mutual-Aid Agreements

Anecdotal evidence, provided through interviews with key CDM stakeholders, suggested that informal mutual-aid agreements do exist within the country. Survey data validated this information, with 63% of

survey respondents stating their organizations have pre-established agreements for support, such as mutual-aid agreements, during times of disaster.

Findings: EOC Equipment

Stakeholder interviews provided an up-to-date inventory of communications equipment available within the COEN. However, it represents only a small part of the COEN's total resources, and does not include regional EOCs. A complete list of all available EOC supplies for disaster management at any level was not provided for this analysis.

Gaps

The following gaps were identified:

1. The current COP does not promote inter-agency stakeholder coordination and collaboration in the event of a disaster, hindering effective disaster decision-making.
2. The current COEN does not adequately meet the disaster management needs of Peru, leaving gaps in Peru's ability to effectively respond in the event of a major disaster.
3. The lack of a national inventory of available resources for disaster management reduces the overall effectiveness and efficiency of Peru's SINAGERD system.
4. Explicit agreements of formal mutual-aid were found to be lacking for the purposes of disaster management in Peru.
5. The lack of available supply lists for the country's national and regional EOCs reduces overall effectiveness and efficiency for disaster response operations.

Recommendations

It is recommended that Peru:

1. Enhance or develop a COP (Common Operating Picture) system for use within the COEN to help consolidate information and improve the effectiveness of disaster decision-making among sectoral leadership and liaison representatives.
2. Complete and utilize the new COEN facility, ensuring proximity between the COEN and helicopter landing pads, as well as promoting the structural integrity of the COEN to withstand all potential hazards.
3. Develop and maintain an inventory of available resources for disaster management at the national level to strengthen Peru's disaster management capacity.
4. Promote the formalization and increased use of mutual-aid agreements to address budgetary and resource shortfalls to supplement preparedness measures throughout the country.
5. Develop and maintain supply lists for the country's national and regional EOCs to strengthen Peru's response capabilities.

Recommended Projects to Enhance CDM

The following recommended projects have been developed based on the findings, gaps and recommendations identified above. The recommended projects are grouped according to the five CDM components. Refer to Table 103 and Table 104 for additional information on the evaluation.

If only a select number of the following major projects can be completed, it is PDC's recommendation that Peru focus on the highest impact projects – identified as *significant* – in order to increase the comprehensive disaster management capability of Peru.

Table 103. Definitions

Definitions	
Level of Effort	Estimated length of time it will take to complete the project once it is started
Difficulty	Overall complexity based on the estimated amount of staff time, resources, and collaboration required to complete the project
Cost	Estimated annual cost of the project, not including salaries, based on a percentage of the current NDMO annual budget
Impact	The amount the project will increase the comprehensive disaster management capability of the nation

Table 104. Ratings

Ratings		
Level of Effort		12 months or less
		13 – 60 months
		>61 months
Difficulty	Simple	Few resources, time or collaboration required to implement
	Medium	Some resources, time or collaboration required
	Complex	A great deal of resources, time, or collaboration required
Cost	$	<1% of NDMO operational budget on an annual basis
	$$	1% to 10% of NDMO operational budget on an annual basis
	$$$	>10% of NDMO operational budget on an annual basis
Impact	Minor	Some impact on increasing the CDM capability of the nation
	Moderate	Moderate impact on increasing the CDM capability of the nation
	Significant	Significant impact on increasing the CDM capability of the nation

Table 105. Recommended Projects for CDM Theme: Good Leadership by Professionally Trained Officials

CDM Theme: Good Leadership by Professionally Trained Officials				
Recommendation: *To further strengthen the professionalization of disaster management in Peru.*	**Level of Effort**	**Difficulty**	**Cost**	**Impact**
Expand and institutionalize cooperation and coordination between INDECI and CENEPRED that fosters information sharing between organizational leadership and staff members. This will result in a unified approach to efficiently communicate requirements and capabilities to all elements of Peru's disaster management structure.	24	Medium	$	Significant
Take steps to build a better understanding of the drivers of staff turnover (political, financial, etc.) and establish a plan to support, encourage, and maintain senior leadership in disaster management.	12	Simple	$	Moderate
Expand technical capability to extend the reach of disaster management training via online and web-based training curriculum.	18	Medium	$$	Significant

Table 106. Recommended Projects for CDM Theme: Foundation of Supportive Values for Government Action

CDM Theme: Foundation of Supportive Values for Government Action				
Recommendation: *To enhance government support for disaster management efforts at all administrative levels.*	**Level of Effort**	**Difficulty**	**Cost**	**Impact**
Explore alternative funding sources to increase the availability of dedicated disaster management funds within the national budget to ensure that DRR efforts align with national priorities.	36	Medium	$$	Significant

Table 107. Recommended Projects for CDM Theme: Legal Authority to Act

CDM Theme: Legal Authority to Act				
Recommendation: *To ensure the development and implementation of relevant disaster management legislation throughout Peru.*	**Level of Effort**	**Difficulty**	**Cost**	**Impact**
Within SINAGERD, establish clear designation of roles and responsibilities for organizations active in disaster response. Socialize and conduct training to ensure that these roles are widely understood and applied.	36	Medium	$$	Significant
Increase the public availability of local plans, both online and in printed form, to strengthen subnational disaster management capacity and capabilities.	6	Simple	$	Moderate
Establish a more formalized timeline for updates to disaster response plans and SOPs to ensure that lessons learned are integrated on a regular basis. This will allow leadership the opportunity to ensure that advances in the field of disaster management and DRR are reflected in all policies and procedures	12	Medium	$	Moderate

Prioritize the full implementation of SINAGERD at the regional level to enhance decentralization, stakeholder participation, coordination, and collaboration for disaster management initiatives across the country.	12	Medium	$	Moderate

Table 108. Recommended Projects for CDM Theme: Advocacy Supporting Action

CDM Theme: Advocacy Supporting Action				
Recommendation: *To further strengthen non-governmental stakeholder engagement and support for disaster management activities in Peru.*	**Level of Effort**	**Difficulty**	**Cost**	**Impact**
Prioritize the continued rehabilitation of the areas hardest hit by Pisco's 2007 earthquake to increase resilience against future disasters, and review legislation and plans to streamline the recovery process following major disasters in Peru.	60+	Medium	$$$	Significant

Table 109. Recommended Projects for CDM Theme: Necessary Institutional Resources

CDM Theme: Necessary Institutional Resources				
Recommendation: *To increase the availability of and access to the necessary resources for effective disaster management in Peru.*	**Level of Effort**	**Difficulty**	**Cost**	**Impact**
Enhance or develop a COP (Common Operating Picture) system for use within the COEN to help consolidate information and improve the effectiveness of disaster decision-making among sectoral leadership and liaison representatives.	18	Simple	$$	Significant
Complete and utilize the new COEN facility, ensuring proximity between the COEN and helicopter landing pads, as well as promoting the structural integrity of the COEN to withstand all potential hazards.	60+	Complex	$$$	Significant
Develop and maintain an inventory of available resources for disaster management at the national level.	18	Complex	$$	Moderate
Promote the formalization and increased use of mutual-aid agreements to address budgetary and resource shortfalls to supplement preparedness measures throughout the country.	12	Simple	$	Moderate
Develop and maintain supply lists for the country's national and regional EOCs to strengthen Peru's response capabilities.	18	Medium	$$	Moderate

CDM Recommendations for Peru by Cost

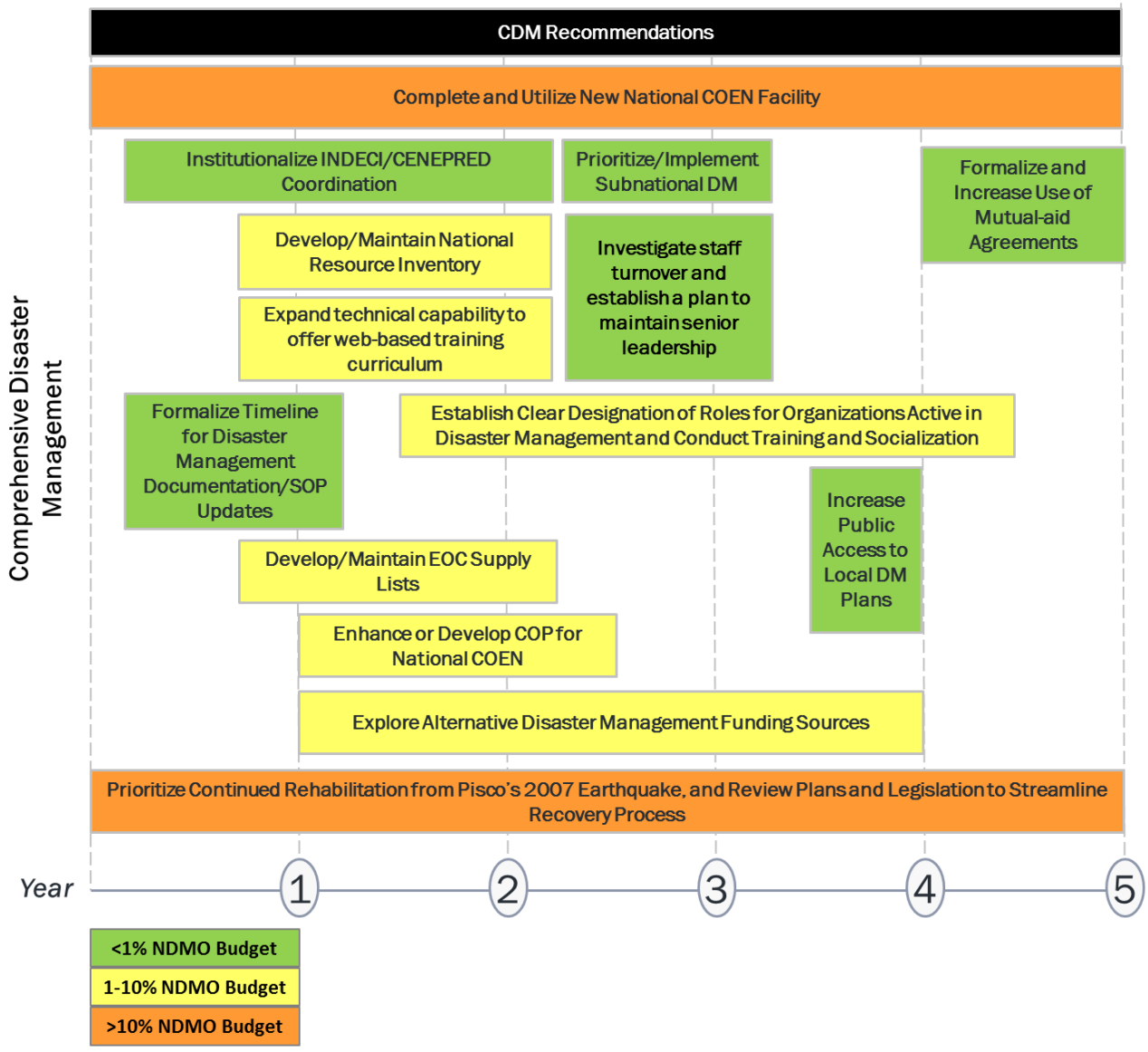


Figure 114. CDM Recommendations for Peru by Cost - Sample 5-Year Plan

Conclusion

The goal of disaster management is to create safer communities and implement programs that protect human life, reduce losses and ensure rapid recovery. Based on the results of the NDPBA, the following overarching recommendations are designed to acknowledge the complex drivers of risk that are prevalent throughout the country, to provide a framework for a Five-Year Action Plan for Peru and support stakeholders in their efforts to strengthen DRR in Peru.

Figure 115 below provides the consolidated recommendations of the Peru National Disaster Preparedness Baseline Assessment Project. The NDPBA findings describe an overall robust and capable national disaster management system in Peru. The analyses and assessments provided in the preceding sections identify strengths and competencies across all sectors of disaster management. As Peru moves forward with its national DRR efforts, the suggested objective should be to enhance those areas where Peruvian disaster management demonstrates a high level of readiness, while enhancing DRR efforts by addressing the gaps and recommendations identified in both the RVA and CDM analyses. It is recommended that Peru reassess the progress of its DRR efforts at the five-year point, at a minimum, to evaluate RVA and CDM findings based on investments in resources, processes, structures, and – most important – the people who support national and regional efforts to save lives and protect property through building a more disaster-resilient nation.

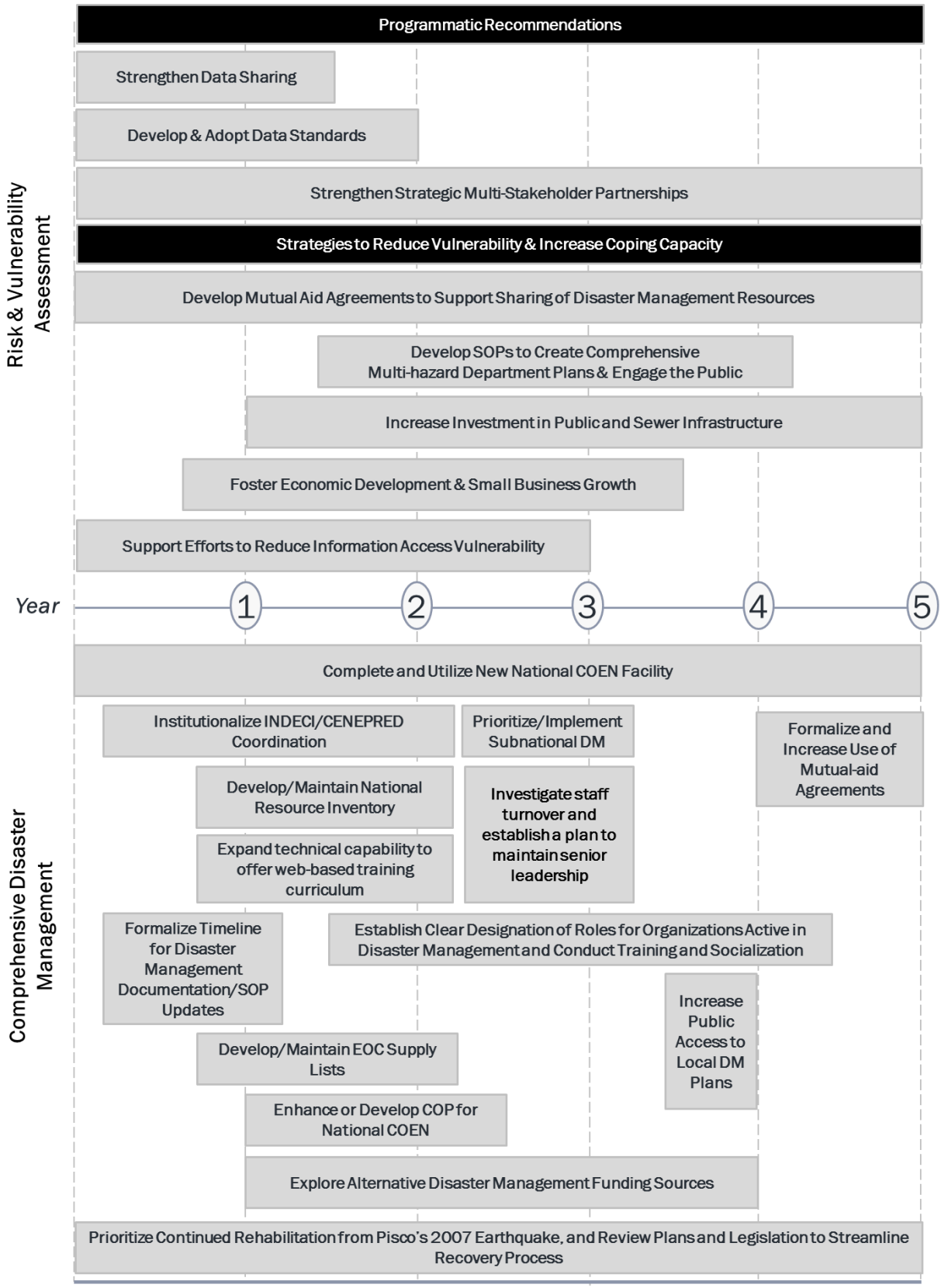


Figure 115. Peru National Disaster Preparedness Baseline Assessment (NDPBA) Consolidated Recommendations

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Appendices

PERU

NATIONAL DISASTER PREPAREDNESS BASELINE ASSESSMENT

PACIFIC DISASTER CENTER

Appendix A: RVA Component Index Hierarchies & Thematic Rationale

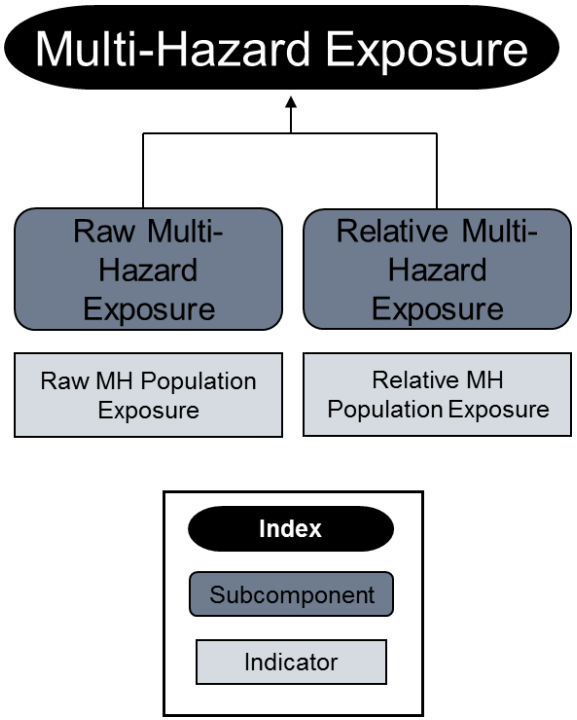

Figure 116. RVA - Multi-Hazard Exposure Index Construction

Table 110. RVA - MHE Scores and Ranks for all Indices and Subcomponents

Region	MHE Index		Raw MHE		Relative MHE	
	Score	Rank	Score	Rank	Score	Rank
Amazonas	0.427	15	0.169	18	0.685	11
Ancash	0.622	11	0.573	10	0.672	13
Apurímac	0.196	22	0.117	21	0.276	22
Arequipa	0.738	5	0.701	6	0.775	7
Ayacucho	0.166	24	0.177	17	0.155	23
Cajamarca	0.754	3	0.804	4	0.704	9
Callao	0.691	8	0.556	11	0.827	4
Cusco	0.661	10	0.661	7	0.661	14
Huancavelica	0.402	17	0.195	16	0.608	15
Huánuco	0.179	23	0.230	15	0.128	24
Ica	0.682	9	0.446	13	0.919	3
Junín	0.795	2	0.765	5	0.824	5
La Libertad	0.857	1	1.000	1	0.714	8
Lambayeque	0.594	13	0.596	9	0.592	16
Lima	0.699	7	1.000	1	0.399	21
Loreto	0.120	25	0.241	14	0.000	25
Madre de Dios	0.268	21	0.000	25	0.536	19
Moquegua	0.421	16	0.040	24	0.802	6
Pasco	0.399	19	0.103	22	0.694	10
Piura	0.704	6	0.868	3	0.541	18
Puno	0.597	12	0.651	8	0.543	17
San Martin	0.754	4	0.507	12	1.000	1
Tacna	0.400	18	0.122	20	0.679	12
Tumbes	0.515	14	0.088	23	0.942	2
Ucayali	0.315	20	0.167	19	0.462	20

Table 111. RVA - Multi-Hazard Exposure Metadata

Multi-Hazard Exposure					
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**	**Notes**
Raw Exposure	Raw Population Exposure	Multiple, see description	Multiple, see description	Cumulative raw count of person units exposed to multiple hazards, including volcanic ash, tsunami, earthquake, flood, low temperature, and mass movement for Peru by Region. Exposed person units are calculated by summing the total population exposed to each hazard type in the Region. Volcanic ash (2007, 2013) and Mass movement (2010) data was provided by INGEMMET. Tsunami (2013) data was provided by DHN. Earthquake (2014) data was provided by IGP. Low temperature (2015) data was provided by CENEPRED. Flood (2015) was provided by ANA. Population projection (2015) at the district level was provided by INEI.	Hazard Zone Definitions: Flood: Districts with Flood Critical Points within boundary Volcanic Ash: Districts exposed to ash fall for eruptions of magnitude moderate or large from Misty (2007), Sabancaya & Ubinas (2013) Low Temperature: High and Very High Susceptibility Mass Movement: High and Very High Susceptibility Tsunami: Inundation areas Earthquake: Districts intersecting historic earthquake areas with maximum seismic intensity 7-11 on the Mercalli scale
Relative Exposure	Relative Population Exposure	Multiple, see description	Multiple, see description	Cumulative raw count of person units exposed to multiple hazards per capita for Peru by Region. Hazards include volcanic ash, tsunami, earthquake, flood, low temperature, and mass movement. Exposed person units are calculated by summing the total population exposed to each hazard type in the Region then dividing by the population. Volcanic ash (2007, 2013) and Mass movement (2010) data was provided by INGEMMET. Tsunami (2013) data was provided by DHN. Earthquake (2014) data was provided by IGP. Low temperature (2015) data was provided by CENEPRED. Flood (2015) was provided by UNISDR. Population projection (2015) at the district level was provided by INEI.	

Vulnerability

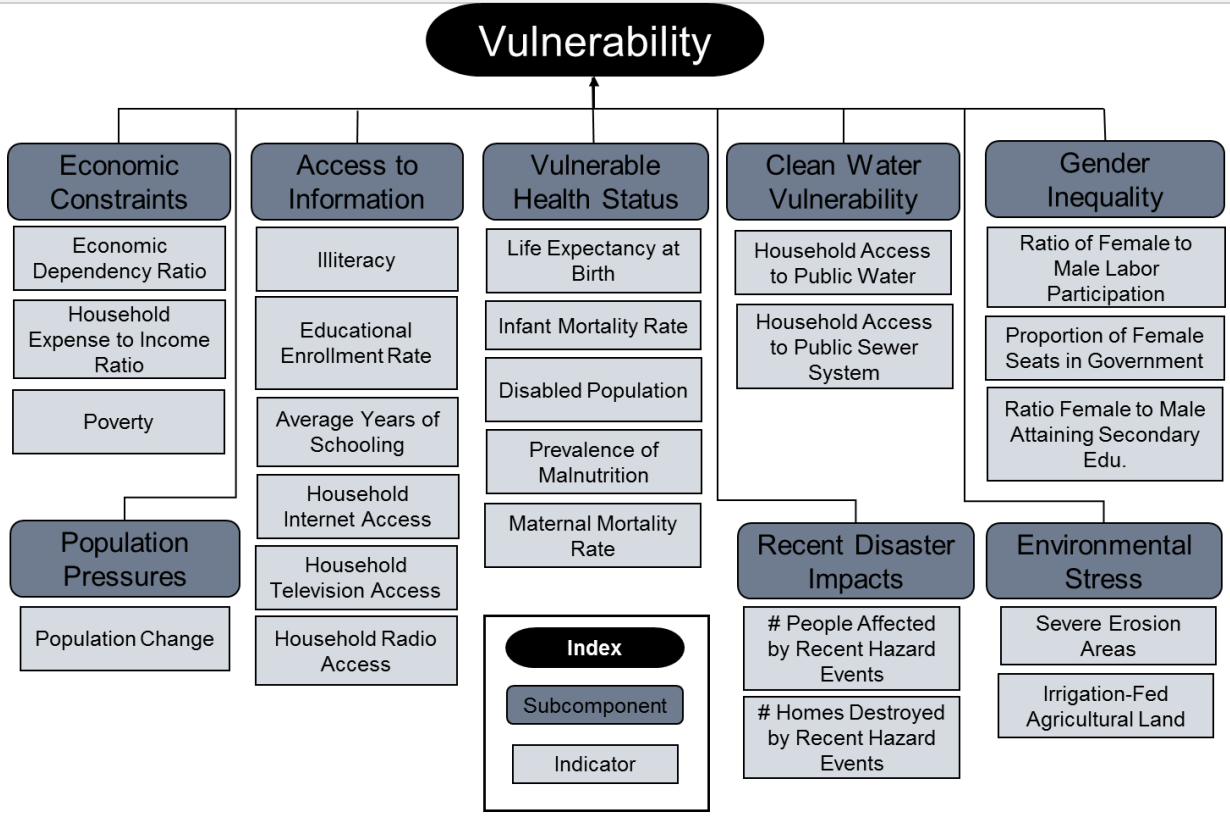

Figure 117. RVA - Vulnerability Indictors

Table 112. RVA - Vulnerability Subcomponent Theme Rationale

Subcomponent Theme	Rationale for Inclusion
Economic Constraints	Represent limitations on resources available to take hazard mitigation and preparedness measures
Access to Information	Represents the ability to access and comprehend hazard- and disaster-related information before, during and after an event. If mediums of information exchange are limited, or if people lack familiarity with somewhat technical information, critical information on impending hazard events, preparedness measures, available resources, and mitigation options may not be received.
Access to Clean Water	Represents the general state of water-related infrastructure. Poor distribution and containment systems contribute to reduced water quality and increase the potential for spread of disease.

Vulnerable Health Status	Reflects the population's general health as an outcome of multiple factors (e.g., health care processes and practices, biophysical and socio-economic environment). Poor health contributes to increased susceptibility to injury, disease, and stress associated with disasters and may necessitate special accommodations for activities such as evacuation.
Population Pressures	Rapid changes in the size and distribution of a population are more difficult to plan for and can destabilize social, economic, and environmental systems and alter patterns of exposure.
Environmental Stress	Environmental stressors such as substantial water withdrawals and land degradation can damage habitat and reduce quantity and quality of resources required to maintain human health and livelihoods. Additionally, these stressors increase the likelihood and magnitude of hazards such as flooding, landslides, and subsidence and can exacerbate impacts.
Gender Inequality	Represents gender-based differences in access to resources, services, opportunities and formal economic and political structures. Marginalized populations are less likely to have their needs met under "normal" conditions, and therefore become more susceptible to harm during times of disaster. They may be overlooked in mitigation and preparedness planning and subsequent response and recovery activities.
Recent Disaster Impacts	Regions that have recently been affected by disaster may still be recovering and are more susceptible to additional stressors.

Table 113. RVA - Vulnerability Scores and Ranks for all Indices and Subcomponents

Region	Vulnerability Index		Economic Constraints		Access to Infor. Vuln.		Clean Water Vuln.		Vulnerable Health Status		Population Pressures		Gender Inequality		Recent Disaster Impacts		Environmental Stress	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Amazonas	0.42	15	0.51	10	0.61	8	0.59	9	0.56	3	0.08	22	0.52	11	0.26	17	0.22	18
Ancash	0.39	17	0.48	13	0.52	12	0.20	19	0.40	17	0.19	20	0.44	16	0.17	22	0.70	4
Apurímac	0.54	6	0.61	5	0.66	5	0.43	13	0.53	9	0.16	21	0.57	9	0.73	3	0.66	7
Arequipa	0.34	24	0.24	20	0.20	23	0.18	20	0.32	20	0.63	10	0.30	22	0.42	11	0.39	12
Ayacucho	0.61	2	0.72	2	0.74	4	0.45	12	0.56	4	0.68	8	0.60	7	0.68	5	0.46	10
Cajamarca	0.49	9	0.64	3	0.75	3	0.64	7	0.51	12	0.03	23	0.67	1	0.13	23	0.54	8
Callao	0.23	25	0.14	23	0.17	24	0.07	23	0.30	22	0.90	4	*	*	0.00	25	0.06	21
Cusco	0.43	13	0.45	15	0.46	16	0.35	16	0.56	5	0.24	19	0.50	13	0.56	8	0.33	14
Huancavelica	0.69	1	0.82	1	0.92	1	0.76	3	0.75	1	0.39	16	0.66	2	0.74	2	0.48	9
Huánuco	0.55	5	0.60	6	0.77	2	0.68	6	0.55	7	0.38	17	0.63	4	0.42	10	0.33	15
Ica	0.35	21	0.29	18	0.21	22	0.14	21	0.19	25	0.58	12	0.37	20	0.28	15	0.70	5
Junín	0.45	12	0.49	11	0.46	15	0.39	15	0.41	15	0.71	7	0.40	17	0.36	13	0.33	16
La Libertad	0.47	10	0.49	12	0.49	14	0.25	17	0.31	21	0.77	6	0.49	15	0.20	20	0.81	2
Lambayeque	0.45	11	0.57	7	0.44	17	0.23	18	0.23	24	0.43	14	0.51	12	0.21	19	1.00	1
Lima	0.35	23	0.20	22	0.16	25	0.04	25	0.24	23	1.00	2	0.40	18	0.05	24	0.67	6
Loreto	0.57	3	0.48	14	0.64	7	0.93	1	0.51	11	0.65	9	0.53	10	0.80	1	0.00	24
Madre de Dios	0.39	18	0.04	25	0.36	18	0.55	10	0.54	8	1.00	1	0.34	21	0.27	16	0.00	25
Moquegua	0.36	20	0.08	24	0.24	20	0.06	24	0.40	18	0.60	11	0.40	19	0.70	4	0.38	13
Pasco	0.50	8	0.54	9	0.57	10	0.70	5	0.55	6	0.34	18	0.57	8	0.53	9	0.16	19
Piura	0.51	7	0.62	4	0.53	11	0.46	11	0.43	13	0.40	15	0.64	3	0.25	18	0.77	3
Puno	0.56	4	0.55	8	0.65	6	0.72	4	0.74	2	0.47	13	0.60	6	0.66	6	0.05	22
San Martin	0.40	16	0.44	16	0.59	9	0.62	8	0.43	14	0.00	25	0.61	5	0.41	12	0.14	20
Tacna	0.35	22	0.24	21	0.23	21	0.07	22	0.39	19	0.82	5	0.25	24	0.34	14	0.43	11
Tumbes	0.37	19	0.27	19	0.29	19	0.41	14	0.41	16	0.90	3	0.28	23	0.18	21	0.24	17
Ucayali	0.43	14	0.35	17	0.49	13	0.92	2	0.53	10	0.03	24	0.50	14	0.57	7	0.02	23

*Unable to complete due to a lack of data

Table 114. RVA - Vulnerability Indicator Metadata

Vulnerability					
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**	**Notes**
Economic Constraints	Economic Dependency Ratio	INEI	2014	Ratio of dependents - people younger than 15 and older than 64 - to the working-age population - those ages 15-64	
	Expense to Income Ratio	INEI	2014	Ratio of average monthly household expenses to monthly household income	
	Poverty	INEI	2013	Incidence of Monetary Poverty	Data ware not reported for Callao
Access to Information Vulnerability	Illiteracy	INEI	2014	Percentage of the population aged 15 and older that are illiterate	
	Enrollment in Education	MINEDU	2013	Percentage of the population aged 5 - 24 years enrolled in the national education system	Enrollment includes tertiary education - we are using a wider age range to create a more conservative estimate of school enrollment
	Average Years of Schooling	INEI	2013	Average years of study completed by men and women over 25 years of age.	
	Household Internet Access	INEI	2014	Percentage of households with access to internet service	
	Household Television Access	INEI	2014	Percentage of households with access to internet service	
	Household Radio Access	INEI	2014	Percentage of households with at least one radio or sound equipment.	

Access to Clean Water Vulnerability	Access to water	INEI	2014	Percentage of households with access to public water source	Original wording: HOGARES QUE SE ABASTECEN DE AGUA MEDIANTE RED PÚBLICA
	Access to improved sanitation	INEL	2014	Percentage of households with access to public sewage system	Original Wording: HOGARES QUE RESIDEN EN VIVIENDAS PARTICULARES QUE TIENEN RED PÚBLICA DE ALCANTARILLADO
Vulnerable Health Status	Life Expectancy	INEI	2010 -2015	Life Expectancy at birth	
	Infant Mortality Rate	INEI	2010 -2015	Infant mortality rate per 1,000 live births	
	Disabled Population	INEI	2012	Percentage of the population that has one or more disabilities	To determine the total population for which disability status was determined, we summed the count of the population with a limitation and the count of the population without a limitation. Exact wording is 'Persona con alguna limitacion'
	Prevalence Malnourished	INEI	2013	Rate of chronic Malnutrition in children aged under 5 years	Data for Callao not reported.
	Maternal Mortality Ratio	MINSA	2013	Ratio of maternal deaths to 100,000 births	The mortality was calculated as ratio of maternal deaths to births. Normally, maternal mortality rate is maternal deaths: LIVE births. As we are using ALL births from 2013, the ratio calculated herein may be a slight underestimate of maternal mortality.
Population Pressures	Population Change	INEI	2010 -2015	Average annual percentage population change for the period 2010 - 2015	Note from original table: births-deaths +(-) migration (per 100 persons)

Gender Inequality	Ratio of Female to Male Labor Participation	INEI	2013	Ratio of female labor participation rate to male labor participation rate Labor participation expressed at the ratio of active working-age population to total working - age population - by gender	Data was not reported for Callao
	Proportion of Female Seats in Local Government	ONPE	2010	Proportion of female representatives in local government (Province and District level) by proportion of females in total population	
	Ratio of Female to Male Secondary Education Enrollment	INEI	2013	Ratio of female secondary school attainment to male secondary school attainment	
Recent Disaster Impacts	Recent Hazard-related Deaths per 10k Persons	INDECI (hazard data), INEI (population data)	2014	The average annual number of people affected by natural hazards that have occurred in recent years (2010-2014), per 10,000 persons	Hazards include: volcanic activity, avalanche, landslide, erosion, frost, mud/rockslide, forest fire, flood, intense rain, tidal wave, drought, earthquake, storm, and strong winds
	Recent Homes Destroyed by Hazards per 10k Persons	INDECI (hazard data), INEI (population data)	2014	The average annual number of homes destroyed from natural hazards that have occurred in recent years (2010-2014), per 10,000 persons	Hazards include: volcanic activity, avalanche, landslide, erosion, frost, mud/rockslide, forest fire, flood, intense rain, tidal wave, drought, earthquake, storm, and strong winds
Environmental Stress	Severe Erosion Area	CENEPRED	Received 2015	Percentage of total Region land area with severe erosion	
	Agricultural Land that is Irrigation Fed	CENEPRED	Received 2015	Percentage of total Region land area that is irrigation-fed agricultural land	

Coping Capacity

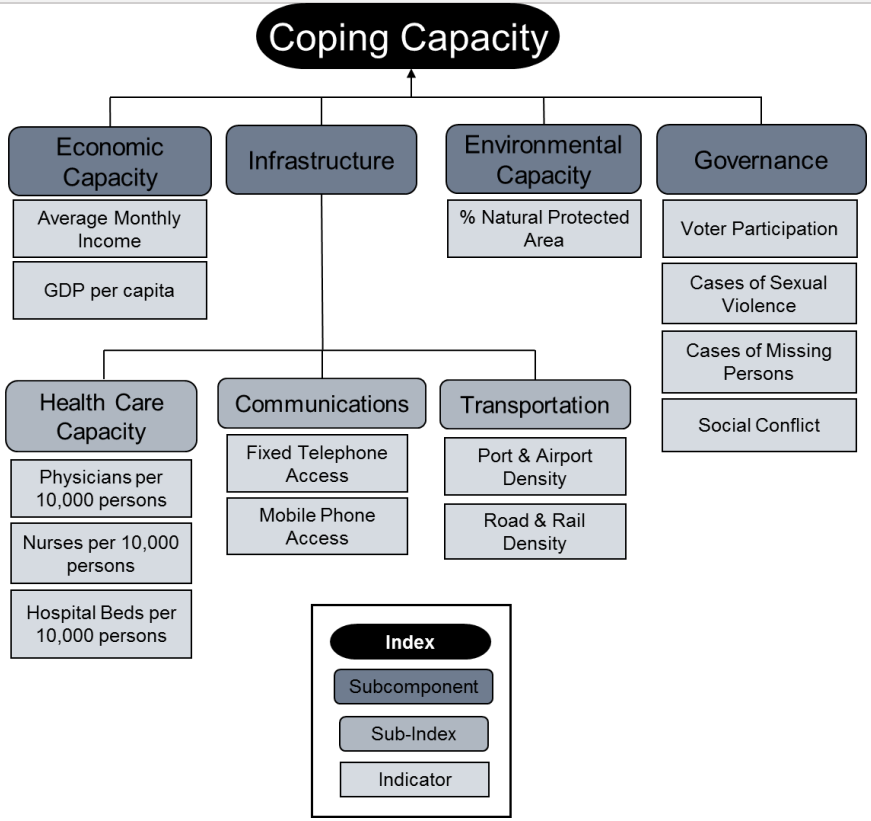

Figure 118. RVA - Coping Capacity Indicators

Table 115. RVA - Coping Capacity Subcomponent Theme Rationale

Subcomponent Theme	Rationale for Inclusion
Governance	Reflects the stability and effectiveness of institutional structures to provide equitable public services, freedom in selecting government, and enforcement of laws to prevent and control crime and violence.
Economic Capacity	Represents a region's ability to absorb immediate economic losses and quickly mobilize financial assets to provide needed assistance.
Environmental Capacity	Represents the ability of the environment to recover from a shock and maintain species health, biodiversity, and critical ecosystem services after impact.
Infrastructure	Represents the ability to learn about needs and exchange information (Communications), and physically distribute goods and services to those affected (Transportation and Health Care).

Table 116. RVA - Coping Capacity Scores and Ranks for all Indices and Subcomponents

Region	Coping Capacity Index		Governance		Econ. Capacity		Environ. Capacity		Infrastructure Index		Healthcare (Infra.)		Transport (Infra)		Communication (Infra.)	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Amazonas	0.389	21	0.600	12	0.171	20	0.301	11	0.308	22	0.343	17	0.352	21	0.228	24
Ancash	0.514	9	0.575	13	0.463	9	0.296	12	0.556	10	0.371	14	0.629	7	0.667	8
Apurímac	0.282	24	0.348	21	0.113	24	0.006	22	0.459	13	0.521	7	0.557	9	0.298	21
Arequipa	0.721	2	0.751	2	0.797	4	0.406	7	0.724	3	0.893	1	0.440	18	0.838	3
Ayacucho	0.233	25	0.262	24	0.163	21	0.006	21	0.347	19	0.352	15	0.392	20	0.296	22
Cajamarca	0.412	19	0.687	7	0.156	22	0.106	17	0.352	18	0.084	25	0.658	5	0.314	19
Callao	0.663	4	0.633	11	0.760	6	0.000	23	0.880	1	0.664	6	1.000	1	0.975	2
Cusco	0.498	11	0.541	15	0.566	8	0.289	13	0.446	14	0.424	12	0.449	16	0.465	14
Huancavelica	0.309	23	0.556	14	0.04	25	0.000	23	0.305	23	0.085	24	0.637	6	0.193	25
Huánuco	0.424	18	0.703	6	0.128	23	0.133	15	0.392	16	0.267	19	0.446	17	0.463	15
Ica	0.684	3	0.727	3	0.764	5	0.336	10	0.674	5	0.733	3	0.516	13	0.773	5
Junín	0.444	16	0.489	20	0.319	14	0.404	8	0.515	11	0.398	13	0.556	10	0.590	11
La Libertad	0.558	6	0.723	4	0.427	12	0.090	18	0.612	7	0.484	10	0.606	8	0.744	6
Lambayeque	0.501	10	0.666	9	0.247	17	0.031	19	0.679	4	0.506	9	0.754	4	0.778	4
Lima	0.799	1	0.840	1	0.923	2	0.178	14	0.855	2	0.804	2	0.783	2	0.978	1
Loreto	0.390	20	0.532	18	0.306	15	0.551	6	0.184	25	0.139	22	0.138	24	0.275	23
Madre de Dios	0.546	7	0.319	23	0.847	3	1.000	1	0.426	15	0.437	11	0.244	23	0.597	10
Moquegua	0.594	5	0.492	19	0.992	1	0.023	20	0.588	8	0.682	4	0.495	14	0.588	12
Pasco	0.528	8	0.534	17	0.46	10	0.816	3	0.470	12	0.506	8	0.533	12	0.371	18
Piura	0.455	15	0.657	10	0.336	13	0.107	16	0.391	17	0.150	21	0.460	15	0.564	13
Puno	0.373	22	0.535	16	0.177	19	0.366	9	0.312	20	0.202	20	0.431	19	0.304	20
San Martin	0.464	14	0.706	5	0.193	18	0.565	5	0.308	21	0.123	23	0.351	22	0.450	17
Tacna	0.434	17	0.262	25	0.671	7	0.000	23	0.647	6	0.670	5	0.535	11	0.737	7
Tumbes	0.490	12	0.332	22	0.440	11	1.000	1	0.588	9	0.348	16	0.755	3	0.660	9
Ucayali	0.469	13	0.669	8	0.277	16	0.701	4	0.248	24	0.270	18	0.013	25	0.461	16

Table 117. RVA - Coping Capacity Indicator Metadata

Coping Capacity					
Subcomponent	**Indicator**	**Source(s)**	**Year**	**Description**	**Notes**
Infrastructure - Healthcare Capacity	Physicians per 10k Persons	INEI (from MINSA); INEI (Population Data)	2014	Physicians per 10,000 population	
	Nurses per 10k Persons	INEI (from MINSA); INEI (Population Data)	2014	Nurses per 10,000 population	Includes nurses and 'colegiadas'
	Hospital beds per 10k Persons	INEI (from MINSA); INEI (Population Data)	2013	Hospital beds per 10,000 population	
Infrastructure - Transportation	Road and Rail Density	MTC	2014	Length of roads/rail per 10,000 kilometers land area	
	Port and Airport density	MTC	2014	Count of ports and airports per 10,000 sq km	Data for Callao represented a severe outlier and was removed from index construction
Infrastructure - Communications	Fixed Telephone Access	INEI	2014	Percentage of households with fixed phone line	
	Mobile Phone Access	INEI	2014	Percentage of households with at least one member that has a mobile telephone	
Economic Capacity	Average Monthly Income	INEI	2014	Average Monthly Income	
	GDP per capita	INEI	2014	Gross Domestic Product per Capita	Data are based on projections from 2007. Data for Callao not reported.
Environmental Capacity	% Protected area	CENEPRED	Received 2015	Percentage of total area that is protected natural area	

Governance	Voter Participation	INEI (from JNE); INEI (Population Data)	2014	Electoral population that participated in regional and municipal elections per 10,000 persons.	
	Sexual Violence	MININTER (crime data); INEI (population data)	2014	Registered cases of sexual violence per 10,000 persons	
	Missing Persons	MININTER (crime data); INEI (population data)	2014	Registered cases of missing persons per 10,000 persons	Data for Amazonas not reported
	Social Conflict	Defensoria del Pueblo; INEI (population data)	2013	The average annual number of active and resolved social conflicts within a region per 10,000 persons. Conflict were most commonly due to disputes in the access of resources for livelihood.	Social conflicts are divided into 6 different categories that indicate the primary cause of conflict. These categories include socio-environmental disputes, demarcation of territory, labor disputes, local government issues, regional government issues, national government issues, and other (page 114). Government conflicts are most commonly related to issues of corruption, lack of transparency or other irregularities by elected or appointed government officials (pg. 122). An active conflict is one where some observable action had been taken by one or more sides of the conflict (e.g. public protest, negotiations, etc.) (page 122-126). A resolved conflict is one where an agreement had been reached to end the conflict between the participating parties. There are identified agencies that are responsible for resolving these conflicts (page 117). There are no clear definitions for conflicts classified as "latent" or "transferred to observation." Consequently, these conflicts were not included in the indicator calculation.

Appendix B: RVA Index Construction

This appendix details additional information on RVA index construction.

After finalizing the datasets to be used in the analysis, indicators were created. Indicators are simply standardized datasets representing one aspect of multi-hazard risk that can be combined together in a meaningful way. The indicators used to create subcomponent indices represent a wide range of concepts and are often measured using inconsistent units, ranges, and scales. In order to make meaningful comparisons between concepts, and to combine them and perform the mathematical operations required to create a single composite index score, indicator values were normalized. Normalization produces a consistent value range and direction across all indicators.

However, as data skewness and outliers may heavily influence the distribution of observations along a normalized scale, some transformations were made prior to rescaling. Minimums, maximums, standard deviations, means, and skew were calculated for each dataset. Datasets showing substantial skewness (beyond +/-1) were evaluated on a case by case basis and transformed using common statistical methods (e.g., natural log, square root, or cube root). In addition to controlling for skewness, indicators were evaluated to ensure consistent conceptual direction between the data and the overall concept modeled in the subcomponent and component index. For example, an indicator of households' access to internet is included within the Information Access Vulnerability subcomponent in the Vulnerability Index. However, *increases* in household internet access conceptually *decrease* vulnerability. To match the direction of the indicator with its effect on overall vulnerability, the data is transformed using the reflection equation:

(Indicator maximum value + 1) – Observed indicator value

Following these transformations, indicators were normalized to create scaled scores ranging from 0 to 1, with the following equation:

(Observed indicator value – Indicator minimum value) /
(Indicator maximum value – Indicator minimum value)

In cases where an indicator observed value was outside +/- 3 standard deviations from the mean, these were excluded from the scaling equation (e.g., 'indicator minimum value' and 'indicator maximum value' in the above equation). Instead the value closest to 3 standard deviations of the mean (without exceeding) was substituted, replacing the minimum or maximum value.

This approach to establishing minimum and maximum values conceptually anchors the range, indicating relative position between the "worst realistic case" and the "best realistic case" for each indicator in the country. Subcomponent scores represent the unweighted average of indicators. Likewise, component Indices (MHE, V, and C) represent the average of their respective subcomponent scores. This method maintains a consistent scale and range through the index construction hierarchy, with a minimum value of 0 and a maximum value of 1.

It is important to note that "0" does not represent "No Risk," (or Hazard Exposure or Coping Capacity or Vulnerability), but instead indicates the minimum realistic case relative to the data analyzed for the country. The resulting indices are mapped using a quantile classification to illustrate the relative distribution of each overall concept throughout Peru.

Appendix C: CDM Preparedness Survey (July 2014)

Introduction

As part of Comprehensive Disaster Management (CDM) data gathering efforts, stakeholder participants completed a preparedness survey during the Midterm Knowledge Exchange in Lima, Peru, on 15 July 2014. The survey was designed to assess the presence of comprehensive disaster management plans, specific components within these plans, and the drilling and exercising of plans within organizations at both the national and subnational level. The survey was organized into two sections – a quantitative portion (questions 1-28) and a qualitative portion (questions 29-33). Frequency tables for responses to survey questions 1-28 can be seen in Tables 120-147 contained in Annex A of this document.

A total of 48 stakeholders participated in the survey, of which 63% were male, 33% were female and 4% declined to state their gender. The respondents were largely from central government agencies (42%; 20/48), but also represented local government (6%; 3/48), the United Nations (12.5%; 6/48), non-governmental organizations (12.5%; 6/48), and one of the country's disaster management organizations, CENEPRED (4%; 2/48). Eleven respondents (23%) chose not to list their organizational affiliation. Roughly 29% of respondents were between the ages of 41-50, 29% were 51-60, 23% were 31-40, and the remainder were distributed across other age ranges (18-25, 26-30, 61-65).

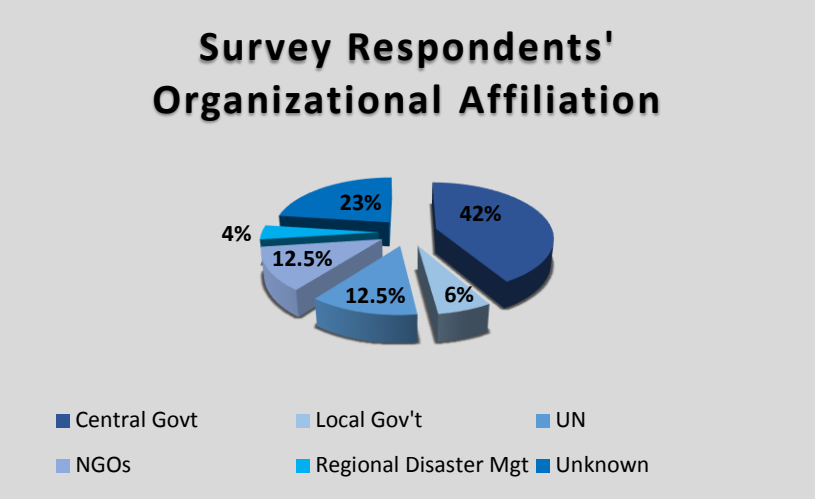

Figure 119. Organizational Affiliation of Respondents

Survey responses were consistently validated through stakeholder interviews conducted by PDC staff over the duration of the project. Interview participants came from provincial and national governmental organizations and NGOs, and included leaders and specialists.

Quantitative Section (Questions 1-28)

Availability and Accessibility of Disaster Plans

Over three-quarters (83%; 40/48) of survey participants reported that their organizations have comprehensive disaster management plans. Almost three-quarters (73%; 35/48) reported the presence of disaster plans for their organizations. Slightly more than two-thirds of participants (68%; 32/48) reported the existence of disaster preparedness plans, while significantly fewer organizations reported having recovery plans (38%; 18/48) or disaster mitigation plans (33%; 16/48) for their organizations. Almost two-thirds of plans included information on all hazard types (60%; 29/48). Over half (60%; 29/48) reported that their organizations' plans were regularly updated, and 79% (38/48) of plans are drilled or tested regularly.

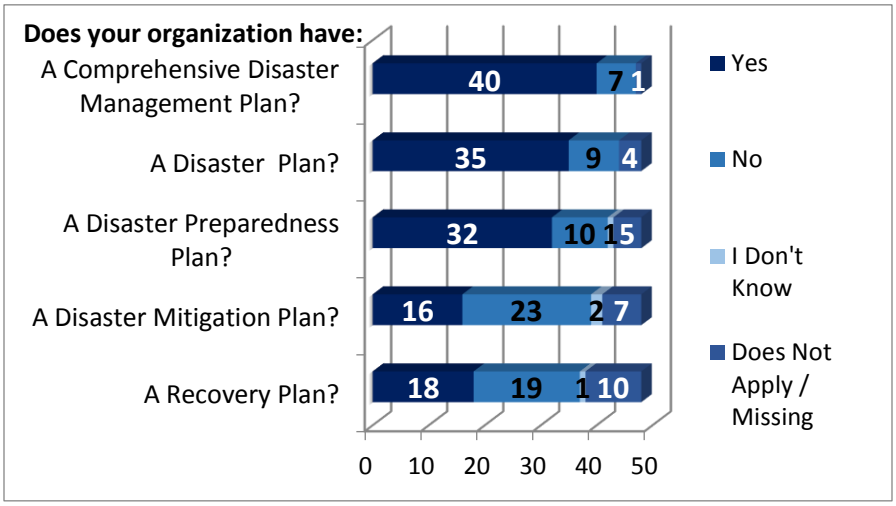

Figure 120. Availability of Disaster Management Plans

Planning Collaboration

Sixty-five percent (31/48) of survey participants reported their involvement in the drafting of one or more of their organization's disaster plans. Sixty-five percent (31/48) of participants also have access to copies of their organization's disaster management plans. Inter-agency or organizational sharing of plans is not universal, with only 48% (23/48) reporting that their disaster plans have been shared with other agencies or organizations active in disaster management.

Composition of Disaster Plans

Almost two-thirds of survey participants (60%; 29/48) reported that their organization's disaster management plans include information on all hazard types. Sixty-five percent (31/48) have disaster plans that address public outreach. Fifty-eight percent (28/48) reported their organization's disaster plans address early warning, and over two-thirds of participants (67%; 32/48) have disaster plans that address evacuation. Forty-eight percent (23/48) of participants reported their disaster plans address logistics management, but less than one-third (29%; 14/48) of participants have disaster plans that address transportation, and 38% (18/48) have disaster plans that address shelter operations. Nineteen percent (9/48) have plans that address public safety and security. One-third of respondents (33%; 16/48) reported that their organizations have disaster plans that address long-term community recovery.

Sixty-five percent (31/48) of survey participants have organizational disaster plans that address when and how to activate the organization's Emergency Operations Center and 63% (30/48) stated their plans address emergency communications. Nineteen percent (9/48) of respondents reported their organizations have disaster plans that address public works and engineering, with 23% (11/48) stating

their plans address public health and medical services. Thirty-three percent (16/48) maintain disaster plans that address search and rescue. Just over one-tenth of respondents (13%; 6/48) reported their organizational plans address oil and hazardous materials response. Twenty-three percent (11/48) have disaster plans that address agriculture and natural resources. *Table 118* summarizes the responses of those surveyed regarding specific components included in their disaster management plans.

Table 118. Frequency of responses to questions regarding specific components of disaster management plans in Peru.

Does plan include information on:	*Yes*		*No*		*Don't Know*		*Does Not Apply*		*Missing*	
	N	**%**	**N**	**(%)**	**N**	**%**	**N**	**%**	**N**	**%**
**All Hazard Types*	29	(60)	14	(29)	0	(0)	2	(4)	3	(6)
Public Outreach	31	(65)	12	(25)	1	(2)	2	(4)	2	(4)
**Early Warning*	28	(58)	16	(33)	0	(0)	3	(6)	1	(2)
Evacuation	32	(67)	12	(25)	0	(0)	3	(6)	1	(2)
**Logistics*	23	(48)	17	(35)	3	(6)	3	(6)	2	(4)
Shelter Ops.	18	(38)	24	(50)	1	(2)	4	(8)	1	(2)
EOC activation	31	(65)	9	(19)	1	(2)	5	(10)	12	(4)
**Transportation*	14	(29)	20	(42)	6	(13)	7	(15)	1	(2)
**Communications*	30	(63)	10	(21)	1	(2)	5	(10)	2	(5)
Public Works and Engineering	9	(19)	24	(50)	5	(10)	8	(17)	2	(4)
Public health and medical services	11	(23)	21	(44)	3	(6)	9	(19)	4	(8)
Search and Rescue	16	(33)	19	(40)	2	(4)	8	(17)	3	(6)
Hazardous Materials	6	(13)	27	(56)	5	(10)	7	(15)	3	(6)
Agricultural and Natural Resources	11	(23)	26	(54)	1	(2)	8	(17)	2	(4)
Public Safety	9	(19)	26	(54)	0	(0)	8	(17)	5	(10)
**Long-term Recovery*	16	(33)	23	(48)	1	(2)	5	(10)	3	(6)

* Rounding of values cause percentages to equal either 99 or 101.

Perceptions of Disaster Management Leadership and Programs

Nearly three-quarters (73%; 35/48) of survey participants felt their organizations exhibit strong disaster management leadership. However, just over half (54%; 26/48) believe that their organizations have effective disaster management programs.

Qualitative Section (Questions 29-33)

Questions 29-33 required open-ended responses from survey participants. Respondents generally provided brief answers to these questions that centered on the role of their organizations in providing

effective disaster management within Peru. Forty-six (96%) survey participants provided a definition of 'effective disaster management' for Question 29 (see **Error! Reference source not found.**). Responses h eavily favored the concepts of management and immediate response. Twenty-three respondents referenced either the word "management" or "response" in their answers. The next most common theme was that of "taking action" to reduce suffering. Six respondents included some reference to the minimization of negative impacts from disaster management actions in their answers. Additional recurrent themes included the "appropriate utilization of resources" – human, financial, and material – and information. Complete stakeholder responses to this question can be found in Annex B of this document.

Figure 121. Word Cloud for Question 29: "How do you define effective disaster management?"

Forty-seven (98%) respondents provided an answer to Question 30: "What is the role of your organization in disaster management?" The most common emergent theme was managing different phases of the disaster management system in Peru. Additional organizational roles varied, including, responding to disasters, disaster risk reduction, providing support, leading response at different levels, communicating and providing warning, and managing financial aspects of disasters.

Most of those surveyed (92%) responded to Question 31, which asked: "What are the three most effective preparedness activities that your organization has undertaken?" . Two predominant themes were identified: training and capacity building, and conducting drills and simulations across all levels of government. Risk reduction, and the provision of resources were additional recurring answers to this question.

Forty-six (96%) survey participants responded to Question 32: "How can your organization improve disaster management?" The two most common themes pertained to dedicating more resources (human, financial, and material) to disaster management, and building capacity at all levels of government. Other themes of note included improving information sharing mechanisms, conducting planning, integrating technology into the response system, communication and coordination. Refer to Figure 21 for a visual depiction of survey responses to Question 32.

Nearly all of those surveyed answered Question 33: "What is your organization's area of responsibility? (Local, provincial, national, all, etc.)". The majority of those surveyed were responsible for disaster management activities at the national level (33 respondents). Thirteen respondents dealt with disaster management at the local level, and six focused on the provincial level of the country. Other respondents worked at the district level or global level, and six worked all levels of disaster management.

Figure 122. Word Cloud for Question 32: "How can your organization improve disaster management?"

Annex A: Frequency Tables for CDM Preparedness Survey (Questions 1-28)

Table 119. Preparedness Survey – Question 1

Does your organization have a comprehensive disaster management plan?	*Frequency*	*Percent*
No	7	15
Yes	40	83
I don't know	0	0
Does not apply	1	2
Missing	0	0
Total	48	100

Table 120. Preparedness Survey – Question 2

Does your organization have a disaster plan?	*Frequency*	*Percent*
No	9	18.75
Yes	35	72.92
I don't know	0	0
Does not apply	3	6.25
Missing	1	2.08
Total	48	100

Table 121. Preparedness Survey – Question 3

Does your organization have a disaster preparedness plan?	*Frequency*	*Percent*
No	10	20.8
Yes	32	66.7
I don't know	1	2.1
Does not apply	3	6.2
Missing	2	4.2
Total	48	100

Table 122. Preparedness Survey – Question 4

Does your organization have a disaster mitigation plan?	*Frequency*	*Percent*
No	23	47.92
Yes	16	33.33
I don't know	2	4.17
Does not apply	4	8.33
Missing	3	6.25
Total	48	100

Table 123. Preparedness Survey – Question 5

Does your organization have a disaster recovery plan?	*Frequency*	*Percent*
No	19	39.58
Yes	18	37.50
I don't know	1	2.08
Does not apply	4	8.33
Missing	6	12.50
Total	48	100

Table 124. Preparedness Survey – Question 6

Did you participate in the drafting of any of the disaster plans?	*Frequency*	*Percent*
No	16	33.33
Yes	31	64.58
I don't know	0	0
Does not apply	1	2.08
Missing	0	0
Total	48	100

Table 125. Preparedness Survey – Question 7

Do you have a copy of the disaster management plan(s)?	*Frequency*	*Percent*
No	14	29.17
Yes	31	64.58
I don't know	0	0
Does not apply	1	2.08
Missing	2	4.17
Total	48	100

Table 126. Preparedness Survey – Question 8

Does your disaster management plan include information on all hazard types?	*Frequency*	*Percent*
No	14	29.17
Yes	29	60.42
I don't know	0	0
Does not apply	2	4.17
Missing	3	6.25
Total	48	100

Table 127. Preparedness Survey – Question 9

Has your plan been shared with other agencies or organizations active in disaster management?	*Frequency*	*Percent*
No	18	37.50
Yes	23	47.92
I don't know	6	12.50
Does not apply	1	2.08
Missing	0	0
Total	48	100

Table 128. Preparedness Survey – Question 10

Are your organization's disaster plans updated regularly?	*Frequency*	*Percent*
No	10	20.83
Yes	29	60.42
I don't know	4	8.33
Does not apply	2	4.17
Missing	3	6.25
Total	48	100

Table 129. Preparedness Survey – Question 11

Are your organization's disaster plans tested, drilled or exercised regularly?	*Frequency*	*Percent*
No	8	16.67
Yes	38	79.17
I don't know	0	0
Does not apply	2	4.17
Missing	0	0
Total	48	100

Table 130. Preparedness Survey – Question 12

Do your disaster plans address public outreach?	*Frequency*	*Percent*
No	12	25
Yes	31	64.58
I don't know	1	2.08
Does not apply	2	4.17
Missing	2	4.17
Total	48	100

Table 131. Preparedness Survey – Question 13

Do your disaster plans address early warning?	*Frequency*	*Percent*
No	16	33.33
Yes	28	58.33
I don't know	0	0
Does not apply	3	6.25
Missing	1	2.08
Total	48	100

Table 132. Preparedness Survey – Question 14

Do your disaster plans address evacuation?	*Frequency*	*Percent*
No	12	25.00
Yes	32	66.67
I don't know	0	0
Does not apply	3	6.25
Missing	1	2.08
Total	48	100

Table 133. Preparedness Survey – Question 15

Do your disaster plans address logistics management? (the movement of personnel and resources during times of disasters)	*Frequency*	*Percent*
No	17	35.42
Yes	23	47.92
I don't know	3	6.25
Does not apply	3	6.25
Missing	2	4.17
Total	48	100

Table 134. Preparedness Survey – Question 16

Do your disaster plans address shelter operations?	*Frequency*	*Percent*
No	24	50.00
Yes	18	37.50
I don't know	1	2.08
Does not apply	4	8.33
Missing	1	2.08
Total	48	100

Table 135. Preparedness Survey – Question 17

Do your disaster plans address when and how to activate the Emergency Operation Center?	*Frequency*	*Percent*
No	9	18.75
Yes	31	64.58
I don't know	1	2.08
Does not apply	5	10.42
Missing	2	4.17
Total	48	100

Table 136. Preparedness Survey – Question 18

Do your disaster plans address transportation during times of disasters?	*Frequency*	*Percent*
No	20	41.67
Yes	14	29.17
I don't know	6	12.50
Does not apply	7	14.58
Missing	1	2.08
Total	48	100

Table 137. Preparedness Survey – Question 19

Do your disaster management plans address emergency communications during times of disaster?	*Frequency*	*Percent*
No	10	21
Yes	30	62.5
I don't know	1	2
Does not apply	5	10.5
Missing	2	4
Total	48	100

Table 138. Preparedness Survey – Question 20

Do your disaster plans address public works and engineering?	*Frequency*	*Percent*
No	24	50.00
Yes	9	18.75
I don't know	5	10.42
Does not apply	8	16.67
Missing	2	4.17
Total	48	100

Table 139. Preparedness Survey – Question 21

Do your disaster plans address public health and medical services?	*Frequency*	*Percent*
No	21	43.75
Yes	11	22.92
I don't know	3	6.25
Does not apply	9	18.75
Missing	4	8.33
Total	48	100

Table 140. Preparedness Survey – Question 22

Do your plans address search and rescue?	*Frequency*	*Percent*
No	19	39.58
Yes	16	33.33
I don't know	2	4.17
Does not apply	8	16.67
Missing	3	6.25
Total	48	100

Table 141. Preparedness Survey – Question 23

Do your plans address oil and hazardous materials response (chemical, biological, radiological, etc.)?	*Frequency*	*Percent*
No	27	56.25
Yes	6	12.50
I don't know	5	10.42
Does not apply	7	14.58
Missing	3	6.25
Total	48	100

Table 142. Preparedness Survey – Question 24

Do your plans address agriculture and natural resources?	*Frequency*	*Percent*
No	26	54.17
Yes	11	22.92
I don't know	1	2.08
Does not apply	8	16.67
Missing	2	4.17
Total	48	100

Table 143. Preparedness Survey – Question 25

Do your plans address public safety and security?	*Frequency*	*Percent*
No	26	54.17
Yes	9	18.75
I don't know	0	0
Does not apply	8	16.67
Missing	5	10.42
Total	48	100

Table 144. Preparedness Survey – Question 26

Do your plans address long-term community recovery?	*Frequency*	*Percent*
No	23	47.92
Yes	16	33.33
I don't know	1	2.08
Does not apply	5	10.42
Missing	3	6.25
Total	48	100

Table 145. Preparedness Survey – Question 27

Does your organization have strong disaster management leadership?	*Frequency*	*Percent*
No	9	18.75
Yes	35	72.92
I don't know	1	2.08
Does not apply	1	2.08
Missing	2	4.17
Total	48	100

Table 146. Preparedness Survey – Question 28

Do you think your organization has an effective disaster management program?	*Frequency*	*Percent*
No	11	23
Yes	26	54
I don't know	5	10.5
Does not apply	2	4
Missing	4	8.5
Total	48	100

Annex B: Definitions of Disaster Management

Participant responses to Preparedness Survey Question 29: "How do you define effective disaster management?" are included in Table 147.

Table 147. CDM Preparedness Survey Participant - Written Responses

Opportune and adequate response when an emergency occurs, and being able to help the largest population possible
It is the preparation of the necessary means to attend to a disaster.
The management was XXX (illegible) all of the stages of the risk with the designated means (personal – material and budgetary).
Articulation of resources with planning, projects and financing
Effective management of the emergency, meaning during the response and rehabilitation
Opportune and integral response, Prevention, reduction, preparation and rehabilitation in the face of emergencies
Suggesting adequate measures for opportune assistance in the face of meteorological disasters
Development of actions to prevent, reduce, prepare and rehabilitate in the face of situations of emergency disasters
Actions that are carried out in all of the XXX (illegible) and moments necessary to protect the life, health and well-being of people in the face of disaster.
Dissemination and communication
It should be with an early warning, XXX (illegible) response and to save lives
Service to the greatest amount of the population provided with the best quality service/help in the least amount of time possible
It is the package of processes planned with participatory budgeting.
with the human, technical and financial resources to adequately manage the disaster risk management plans
Planning, organization, articulation, and execution in attending to a disaster.
An action coordinated with the management of specialized personnel
Carry out activities that generate a rapid and opportune response that is appropriate for mitigating the effects of the disaster
Opportune and efficient management in the assistance provided in the disaster
It should be coordinated, opportune, pertinent (based on needs that are adequately evaluated), efficient, effective, with adequate standards and approaches (rights, sustainability), and transparent (accountable)
Process of preparation and response with a support for prevention in the face of situations of risk that operate in the face of a natural disaster or a disaster created by humans, and that affects the sustainability of the population and its assets.
It is management that is planned in advance, to be prepared in such a way that if it occurs, it can be done in a professional way.
Actions of XXX (illegible) and XXX (illegible) that make possible an adequate response in the face of the occurrence of a disaster.
Rapid and adequate response
Adequate preparation, Immediate and opportune response, Quick rehabilitation
A preparation and response that is capable of saving lives (the most possible) **Protect livelihoods to the extent possible in an opportune way**

That which gives an opportune response in the face of the occurrence of a disaster.
Satisfy the needs in the topic, whatever they may be.
It is the actions carried out in order to provide support to the victims of a disaster.
Efficient disaster management is due to having information and at the opportune time, for an efficient management.
Rapid action for XXX (illegible) results
Immediate action in order to XXX (illegible) the population.
Reduction of risks, Analysis of threats / scenarios, Population is informed and organized (government)
Opportune actions to serve the population
It is a process for the XXX inter-XXX actors with XXX (illegible) capacities in preventing or mitigating disaster risks
Pertinent and opportune, Includes the opinion of those who have been affected.
Application of plans that have been previously designed. In the case plans don't exist, work with information, collecting it keeping in considering institutional coordination and coordination / participation with the community / population.
It is management that allows for responding in the most adequate way and in the least amount of time possible.
It is a social process for the reduction, prevention of risks, and attending to disasters, taking into account political, economic and social factors.
Reduction of loss caused by disaster in an opportune way and with the greatest cost-benefit possible
A successful process in which you have achieved the execution of the plans in an adequate way and that the communities of the intervention have felt there has been a contribution
Preparation of plans of action in a simple way, about XXX (illegible) and assistance
When the response to a disaster has assured a dignified and sustainable life for the population.
Optimal, opportune and immediate management with an efficient use of resources and processes in the three levels of government (national, regional and local) in the face of a disaster or emergency, making possible the least amount of impact on the vulnerability of people and their livelihoods.
Actions that allow for returning to normalcy.
The proposition for giving a rapid, effective response in the least time possible in a disaster
Provide opportune assistance to the population and to the opportune re-establishment of services

Appendix D: CDM Response Survey (July 2014)

Introduction

As part of Comprehensive Disaster Management (CDM) data gathering efforts, stakeholder participants completed a response survey during the Midterm Knowledge Exchange in Lima, Peru, on 15 July 2014. The survey explored a variety of aspects pertaining to disaster response activities within the country. Questions were focused on, but not limited to, resources and capacity building, damage and needs assessments, staffing, roles and responsibilities during disaster response operations, early warning system usage, the existence of mutual-aid agreements, response partnerships and collaboration, and the operationalization of Emergency Operations Centers. The survey was organized into two sections – a quantitative portion (questions 1-25) and a qualitative portion (questions 26-30). Frequency tables for responses to survey questions 1-25 can be seen in Tables 149-173 contained in Annex C of this document.

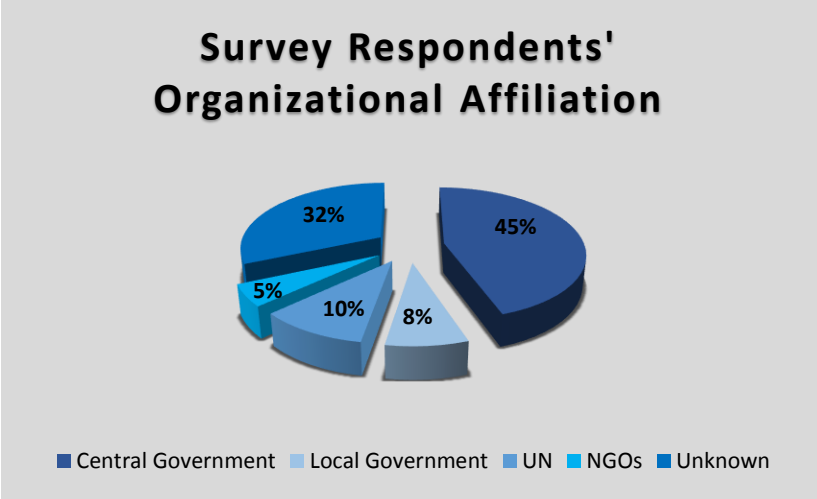

Figure 123. Organizational Affiliation of Respondents

A total of 38 stakeholders participated in the survey, with 45% representing central government agencies, 8% from local government, 10% from the United Nations, and 5% from NGOs. Nearly one-third of participants (32%) chose not to list their organizations. Respondents were 61% male and 34% female with the balance not identifying their gender. Approximately 32% of respondents were between the ages of 51-60, 26% were 41-50, 16% were 31-40, 8% were 26-30, 3% were 18-25, and the remaining 5% chose not to identify their age.

Survey responses were consistently validated by stakeholder interviews conducted by PDC staff throughout the project. Interview participants came from provincial and national governmental organizations and NGOs, and included leaders and specialists.

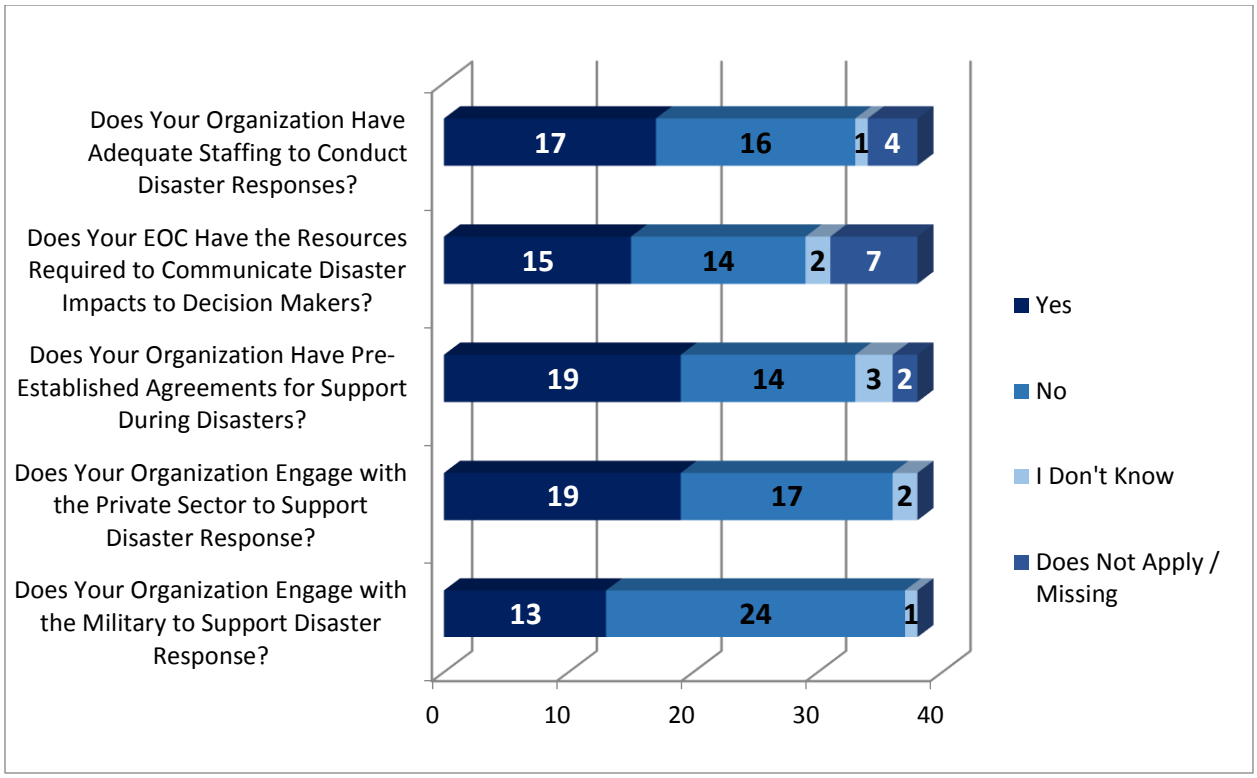

Figure 124. Key Resourcing Survey Results

Quantitative Section (Questions 1-25)

Effectiveness of Recent Disaster Event Response

Out of 38 survey participants, 63% (24/38) reported that their organizations are active in disaster response. When asked about the effectiveness of the response during the last major disaster, only 32% (12/38) of respondents deemed it effective. Almost half of those surveyed (45%; 17/38) felt the mobilization of resources and response personnel was ineffective during the last disaster. According to survey responses, only 21% (8/38) felt that evacuations were effectively executed, 8% (3/38) believed sheltering was executed effectively, 13% (5/38) believed emergency medical response efforts were effective, and 29% (11/38) were of the opinion that search and rescue agencies responded effectively. While most survey responses highlighted the need to improve the effectiveness of disaster response activities, nearly two-thirds of respondents (61%; 23/38) stated that their organizations responded to the last major disaster as outlined in their policy and governing documents.

Disaster Early Warning

Half (50%; 19/38) of the respondents to the survey reported that their organizations provide disaster early warning to communities. Nearly three-quarters (71%; 27/38) of respondents receive hazard warning messages directly from the lead agency. Only about a fourth of respondents (26%; 10/38) felt disaster information messages were effectively issued during the last major disaster, with more than twice this number (58%; 22/38) stating that they were not effectively issued.

Organizational Resources and Capacity Building for Disaster Response

As mentioned above, approximately roughly two-thirds of respondents (63%; 24/38) identified their organizations as being active in disaster response activities. Half of those surveyed (19/38) stated that their organizations have pre-established agreements for support, such as mutual-aid agreements, during times of disaster. Half of the respondents (19/38) also reported that their organizations engage with the private sector for such support. Only 34% (13/38) of respondents indicated that their organizations engage with the military to support disaster response.

Two-thirds (66%; 25/38) of those surveyed stated that their organizations have training programs to help develop and increase disaster management capacity among staff members. But fewer than half (45%; 17/38) of respondents felt their organizations have adequate staffing to conduct disaster response.

Post-Disaster Damage and Needs Assessments

Sixty-three percent (24/38) of those surveyed indicated their organizations are responsible for post-disaster damage and needs assessments, and 66% (25/38) reported that post-disaster damage and needs assessments were conducted following the last major disaster. Despite 90% (34/38) of respondents stating that they find post-disaster damage and needs assessments helpful in decision-making, only about one-quarter (24%; 9/38) of respondents felt that the findings of the assessments were accurate.

Emergency Operations Centers

Nearly three-quarters of survey respondents (74%; 28/38) indicated that their organizations maintain Emergency Operations Centers. Yet only 40% (15/38) felt their Emergency Operations Centers have adequate resources to perform their responsibilities effectively. About one-quarter (26%; 10/38) of the respondents stated that they have representatives from other organizations and agencies participating in their EOCs during a disaster.

Roles and Responsibilities in Disaster Response

Forty-two percent (16/38) of respondents felt disaster response tasks are clearly defined in Peru, while 45% disagreed with this statement. Sixty-one percent (23/38) of those surveyed felt there is overlap and/or conflict between organizations active in disaster response in the country.

Qualitative Section (Questions 26-30)

Questions 26-30 required open-ended responses from survey participants. Respondents generally provided brief answers to these questions, which centered on organizational improvements and challenges to disaster response in Peru.

Thirty-seven (97%) respondents provided an answer to Question 26 ("How do you receive disaster alerts or warning messages?"). The most prevalent method of communicating disaster alerts and early warning messages was by telephone calls. Text messages and emails were also used. Additional methods included mobile applications, the Internet, early warning systems, and direct communication from the COEN.

Question 27 ("What was the last major disaster that required your organization to respond?") was answered by 97% (37/38) of survey respondents. The most common response was the Pisco earthquake of 2007, flooding in Loreto, followed by a landslide in the Chosica area, volcanic eruptions, and freezing events. Other responses included extreme temperatures in 2013, oil pipeline leaking, various international responses, and snowfall.

Figure 125. Word Cloud for Question 30: "In your opinion, what is the greatest challenge to effective disaster response?"

Seventy-nine percent (30/38) of respondents answered Question 28 ("In your opinion, in what disaster was your organization's response most effective?"). The majority of respondents believed their organizational response to the Pisco earthquake was most effective, with landslides in the Huaycoloro area also cited as examples. Flood events and general earthquake responses were mentioned, with several respondents replying they did not know which disaster elicited the most effective response from their organization(s). Providing resources quickly was the most often cited reason for the efficient response, followed by coordinated response, preparedness activities that the organization undertook prior to the disaster, and communities recovering and becoming more resilient.

Twenty-five (66%) respondents provided an answer to Question 29 ("In your opinion, in what disaster was your organization's response least effective?"). The most prevalent answers for the least effective response included the Pisco earthquake, the Ubinas Volcano, El Niño and various landslides. Lack of coordination was the reason most often cited for a less effective response, followed by a lack of, or late arrival of, personnel and resources, lack of awareness at the community level and multiple organizations gathering the same information.

Question 30 ("In your opinion, what is the greatest challenge to effective disaster response?") was answered by 97% (37/38) of survey respondents. Responses overwhelmingly referenced a lack of adequate resources (see Figure 124) – human, financial, and material – as well as inadequate communication and coordination among agencies. Additional challenges included a lack of information, the need for greater training and capacity building, and limited public awareness and preparedness.

Annex C: Frequency Tables for CDM Response Survey (Questions 1-25)

Table 148. Response Survey – Question 1

Is your organization active in disaster response?	*Frequency*	*Percent*
No	9	23.7
Yes	24	63.2
I don't know	0	0
Does not apply	3	7.9
Missing	2	5.3
Total	38	100

Table 149. Response Survey – Question 2

Does your organization provide disaster warning to the community?	*Frequency*	*Percent*
No	14	36.8
Yes	19	50.0
I don't know	1	2.6
Does not apply	4	10.5
Missing	0	0
Total	38	100

Table 150. Response Survey – Question 3

Do you receive hazard-warning messages directly from the lead agency?	*Frequency*	*Percent*
No	7	18.4
Yes	27	71.1
I don't know	0	0
Does not apply	2	5.3
Missing	2	5.3
Total	38	100

Table 151. Response Survey – Question 4

In your opinion, was the response to the last major disaster effective?	*Frequency*	*Percent*
No	17	44.7
Yes	12	31.6
I don't know	3	7.9
Does not apply	3	7.9
Missing	3	7.9
Total	38	100

Table 152. Response Survey – Question 5

In your opinion, were disaster information messages issued effectively during the last disaster?	*Frequency*	*Percent*
No	22	57.9
Yes	10	26.3
I don't know	3	7.9
Does not apply	2	5.3
Missing	1	2.6
Total	38	100

Table 153. Response Survey – Question 6

In your opinion, were emergency evacuations executed effectively during the last disaster?	*Frequency*	*Percent*
No	18	47.4
Yes	8	21.1
I don't know	6	15.8
Does not apply	4	10.5
Missing	2	5.3
Total	38	100

Table 154. Response Survey - Question 7

In your opinion, was emergency sheltering effective during the last disaster?	*Frequency*	*Percent*
No	18	47.4
Yes	3	7.9
I don't know	6	15.8
Does not apply	8	21.1
Missing	3	7.9
Total	38	100

Table 155. Response Survey – Question 8

In your opinion, were the emergency medical response efforts effective during the last disaster?	*Frequency*	*Percent*
No	17	44.7
Yes	5	13.2
I don't know	6	15.8
Does not apply	8	21.1
Missing	2	5.3
Total	38	100

Table 156. Response Survey – Question 9

In your opinion, were the Search and Rescue agencies' response efforts effective during the last disaster?	*Frequency*	*Percent*
No	9	23.7
Yes	11	28.9
I don't know	6	15.8
Does not apply	10	26.3
Missing	2	5.3
Total	38	100

Table 157. Response Survey – Question 10

In your opinion, was the mobilization of resources and response personnel effective during the last disaster?	*Frequency*	*Percent*
No	17	44.7
Yes	12	31.6
I don't know	5	13.2
Does not apply	2	5.3
Missing	2	5.3
Total	38	100

Table 158. Response Survey – Question 11

Does your organization have pre-established agreements for support during times of disaster (i.e., Mutual-aid)?	*Frequency*	*Percent*
No	14	36.8
Yes	19	50.0
I don't know	3	7.9
Does not apply	1	2.6
Missing	1	2.6
Total	38	100

Table 159. Response Survey – Question 12

Is your agency responsible for post-disaster damage and needs assessments?	*Frequency*	*Percent*
No	13	34.2
Yes	24	63.2
I don't know	1	2.6
Does not apply	0	0
Missing	0	0
Total	38	100

Table 160. Response Survey – Question 13

Were post-disaster damage and needs assessments conducted following the last major disaster?	*Frequency*	*Percent*
No	4	10.5
Yes	25	65.8
I don't know	6	15.8
Does not apply	1	2.6
Missing	2	5.3
Total	38	100

Table 161. Response Survey – Question 14

In your opinion, were the post-disaster damage and needs assessments conducted after the last major disaster accurate?	*Frequency*	*Percent*
No	17	44.7
Yes	9	23.7
I don't know	6	15.8
Does not apply	3	7.9
Missing	3	7.9
Total	38	100

Table 162. Response Survey – Question 15

Do you find the results of post-damage and needs assessments helpful in response decision making?	*Frequency*	*Percent*
No	2	5.3
Yes	34	89.5
I don't know	0	0
Does not apply	2	5.3
Missing	0	0
Total	38	100

Table 163. Response Survey – Question 16

Does your organization maintain an Emergency Operations Center?	*Frequency*	*Percent*
No	7	18.4
Yes	28	73.7
I don't know	0	0
Does not apply	0	0
Missing	3	7.9
Total	38	100

Table 164. Response Survey – Question 17

Do you have representatives from other agencies and organizations in your Emergency Operation Center?	*Frequency*	*Percent*
No	22	57.9
Yes	10	26.3
I don't know	1	2.6
Does not apply	5	13.2
Missing	0	0
Total	38	100

Table 165. Response Survey – Question 18

In your opinion, does your Emergency Operations Center have the necessary resources required to communicate the impacts of a disaster to decision makers (e.g., maps, status boards, decision support software, etc.)?	*Frequency*	*Percent*
No	14	36.8
Yes	15	39.5
I don't know	2	5.3
Does not apply	5	13.2
Missing	2	5.3
Total	38	100

Table 166. Response Survey – Question 19

In your opinion, does your organization have adequate staffing to conduct disaster response?	*Frequency*	*Percent*
No	16	42.1
Yes	17	44.7
I don't know	1	2.6
Does not apply	4	10.5
Missing	0	0
Total	38	100

Table 167. Response Survey – Question 20

Does your organization have a training program to help develop and build capacity in disaster management staff members?	*Frequency*	*Percent*
No	11	28.9
Yes	25	65.8
I don't know	0	0
Does not apply	1	2.6
Missing	1	2.6
Total	38	100

Table 168. Response Survey – Question 21

In your opinion, are disaster response tasks clearly defined?	*Frequency*	*Percent*
No	17	44.7
Yes	16	42.1
I don't know	0	0
Does not apply	1	2.6
Missing	4	10.5
Total	38	100

Table 169. Response Survey – Question 22

In your opinion, is there overlap and conflict between organizations active in disaster response?	*Frequency*	*Percent*
No	10	26.3
Yes	23	60.5
I don't know	1	2.6
Does not apply	0	0
Missing	4	10.5
Total	38	100

Table 170. Response Survey – Question 23

Does your organization engage with the military to support disaster response?	*Frequency*	*Percent*
No	24	63.2
Yes	13	34.2
I don't know	0	0
Does not apply	1	2.6
Missing	0	0
Total	38	100

Table 171. Response Survey – Question 24

Does your organization engage with the private sector to support disaster response?	*Frequency*	*Percent*
No	17	44.7
Yes	19	50.0
I don't know	2	5.3
Does not apply	0	0
Missing	0	0
Total	38	100

Table 172. Response Survey – Question 25

In your opinion, did your organization respond to the last major disaster as outlined in policy/governing documents?	*Frequency*	*Percent*
No	7	18.4
Yes	23	60.5
I don't know	4	10.5
Does not apply	2	5.3
Missing	2	5.3
Total	38	100

Appendix E: Key SINAGERD Disaster Management Legislation

Table 173. Key SINAGERD Disaster Management Legislation (Current as of August 2015)

Nº	DOCUMENT	APPROVAL MECHANISM
1	Law creating the National System of Disaster Risk Management (SINAGERD).	Law Nº. 29664 FEB.09, 2011 **PUBLISHED**
2	Regulation of the Law Nº 29664.	Supreme Order Nº. 048-2011-PCM **PUBLISHED** MAR. 26,2011
3	Mechanisms of Constitution and function of the Working Groups for Disaster Risk Management.	Ministerial Resolution Nº. 276-2012-PCM **PUBLISHED** OCT. 25, 2012
4	Device that incorporates the National Policy on Disaster Risk Management as an obligatory National Policy for the Institutions of the National Government.	Supreme Order Nº 111-2012-PCM **PUBLISHED** NOV. 02,012
5	Guidelines that define the framework Responsibilities of Disaster Risk Management of State entities at all three levels of government.	Ministerial Resolution Nº 046-2013-PCM **PUBLISHED** FEB.16, 2013
6	Guidelines for Organization, Establishment, and Operation of Civil Defense Platforms.	Ministerial Resolution Nº 180-2013-PCM **PUBLISHED** JULY. 11, 2013
7	International Humanitarian Assistance in case of Major Disasters.	Ministerial Resolution Nº 0292-2013-PCM **PUBLISHED** NOV. 11, 2013 approving the Order Nº 001-2013-PCM/SINAGERD
8	Directive "Internal Guidelines for the Conduct of Earthquake and Tsunami drills by Nationwide."	Departmental Resolution Nº 080-2014-INDECI ABR. 16, 2014
9	Directive "Guidelines for conducting Earthquake and Tsunami drills by Nationwide."	Departmental Resolution Nº 081-2014-INDECI ABR.18, 2014 approving the Order 05-2014-INDECI/10.3
10	National Plan for Risk Management Disasters-SINAGERD	Supreme Order Nº 034-2014-PCM **PUBLISHED** MAY.13, 2014
11	Communication Mechanisms and diffusion: Development, validation, approval, and distribution of press releases.	Departmental Resolution Nº 093-2014-INDECI MAY 06, 2014 approving the Order 07
12	Higher Education Program Preparedness and Disaster -PESPAD-INDECI.	Departmental Resolution Nº 101-2014-INDECI MAY.19, 2014
13	Directive Nº. 008-2014-INDECI / DR (11.0) "Implementation and Organization of the Rapid Intervention Group for Emergencies and Disasters - GIRED INDECI."	Departmental Resolution Nº 122 -2014-INDECI JUNE. 13, 2014
14	Conceptual Framework Process Preparedness, Response and Rehabilitation Management in Reactive - Framework Volunteer Emergency and Rehabilitation.	Departmental Resolution Nº 199-2014 -INDECI OCT. 21, 2014
15	Further standard declarations of state of emergency or disaster imminent danger.	Supreme Order Nº 074-2014-PCM **PUBLISHED** DIC. 20, 2014

16	National Community Education Plan.	Departmental Resolution Nº 021-2015-INDECI FEB.25, 2015
17	Guidelines for the Organization and Operation of Emergency Operations Centers - COE.	Departmental Resolution Nº 059-2015-PCM **PUBLISHED** MARCH. 26, 2015
18	Approval of the execution of "National and Regional Simulations Drills 2015".	Ministerial Resolution Nº 087- 2015-PCM **PUBLISHED** ABR02, 2015
19	Guidelines for the implementation of SAP-Standing Service Alert.	Ministerial Resolution Nº 172- 2015-PCM **PUBLISHED** JUL11, 2015
20	Guidelines for the Performance and Organization of the National Early Warning Network - RNAT and the Formation, Function and Strengthening Early Warning Systems - SAT.	Ministerial Resolution Nº 173- 2015-PCM **PUBLISHED** JUL11, 2015
21	Guidelines for the implementation of the Reactive Processes Management.	Ministerial Resolution Nº 185.2015-PCM **PUBLISHED** AGOST11, 2015
22	Guidelines for the formulation and adoption of contingency plans.	Approved with Ministerial Resolution Nº 188-2015-PCM. **PUBLISHED** AGO13, 2015
23	Guidelines for the establishment and operation of the Volunteer Emergency and Rehabilitation - VER.	Ministerial Resolution Nº 187-2015-PCM. **PUBLISHED** AGOST 13, 2015