

RECEPTION RISK ASSESSMENT FOR THE IMPROVEMENT OF SOLID WASTE MANAGEMENT IN MARCONA - NAZCA – ICA 2022

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INTRODUCTION

Peru, being a megadiverse country, has a geographical configuration conducive to the diversity of altitudinal floors, climates and species, it is also innate to assume that the varied configuration places not only the population to be susceptible to a variety of phenomena but also the infrastructure and services of a certain area, which is why it is imperative to empower ourselves with mitigation and/or prevention measures in order to coexist with the phenomenological manifestations with adequate management so that they do not lead to disasters, assuming that the phenomena have to develop but that we have to learn to reduce the risk of disaster.

For the research carried out, the phenomenology of Peru of internal geodynamic classification is addressed, specifically with reference to earthquakes and tsunami whose scenario is the coastal strip of our country in a pre-investment context, that is, before the execution of a project, being the case the risk assessment in a reception context that refers to the reception area of the sanitary landfill of the project: "Integral Improvement of Solid Waste in the district of Marcona, province of Nasca, department of Ica" C.U.I 2167778 in accordance with the legal regulatory framework Ministerial Resolution 334-2012-PCM and Chief Resolution 112-2014-CENEPRED/J that approves the "Manual for the Assessment of Risks originated by Natural Phenomena - 2nd version" it is necessary to assess the risk of earthquakes with a projection to a tsunami warning, for this purpose it is necessary to analyze evaluation parameters and susceptibility (conditioning factors) and triggers of the phenomenon or danger, the vulnerability of elements exposed to the phenomenon in relation to fragility and resilience is analyzed in order to determine and zone the levels of risks and the formulation of recommendations related to the prevention

and/or reduction of risks in the geographical area under evaluation.

The objective of the research is: To determine the risk levels due to the danger of earthquakes with a tsunami cascade effect in the reception area of the projection area of the sanitary landfill in the district of Marcona, province of Nazca, Ica region. applying the technical procedure of Risk Analysis, based on the Technical Guidelines of the Disaster Risk Estimation Process.

MATERIALS AND METHODS

The method is multi-criteria because it is a process where the analysis is hierarchical with mathematical support, in order to consolidate quantitative information from field measurement work and qualitative because virtual platforms such as CENEPRED's SIGRID are used, as well as all scientific and management instruments related to risk management.

The project implementation material refers to the use of the Arc Gis software to capture the contents established in the Saaty matrices and express in a georeferenced way the danger, vulnerability and risk of the land where the Marcona sanitary landfill will be implemented.

RESULTS AND DISCUSSION

Risk assessment in response to the recurrence of natural phenomena is regulated by the National Center for Disaster Risk Estimation, Prevention and Reduction - CENEPRED; however, it is imperative to identify the phenomenology to apply the established methodology as referred to by Muñoz, J (2022). When the evaluation process is applied to an area where a project is to be carried out, it is necessary to issue a technical opinion of acceptance taking into account the population benefited, but the evaluation specifies the project area, unlike applying

it to an established population and that it is necessary to identify its danger, vulnerability and risk, that is, it is divergent in its application but maintains the multicriteria methodology within the technical guidelines.

Regarding the qualitative information, it was possible to collect scientific studies that express the impacts that the population of Marcona had during the earthquake that affected the south of Peru as detailed by the report of the National Institute of Civil Defense - INDECI (1996) where it is demonstrated that the major damages were given in the population of Nazca that presented 18 690 victims compared to Marcon Land Phology. On the other hand, it is established according to the studies that our territory is part of the Pacific Ring of Fire as detailed by Kuroiwa, J (2002) for which there is an earthquake danger, then the study expressed by Tavera, H (2014) is considered, dedicating one of its sections to the presence of tsunamis in Peru that occurred between 1868 and 2014, which is the date of publication, stating in these antecedents that there is no presence of tsunami in the port of San Juan de Marcona, the limit of the flood zone does not reach the population, therefore it would not reach the area destined for the sanitary landfill in a possible event, finally, in the qualitative data, the use of the Information System for Disaster

Risk Management - SIGRID platform, it was feasible to establish the social and economic dimension of the population of Marcona, considering age groups, housing material and the conditions of basic services such as water and electricity.

In refraining from quantitative information, we worked with the Saaty matrix giving value to the criteria established from the information collected from the qualitative information, at this stage it was necessary to carry out surveys of the population on the reception, knowledge and expectation that the project of a sanitary landfill had for the district, this survey was useful to build the parameters of the environmental dimension.

The multi-criteria methodology revealed in the hazard matrices considering the elements exposed and triggers, for vulnerability the social, economic and environmental dimensions, consider exposure, fragility and resilience to finally establish the danger due to earthquake.

CONCLUSION

It is concluded taking into account the level of danger and vulnerability to establish the risk in a georeferenced way from the matrices, establishing a high level for the land destined for the sanitary landfill before an earthquake, this being mitigable.

CONDITIONING FACTORS	GEOLOGY	EARRING	GEOMORPHOLOGY	NORMALIZATION MATRIX				PRIORITIZATION VECTOR
GEOLOGY	1000	3.000	4.000	0.632	0.692	0.500	-	0.608
EARRING	0.333	1.000	3.000	0.211	0.231	0.375	-	0.272
GEOMORPHOLOGY	0.250	0.333	1.000	0.158	0.077	0.125	-	0.120
ADDITION	1.58	4.33	8.00	1.000	1.000	1.000	-	1000
1/SUM	0.63	0.23	0.13					

Table 1. Saaty matrix referring to the danger in the event of an earthquake.

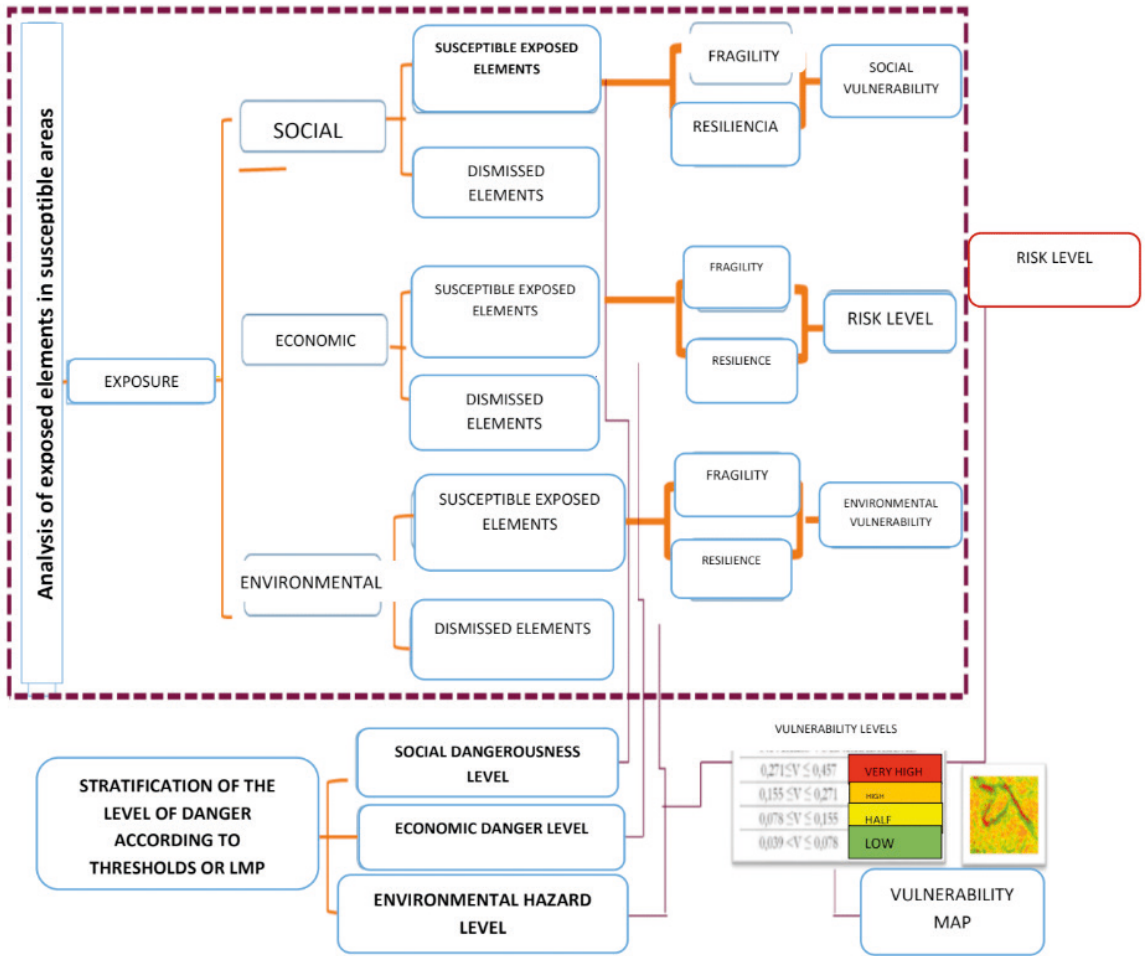
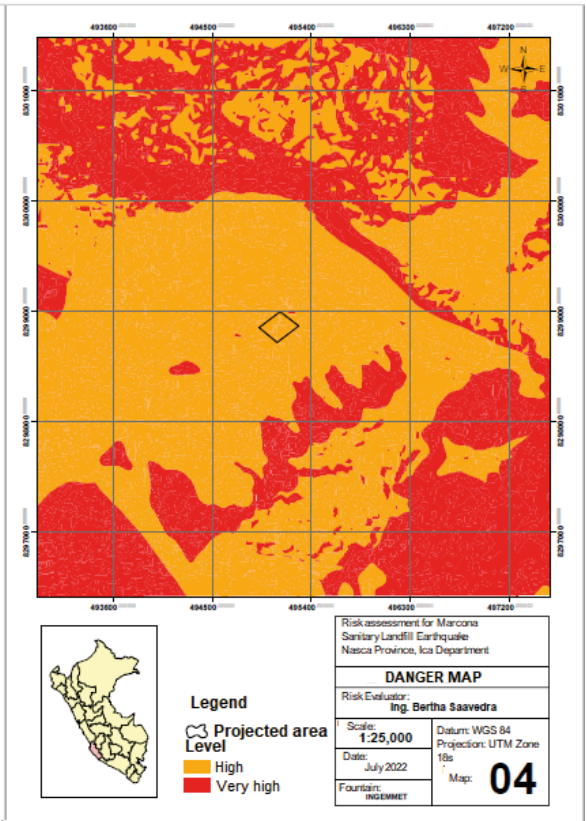
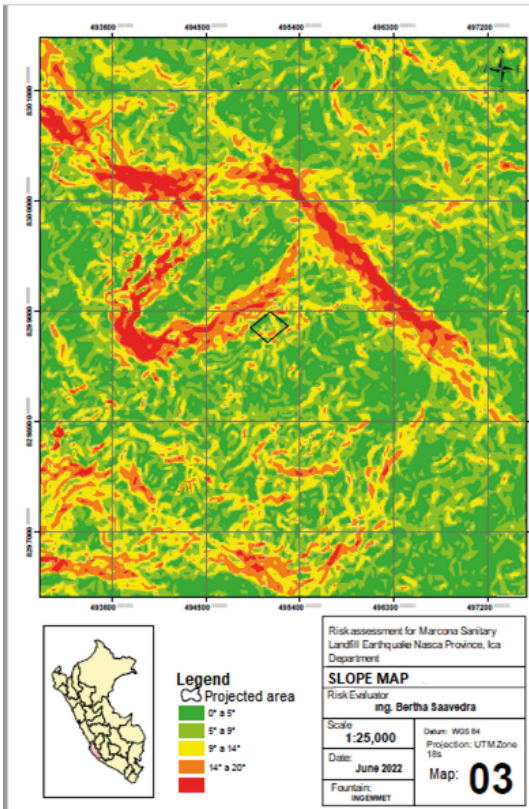
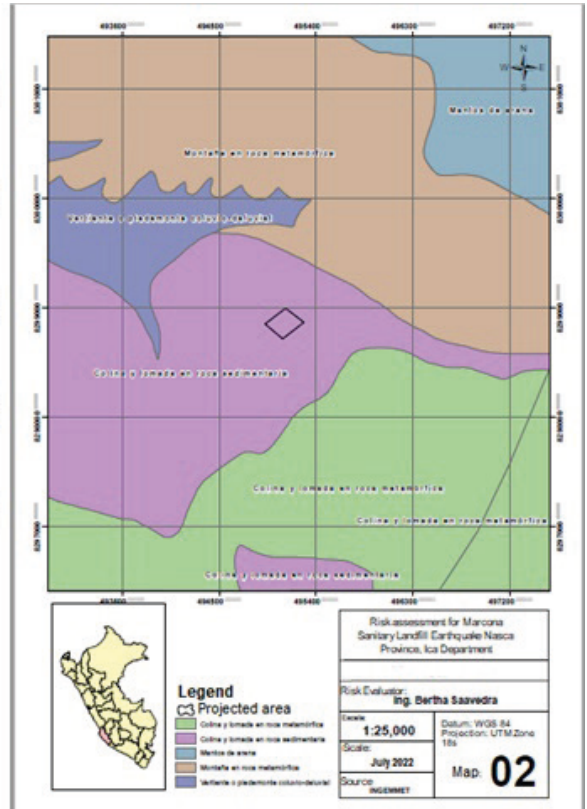
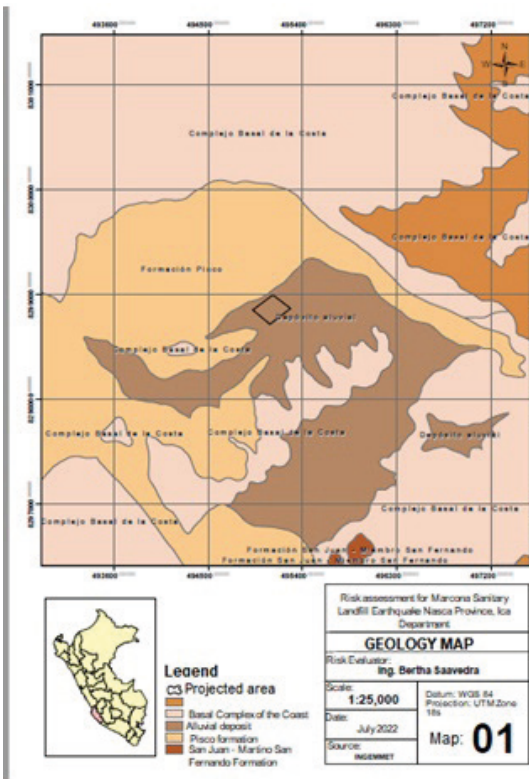


Figure 1, Vulnerability Methodology.

	Social Vulnerability	Economic Vulnerability	Environmental Vulnerability	Total vulnerability value
	0.519	0.480	0.449	0.483
	0.263	0.259	0.245	0.256
	0.137	0.143	0.241	0.140
	0.079	0.077	0.081	0.079
	0.042	0.041	0.045	0.043
Average	0.208	0.200	0.192	0.200

Table 2. Saaty matrix regarding vulnerability to earthquakes

Source: self made



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