# *HOW TO STRENGTHEN PREPAREDNESS FOR A FUTURE NATURAL DISASTER*

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Not only does climate change mean an increase in temperatures, but also a significant increase in a marked increase in climate variability with the increasingly common occurrence of extreme weather events in unusual areas and for short periods of time [1].

Although it is practically impossible to avoid damage, good risk management can minimize the effects of natural disasters. However, their analysis and prediction is complex. In this sense, and in order to improve the capacity to respond to the increasing risks of natural disasters, response capacity to the growing risks of catastrophes and their adverse effects, [2] establishes the need to develop a series of early warning principles as essential elements, as well as prevention, mitigation and preparedness measures in the face of potential disasters. All this in an attempt to increase the capacities for action of administrative and organizational systems in the event of a disaster and, in this way, try to reduce the adverse impact of disasters on the economy, society and health situation.

Although much of the research is aimed at dealing with the aftermath of natural disasters, rather than at developing methods to mitigate and prepare for the event, it is worth mentioning the work of [3] whose objective is the design of a simulation model to obtain a measure of the "Degree of Preparedness" in the process of disaster risk management at the level of an autonomous community. This study presents such a model, based on system dynamics, in order to raise awareness of the problem of the social and economic impact of this type of physical phenomena. The aim of this simulation model is to provide information on the situation four months before the disaster. Therefore, two simulations are implemented and the results are compared by applying them to the context of the of the Filomena squall (a natural disaster that took place in Spain on January 7, 2021) in order to validate its usefulness in a real case study.

In the first simulation, real data associated with the policies, reports and descriptions of the community of Madrid during the 120 days prior to the event according to certain variables within the Sendai risk reduction framework (forecasting errors, CO2 emissions, recycling and commodity index prices). With that, the "real" value of the "Degree of Preparedness" obtained by the capital city before the occurrence of the storm. In the second simulation, several input variables of the model are modified to analyze the effect it would have had on the "Degree of Preparedness".

Therefore, by strengthening preparedness for future natural disasters, we will be able to increase response capacity. The impact and losses caused by a disaster can be reduced by strengthening the regulatory, technical and institutional capacity for regional, national or local management, preparing coordinated regional approaches and improving operational policies. While each natural disaster will be represented by very different characteristics, and even at the autonomous community level, the simulation model is presented as a decision support tool in the area of risk management.

In short, its design could be of particular interest for the study of environmental and sustainability-related problems, as these require a dynamic, long-term perspective that integrates social, economic and environmental factors.

## REFERENCES

[1] Botzen, W., Duijndam, S., van Beukering, P. (2021). Lessons for climate policy from behavioural biases towards COVID-19 and climate change risks. World Development, 137, 105214. DOI: https://doi.org/10.1016/j. worlddev.2020.105214
[2] ONU UN-SPIDER. (2006). Space-based information for Disaster Management and Emergency Response. DOI: https://www.unspider.org/es/riesgos-y-desastres
[3] Caro-Carretero, García Caro, F. Simulation of the level of preparedness in a future natural disaster. Case study Filomena. DYNA Energía y Sostenibilidad, Jan.-Dec.2022, vol. 11, no. 1, [12P.]. DOI: https://doi.org/10.6036/ES10572.


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