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Research Article

Disaster Risk Reduction Networks in the Literature From 2020 to 2023

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Abstract

The UN-Habitad in its report corresponding to 2023 and in its section related to Municipal Strategies for Comprehensive Disaster Risk Management (EMUGIRDE) recommends eight phases related to: identification, forecasting, prevention, mitigation, preparation, aid, recovery reconstruction in order to establish the comprehensive process of public administration and civil participation in the face of risks. The objective of this paper is to review the literature corresponding to Comprehensive Disaster Risk Management (GIRD) in the COVID-19 era. A documentary, cross-sectional, exploratory and retrospective study was carried out with a selection of indexed sources, considering the search by keywords, as well as the analysis period from 2020 to 2023. The results show the convergence of civil participation within the framework of Objectives of Sustainable Development (SDG) and the GIRD. In relation to the literature consulted and reviewed, it is recommended to extend the work to other official sources.

Keywords: covid-19; gird; sdgs; civil participation; drr

Introduction

Comprehensive Disaster Risk Management in the COVID-19 era assumes the impact of pandemic mitigation and containment policies on the rest of the public administration and citizen participation at different levels and areas, considering eight intervention phases that range from from risk identification to reconstruction of the affected system, institution, community or group (Holland et al., 2021). In this risk control and management scenario, communication is substantial because it impacts the risk perception of affected groups and human communities. In this way, the epidemiological traffic light regulated the anti-pandemic strategies, but it also affected the GIRD.

As the pandemic intensified, mitigation and containment strategies were exacerbated (Jerrett et al., 2023). In the case of the use of anti-COVID devices such as face masks, alcohol gel, hand washing or gloves, they affected the GIRD because they went beyond resilience. Communities, groups and individuals, before the pandemic, were used to managing their disaster risks based on interaction, association and proximity. Now, the epidemiological traffic light limited these uses and customs and even modified them by recommending some mediating technology between humans.

In relation to the SDGs, the pandemic went through each of the objectives and modified them because contingencies were not considered as a guiding principle for public policies and civil participation (Wroten, 2021). This is the case of the management of natural and human resources. Before the pandemic, risks such as threats to impact the quality of life and the increase in resilient communities and groups were managed, but once the pandemic was established, relationships of trust between humans changed. In fact, the trust that persists is towards technology but not towards the public administration or civil organizations.

The GIRD agenda is no longer solely based on the SDGs, international agreements or community resilience (Ria et al., 2020). In addition, learning from the pandemic has fostered social knowledge that permeates the relationships between political civil actors, public and private sectors. The governance of the GIRD is already a real proposal that needs to be discussed, specified and specialized from the new sciences and humanities.

The SDGs and the GIRD have Disaster Risk Reduction (DRR) as their guiding axis. The Kobe, Hyodo (Japan) Disaster Risk Summit highlights community resilience as a paramount goal (Mujica, 2020). If human groups and settlements participate in civil protection policies, then they will anticipate disaster risks.

Precisely, the objective of this work is to put into dialogue the existing sources that refer to the SDGs, civil participation and resilience, as well as the GIRD. The pandemic modified the trust between the parties involved, as well as the systems, in such a way that it is now pertinent to establish the axes and topics of discussion that open up before the distancing and confinement of people.

Are there significant differences between the SDGs and the GIRD disseminated in the literature from 2020 to 2023 for DRR with respect to the evaluations of expert judges in the field?

The premises on which this work is based indicate that the pandemic affected the parties involved in DRR asymmetrically (Solari, Maestre & Sebastián, 2022). In this way, the confinement and distancing strategies will impact the relationship of trust and resilience between the parties involved. Therefore, significant differences are expected between the SDGs, GIRD and DRR in the literature with respect to the evaluations of the expert judges.

Method

cross-sectional, exploratory and retrospective study was carried out with a selection of 30 sources indexed to institutional repositories such as Latindex, Redalyx and Scielo, considering the search by key acronyms: ODS, GIRD, DRR and COVID in the observation period that goes from 2020 to 2023.

Expert judges on the subject of Earth summits, civil protection and pandemics were selected (Álvarez et al., 2021). They were notified of the objectives of the study, as well as those responsible for the project. The confidentiality and anonymity of their answers in relation to their professional and employment status was guaranteed in writing. Focus groups were held in order to standardize the concepts.

The data was captured in Excel and processed in Matlab version 10 (López-Feldman et al., 2020). The centrality coefficients were estimated in order to be able to contrast the hypothesis of interconnectivity between the informative nodes, as well as the grouping parameters to establish the axes of analysis of the nodes. The neural network was calculated to be able to demonstrate the degree of learning relative to the RRD. Values close to unity were assumed as evidence of non-rejection of the null hypothesis of significant differences between the RRD reported in the literature with respect to the evaluations of the expert judges.

Results

The centrality coefficients notice the intermediate relationships between the central nodes with respect to the peripheral nodes or input and output layers. The importance of estimating betweenness consists in the topographic establishment of the clusters and their interaction. In this way, the centrality values indicate that the interactions between the criteria of the judges reflect the proximity of the central nodes, but distant from the peripheral nodes. This observation is common in disaster risk management systems that are about to consolidate disaster risk reduction. As the pandemic fluctuated between being out of control and being managed, stakeholders distanced themselves from risk reduction (see Table 1).

Variable	Betweenness	closeness	Strength	expected influence
Garcia	-0.271	0.629	1,454	0.632
hernandez	0.829	1,453	1,280	0.923
spinoza	-0.051	-1,374	-0.018	0.584
aguilar	-0.930	-1,409	-0.172	0.614
Aldana	-0.710	-0.059	-0.387	-1,203
valdes	-0.051	0.167	0.049	0.034
Cordova	-0.930	-1,641	-0.216	0.537
gonzalez	0.389	0.508	0.706	1,181
Corner	2,807	1,121	-0.089	-2,388
ornelas	-0.271	0.489	-0.996	-0.021
mill	-0.930	-0.720	-1,731	-0.144
Ruiz	0.169	0.049	-1,266	-1,044
Sources	-0.051	0.789	1,386	0.293

Table 1: Centrality of DRR with respect to the SDGs and the IRMD in the literature from 2020 to 2023

Source: Prepared with study data

The grouping values of the central and peripheral nodes indicate that the GIRD and the SDGs allow DRR from the convergence of indicators and factors that relate them asymmetrically. In other words, the selected and evaluated literature is structured in groups that allow risk reduction to be distinguished from management and based on objectives, but risk reduction is modified or fragmented between the input and output layers. The prevalence of the GIRD is appreciated more than that of the SDGs and the DRR (see Table 2).

Variable	Barrat [a]	Onnela	WS[a]	Zhang
aguilar	0,000	-0.999	0,000	1,344
Aldana	0,000	0.310	0,000	-0.921
Cordova	0,000	-0.896	0,000	1,429
spinoza	0,000	-0.796	0,000	0.917
Sources	0,000	1,008	0,000	0.548
Garcia	0,000	1,128	0,000	0.537
gonzalez	0,000	0.928	0,000	-0.819
hernandez	0,000	1,126	0,000	0.318
mill	0,000	-1,724	0,000	-0.593
ornelas	0,000	-0.913	0,000	-0.699
Corner	0,000	0.834	0,000	-1,610
Ruiz	0,000	-0.525	0,000	-1,110
valdes	0,000	0.520	0,000	0.661
[a] Coefficient could not be standardized because the variance is too small.				

Table 2: Clustering of DRR with respect to the SDGs and IRMD in the literature from 2020 to 2023

Source: Prepared with study data

The structure of the relationships between the evaluative nodes suggests that risk reduction is considered as the axis of risk management and the achievement of sustainability objectives. In particular, the criteria of the

judges oscillate between nullity or carelessness to the bias of considering risk reduction as the primary objective. In this sense, the mitigation and containment of the pandemic fostered the distancing that allowed political and social actors, public and private sectors to establish risk management oriented from sustainability objectives, but with divergences when deciding between the risk reduction or rather risk communication focused on their perception (see Table 3).

Variable	Garcia	hernandez	spinoza	aguilar	Aldana	valdes	Cordova	gonzalez	Corner	ornelas	mill	Ruiz	Sources
Garcia	0,000	0.893	0.079	0.112	-0.433	0.595	0.115	0.473	-0.163	-0.093	0.009	-0.138	0.912
hernandez	0.893	0,000	0.133	0.129	-0.103	0.441	0.114	0.574	-0.358	-0.111	0.164	0.022	0.860
spinoza	0.079	0.133	0,000	0.977	0.167	-0.063	0.976	0.044	-0.278	0.012	-0.039	0.265	0.025
aguilar	0.112	0.129	0.977	0.103	0,000	-0.031	0.981	0.036	-0.254	-0.007	-0.018	0.251	0.058
Aldana	-0.433	-0.103	0.167	0.103	0,000	-0.256	0.046	0.160	-0.174	0.363	0.391	0.113	-0.508
valdes	0.595	0.441	-0.063	-0.031	-0.256	0,000	-0.085	0.259	0.244	0.145	0.030	-0.341	0.611
Cordova	0.115	0.114	0.976	0.981	0.046	-0.085	0,000	0.054	-0.263	0.015	0.018	0.200	0.061
gonzalez	0.473	0.574	0.044	0.036	0.160	0.259	0.054	0,000	-0.210	0.555	0.528	0.279	0.357
Corner	-0.163	-0.358	-0.278	-0.254	-0.174	0.244	-0.263	-0.210	0,000	0.390	-0.207	-0.377	-0.093
ornelas	-0.093	-0.111	0.012	-0.007	0.363	0.145	0.015	0.555	0.390	0,000	0.432	0.036	-0.262
mill	0.009	0.164	-0.039	-0.018	0.391	0.030	0.018	0.528	-0.207	0.432	0,000	-0.053	0.053
Ruiz	-0.138	0.022	0.265	0.251	0.113	-0.341	0.200	0.279	-0.377	0.036	-0.053	0,000	-0.171
Sources	0.912	0.860	0.025	0.058	-0.508	0.611	0.061	0.357	-0.093	-0.262	0.053	-0.171	0,000

Table 3: Structuring of DRR with respect to the SDGs and the IRM in the literature from 2020 to 2023Source: Prepared with study data

Discussion

The contribution of this work to the state of the art lies in the establishment of central axes and themes of the SDGs, the GIRD and the DRR in a pandemic scenario. The concomitant management and resilience of stigma and mistrust between stakeholders reflects the impact of the pandemic on civil protection systems (Brandes et al., 2020). As the pandemic intensified, civil protection was oriented towards distancing and confinement rather than civil participation (Eyeberu et al., 22021). Furthermore, risk management that is based on trust has moved into a realm of speculation of contagion, disease and death from COVID-19. Under these sanitary conditions, civil protection systems had to innovate in risk communication, as well as damage control (Afroz, Schwarbe & Bhuiyan, 2021). Even once the immunization of personnel reached the lack of confinement, recommended by the green color of the epidemiological traffic light, the stigma towards the authorities began to reverse, trust in technology increased and the attribution of responsibility increased (Abd Ur Rehman et al. al., 2021). In this scenario of speculation, risks, threats and contingencies, uncertainty redefined the relationships between political and social actors, as well as between the public and private sectors (Luthar, Ebbert & Kumar, 2021). Corporate governance fostered an identity scenario that outlined risk management in civil protection institutions and organizations (Sarango et al., 2023). To the extent that the reputation and image of the risk-controlling and communication entity increased, risk reduction shaped a social representation of the pandemic and disaster risks in general (Hernández, Rodríguez & García, 2023). The figurative nucleus of attribution of responsibility and stigma towards the authorities would be centered, grouped and structured on the prevalence of risk communication rather than on their reduction. The difference is substantial, the authorities occupy their efforts and resources in disseminating the idea of territorial security, but not in the prevention, control and management of risks.

Conclusion

The objective of the study consisted in the establishment of the learning neural network from the dialogue between the theoretical structure and the evaluations of expert judges. The results show the prevalence of risk communication more than perception or risk reduction. In other words, the investigative agenda revolves around distrust of the authorities in terms of data, images, and arguments for risk control, damage, and reconstruction. The health, economic and environmental crisis requires comprehensive risk management, but the communication of the phenomenon prevails over any other process. In this sense, it is recommended to extend the study towards risk communication, mainly in the central or peripheral persuasion route in order to be able to evaluate civil protection systems in their identification phases until risk reconstruction.

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