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Risk Communication and media interventions in disaster risk management – contributions from two practical experiences in Brazil

Comunicação de riscos e intervenções midiáticas na gestão de riscos de desastres – contribuições de duas experiências práticas no Brasil

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Abstract: Disasters intensification was exacerbated by climate change and structural inequalities, which require effective communication strategies to strengthen resilience and enhance society's response capacity. Accordingly, the aim of the current study is to investigate the theoretical and conceptual foundations of interconnections between risk communication and media interventions, and their contributions to disaster risk management (DRM) improvements in Brazil. The theoretical framework encompasses studies in risk communication, perception and media interventions fields. The methodology includes a literature review based on the theoretical framework and a case study on two unprecedented experiences in the country: the GIRD+10 project and the process to develop the first National Civil Protection and Defense Plan (PN-PDC). The findings reinforced the understanding that risk communication goes beyond the mere outspread of information to integrate participatory practices, transparency and adaptation in messages to different audiences and sociocultural contexts. The diversity of communication strategies adopted in both initiatives supported the multipliers' engagement, ensured clarity in planned actions' implementation and reinforced the perception that DRM policies have indeed been developed in the country. This study highlights the need for guidelines to ensure these practices effectiveness, with emphasis on continuous training, campaign monitoring and broader access to reliable information.

Keywords: risk communication; media interventions; DRM; PN-PDC; GIRD+10.

Resumo: A intensificação dos desastres, agravada pelas mudanças climáticas e desigualdades estruturais, exige estratégias comunicacionais para fortalecer a resiliência e ampliar a capacidade de resposta da sociedade. Nesse contexto, este artigo visa investigar os fundamentos teórico-conceituais da interconexão entre comunicação de riscos e intervenções midiáticas (media interventions), assim como sua contribuição para potencializar a gestão de riscos de desastres (GRD) no Brasil. A fundamentação teórica abrange os estudos no campo da comunicação e percepção de riscos e das intervenções midiáticas. A metodologia compreende revisão da literatura nas áreas do referencial teórico e estudo de caso de duas experiências inéditas no país, o projeto GIRD+10 e o processo de elaboração do primeiro Plano Nacional de Proteção e Defesa Civil (PN-PDC). Os resultados reforçam o entendimento de que a comunicação de riscos vai além da mera disseminação de informações ao integrar práticas participativas, transparência e adaptação de mensagens a diferentes públicos e contextos socioculturais. A diversidade de estratégias comunicacionais adotadas nas duas iniciativas examinadas favoreceu o engajamento dos multiplicadores, garantiu a transparência nas ações programadas e a percepção de que há políticas de GRD em curso no país. O estudo ressalta a necessidade de diretrizes que assegurem a efetividade dessas práticas, com destaque para a capacitação continuada, o monitoramento de campanhas e o acesso ampliado à informação confiável.

Palavras-chave: comunicação de riscos; intervenções midiáticas; GRD; PN-PDC; GIRD+10.

1. Introduction

Disasters intensification in Brazil reflects the global climate crisis worsening and social vulnerabilities scenarios. The country has experienced increasingly frequent and severe extreme events such as wildfires, floods, landslides and prolonged drought, in recent years. These events have been having negative impact on millions of people, besides generating substantial economic losses. Data from the Digital Atlas of Disasters in Brazil by the National Secretariat of Civil Protection and Defense (Sedec) have disclosed that Brazil recorded approximately 72.000 disasters between 1991 and 2024, and it resulted in 5.448 deaths, in more than 10.7 million displaced and homeless people, and in 1.7 million injured and ill individuals Centro de Estudos e Pesquisas em Engenharia e Defesa Civil, 2025).

The worsening of extreme events is closely related to climate changes in the vast majority of cases, as well as to lack of proper risk management infrastructure. A survey carried out by the federal government at the Growth Acceleration Program (PAC) scope identified 1.942 Brazilian municipalities living under high susceptibility to disasters, mainly to landslides, flash floods and floods – this scenario terrifies approximately 35% of the country's municipalities (Léon, 2024). These events' consequences are worsened by socioeconomic inequality, which has disproportional impact on populations living under extreme socio-environmental vulnerability situations.

The historic floods in Rio Grande do Sul back in 2024 stand out among the most recent and large-scale disasters. They destroyed infrastructure and disrupted essential services and mostly affected rural communities that depend on agriculture. This disaster's social consequences were broadly widespread, and they had impact on the physical and psychological health of the affected population, a fact that still needs to be thoroughly investigated. A year earlier, in February 2023, intense rains caused landslides that left dozens dead and hundreds homeless on the Northern São Paulo State coastal region. The severe 2023 and 2024 drought in Amazonas State compromised river transport, water supply and agricultural production, which had straight effect on riverside and indigenous communities. Wildfire events reached record levels in 2023 in Brazil Central-Western and *Cerrado* regions. The number of hotspots was two times larger in comparison to the previous year in these regions due to prolonged drought and uncontrolled deforestation.

Climate change is known for interfering with these disasters' escalation. Studies have shown that increase in mean global temperatures amplified both drought severity in the Brazilian Northeastern region and the frequency of extreme hydro-meteorological events in the country's Southern and Southeastern regions (Intergovernmental Panel on Climate Change [IPCC], 2023). The 2023 Sixth Assessment Report of the Intergovernmental Panel on Climate Change, also known as IPCC, is a warning on the intensifica-

tion of heat waves, tropical storms and extreme rainfall events, which had straight effect on coastal megacities, river deltas and riverside communities.

Thus, risk communication plays key role in reducing the vulnerability of populations exposed to disasters, not only by enabling the outspread of reliable information, but also because of its potential to boost social engagement in community resilience promotion. However, the way risks are communicated remains a challenge, whether due to lack of clarity in the outspread messages or to disconnection between the information outspread and local realities (Victor et al., 2024).

According to IPCC (2023), overly alarmist communication can lead to social paralysis and to feelings of ineffectiveness in face of risks, whereas negligent approaches tend to underestimate imminent dangers, which compromises the population's response. Accordingly, it is imperative to adopt communication models aimed at avoiding both extremes. Therefore, it is essential using accessible language and clear messages, and making use of multiple platforms to broaden information reach, engage different audiences and make disaster prevention messages effective.

This reality justifies the aim of the current article, namely: analyzing the interconnection between risk communication and media interventions as strategy to strengthen disaster governance in Brazil. This proposal is based on a literature review on this topic and on the analysis of two study cases that have adopted these strategies: the Integrated Disaster Risk Management (GIRD+10) project, which is an initiative focused on training and engaging society in disaster prevention and mitigation; and the National Civil Protection and Defense Plan (PN-PDC), known as milestone in the National Civil Protection and Defense Policy structuring process.

The relevance of this study lies in the need for increasing the visibility of communication initiatives in the disaster risk reduction field and for better understanding how media interventions can help strengthening resilience, mainly through the engagement of Disaster Risk Management (DRM) multipliers in the country. The goals is to show these approaches potential to democratize the access to information, encourage social participation and improve decision-making processes focused on addressing socio-environmental disasters in Brazil by articulating risk communication concepts and practices through media intervention strategies.

2. Risk communication and media interventions – theoretical contributions

The present authors adopted the founding risk communication concepts to set connections with media interventions, mainly in the risk management context. This methodological choice does not disregard epistemological updates in risk communication; it merely sets the limits for a given theoretical-conceptual perspective to underpin the discussion.

Risk communication, as research practice and interdisciplinary field, gathers contributions from social and cognitive psychology, economics, sociology and social communication. However, there is consensus on the understanding that this concept refers to an information-sharing process focused on risks. One of the most widely accepted definitions in academia was proposed by the American Vincent Covello (1992), who is acknowledged as pioneer in this field. He describes it as "the process of exchanging information about the nature, magnitude, significance or risk control between stakeholders" (p. 359, our translation).

Most approaches tend to follow a similar logic; they present variations that highlight specific elements like the relevance of dialogue between communicators and stakeholders (Palenchar, 2005), the need for continuous monitoring (Coombs, 2012) and risk management (McComas, 2006). Conceptual formalization still guiding studies in this field; it emerged from the National Research Council of the United States, which defined risk communication as:

> Interactive process of exchanging information and opinions among individuals, groups and institutions. It involves multiple messages about the nature of risk, and messages [...] about risk that express concerns, opinions or reactions to risk messages or to legal and institutional risk management plans (Stern & Fineberg, 1996, p. 27; our translation).

Fischhoff (1987) nominated himself as one of the pioneers in formulating a specific approach to risk communication based on the original research developed by, and on perceptions from, Slovic et al. (1981). This theoretical perspective has been progressively refined since his initial contributions and it gained conceptual and methodological consistency, as well as broad acceptance by the scientific community. Several researchers have reinforced the premise that risk communication must take into consideration the different ways different social groups perceive risk, since this is strongly influenced by sociocultural contexts. The media is known as one of the main agents in mediating these perceptions within this process, since it plays active role in building the collective meaning given to 'risks'.

From a pragmatic perspective, Willis and Okunade (1997) stated that risk communication takes place whenever the media, mainly the news media, broadcasts existing, imminent or potential dangers that could compromise the health or safety of these massages' recipients. The reference to health risks also encompasses "physical, emotional or mental state of individuals who assimilate these events accounts" (Willis & Okunade, 1997, p. 1; our translation). According to these authors, journalism has the capacity to sensitize and raise public awareness, or to positively or negatively distort the perception of risk, depending on the presented representations. Therefore, the media can accurately show the risks without causing panic

in the public, or ignore and minimize real risks and, in doing so, transmit a fake sense of well-being (Willis & Okunade, 1997).

Based on the book "Reporting on risks: The Practice and Ethics of Health and Safety Communication", Willis and Okunade (1997) argued that it is reasonable asserting that thee news have direct or indirect influence on public behavior regarding the perception of threats. "Research confirms a wide range of such effects; therefore, the media's responsibility for presenting an accurate picture of the problem is vital" (Willis & Okunade, 1997, p. 4).

Another pioneer in this field is Professor Peter Sandman (2009), a psychologist with PhD in Communication who has developed a matrix model to set the guidelines for implementing risk communication principles based on identifying and differentiating four macro-categories of events. So, communication should adopt them to get adapted to the herein addressed risk type:

High risks *versus* apathy: When people are apathetic in face of serious risk; they need to be warned.

Low risks *versus* apathy: When people are apathetic in face of a small risk; they should not be warned.

High risks *versus* high concern: When people are alarmed in face of a high-risk event; they should be guided.

Low risks *versus* high concern: When people are alarmed by a low-risk event, they need to be reassured.

From this perspective, it is essential observing risk communication throughout social construction of risk dynamic cycle, which, based on Borraz's (2014) proposition, has five main stages, as summarized below:

Extraction – A situation must be displaced from its natural context and become object of public concern to be recognized as risk. This displacement often happens after a critical event, such as an environmental disaster or a health crisis, which marks the transition from a latent threat to a perceptible problem.

Projection – The risk is framed in a social and political dispute, and it is contested by different actors. Social movements, experts and the media can amplify the issue and connect it to other risks by giving greater relevance to it.

Specialization – Authorities and experts intervene to technically assess the risk by often shaping the narrative and determining mitigation strategies. Social and political aspects are often reduced to a merely technical approach, at this stage.

Risk assessment – Policies and regulations are set to respond to identified risks, although the focus overall targets institutional management and the reputation of decision-making bodies, rather than the mitigation of risks posed on the population.

Management – Risk is institutionalized, incorporated to continuous

monitoring practices or, in some cases, loses public visibility until a new critical event brings it back (Borraz, 2014).

Communication can play different interconnected roles within these five phases that not only take place in isolation, but coexist (Borraz, 2014) by gathering information production, circulation and reception practices influencing public perception, policy formulation and decision-making in face of risky situations.

The media embodies a core role in turning isolated events, or those limited to specific groups and contexts, into public narratives of risk by giving visibility to latent threats and by determining the risks to be prioritized in the social and institutional debate, at the extraction stage. However, this process is not limited to the media, since civil society organizations, the academia, governmental institutions and community networks also give active contributions to neglected risks' detection and reporting. Institutional communication on risk reduction actions and mapping, for example, can work as this extraction vectors.

Risk is contested by different actors and framed based on specific interests at the projection stage. It is potentially politicized, minimized or amplified, depending on the context. Risk communication, at this point, regards institutional mediation (governmental agencies and experts attempt to set technical guidelines to better understand the risk) and social mediation (which takes place through social movements, social networks and citizen participation mechanisms). Risk ability to consolidate itself as public concern depends on interactions among these different agents and on how communication is set in order to translate technical data into accessible messages.

Risk communication tends to be dominated by technical and scientific discourses at the specialization stage, when experts assess and quantify the threat based on using statistical modeling and probabilistic analyses. Balancing scientific rigor with the need for clarity and accessibility is one the communication challenges faced at this point; it is essential making sure that information is understood by public managers, as well as by the directly affected population. Transparency and civil society inclusion in decision-making is crucial to avoid communication distortions and mistrust in the interpretation of risks.

Communication plays strategic role in legitimizing public policies and response measures at the risk assessment decision-making stage. The messages sent by governments, scientific institutions and the media influence the acceptance or rejection of adopted strategies, as well as the population's willingness to adhere to mitigation and response protocols. Lack of clear and participatory communication can lead to resistance, misinformation or even to adverse reactions, such as distrust in preventive alerts and emergency recommendations.

Finally, risk communication can tap into collective, community and

institutional memory at the risk management stage in order to build resilience. This stage's relevance lies in preventing risk-perception dissipation after a critical event takes place and in making sure that lessons learned on risk-management lead to effective changes. Communication must be an on-going process at this point, and it must happen through education, training and community engagement, as well as through media actions and attention to risks, long before eventual disasters.

According to Victor et al. (2024), it is possible observing that risk communication cannot be reduced to unidirectional information flow throughout all these stages, but rather understood as interactive, dynamic, and politically and institutionally situated process mainly depending on the media, government, civil society, academia and on community networks collaborations, altogether. This risk cycle reinforces the understanding that risk communication effectiveness is closely related to its ability to be accessible, transparent and responsive to the different audiences involved. Therefore, the possibility for social participation and for the construction of more inclusive and effective disaster risk management policies is broadened, and it will be discussed in the two herein analyzed case studies.

It is worth noting that risk communication has been assessed in light of risk perception studies, whose main bases are sought out in the psychometric paradigm proposed by Slovic et al. (1985) and developed to identify the psychological variables affecting such perception. The current researchers aimed at featuring and quantifying specific events based on this model to better understand their impact on individuals' perception and behavior. The model by Slovic et al. (1985) uses mental maps to show that individuals perceive situations as safe or risky based on psychosocial contexts associated with the risk itself. Table 1 gathers and details the author's proposition.

Slovic (2000) used the social construction concept to explain the influence of a set of individual perceptions on the process to turn real dangers into risk. In his own words, "risk does not exist out there, regardless of our minds, waiting to be measured", there is no such thing as "real risk" (Slovic, 2000, p. 693). Variables related to voluntariness and familiarity have significant influence on risk-perception construction. Sandman (2009) compared smoking and exposure to chemical agents in food as example of classic voluntariness impact.

Victor (2016) observed the potential possible connection between this field and media interventions risk communication based on the fundamentals, and by paying attention to risk-perception precepts. Media interventions introduced themselves as alternative to their pernicious role in some conflicts that had emerging in the 1980s. It originally responded to armed conflicts and to the UN peacekeeping missions, besides being known not only for directly incite violence, but also for omission, manipulation and the outspread of inconsistent information that scalated tensions or delegitimized certain social groups (Victor, 2016; Victor & Edoa, 2023).

Table 1 Risk perception *versus* context.

Underestimated risk Perception: safe	**Overestimated risk Perception: risky**
Voluntary	Tax
Familiar	Exotic
Natural	Technological
Not very memorable.	Very memorable
Controlled by the individual	Controlled by others
Statistical	Catastrophic
Observable	Non-observable
Recognized by science	Non-recognized by science
Information from reliable sources	Information from unreliable sources
Old	New
Clear benefits	Little or no direct benefit
Fair (moral) distribution	Unfair (immoral) distribution
Responsive process	Unresponsive process

Source: Adapted by the authors Slovic *et al.,* (1985); Lanard, 2004; Sandman, 2012; Rembischevski & Caldas, 2020.

The case of the local broadcaster 'Radio Télévision Libre des Mille Collines (RTLM)' is among the most emblematic ones. It incited ethnic hatred during the 1994 Rwandan genocide. RTLM's harmful actions alerted the international community to the destructive power of mass media and encouraged the incorporation of media interventions as part of the United Nations' peacekeeping strategies. Thus, the first initiatives in this field actually took place in UN peacebuilding missions, and their aim was to counterbalance the actions of local media that, in their turn, incited violence, silenced voices and worsened social tensions (Victor, 2016; Victor & Edoa, 2023).

Media interventions undertaken in the UN missions in Namibia (UNTAG, 1989-1990), the UN Transitional Authority in Cambodia (UNTAC, 1992–1993), the UN Protection Force in the former Yugoslavia (UNPROFOR, 1992–1995) and the UN Assistance Mission in Rwanda (UNAMIR, 1993–1996) stood out among pioneering examples. They all integrated communication actions targeting peacemaking (Betz, 2004). The operation in Namibia[1], in particular, is a landmark. It used its own media and civic education programs to raise public awareness of the ongoing democratic process. This strategy was described by Susan Manuel (2004, p. 37) as "the use of civic education and its own media forms to achieve public awareness" within the post-conflict context.

The concept of media intervention refers to using communicative mediations to intervene in a given social, political or cultural reality. These practices remain relatively theoretically unexplored. According to one of

1 The South African Border War, or Namibian War of Independence, involved the struggle for independence from South Africa.

the leading figures in this field, researcher Kevin Howley, this concept remains elusive and theoretically underdeveloped, which hinders its effective and ethical use in communication (Howley, 2013). This author is editor of a seminal collection on this topic, and he defines media interventions as a set of strategies and tactics adopted by several actors, such as artists, political dissidents, minority groups or citizen movements, as well as by dominant groups with commercial or state interests. It regards using the media to influence debates, amplify marginalized voices or guide public narratives. These interventions are often associated with alternative, community or activist media; they oppose the traditional hegemonic media (Howley, 2013).

Thus, media interventions can connect with risk communication practices as strategy to promote social engagement and broaden the diversity of voices and perspectives in the public-media space (Victor & Sulaiman, 2021; Victor et al., 2024). These interventions open room for more plural and inclusive narratives by questioning and seeking to break down oppressive representation structures. However, this concept is not limited to independent or activist initiatives, it also encompasses actions taken by institutional actors, such as state campaigns and large media outlet initiatives (Howley, 2013). According to Victor et al. (2024), media interventions can play strategic role in mobilizing public opinion and promoting social behaviors in these situations, mainly when they are used in public service campaigns and in initiatives aiming disaster risk prevention.

They emerge in peacebuilding and conflict transformation initiatives in the political field, as previously mentioned, as well as in media campaigns aimed at influencing public policy-making. Previous studies have pointed out that the media themselves can act as "active mediator" in situations of great tension either by training journalists for these events' sensitive coverage or by outspreading content to guide public decision-making (Howley, 2013). Howley (2013) highlighted the relevance of "working with the arbitrators", in other words, of guiding journalists to avoid escalating tensions and to promote reconciliation in conflict-ridden societies. When it comes to public and environmental policy, Anita Howarth analyzed the campaigns undertaken by British newspapers in the late 1990s against the introduction of genetically modified food. At this time, the print media actively engaged in the public debate and influenced the governmental agenda (Howarth, 2013).

Media interventions have been employed to ensure visibility and to amplify the voice of culturally, medially, politically and socially marginalized groups in the cultural and community field to fight stereotyping and to reinforce identities. Marjoribanks et al. (2013) described how the media works as resource to strengthen cultural identities and the feeling of belonging to the communityg. They reported an experience in Australia (AuSud Media Project, 2010): a young Sudanese-Australians received journalism training in partnership with universities and a public broadcaster

to become skilled in producing their own narratives and to improve their representation in the national media.

According to the results, this group's great empowerment and professional journalists' increased awareness pointed out media interventions potential to boost inclusion and diversity at the media sphere (Marjoribanks et al., 2013). Similar initiatives took place in different cultural contexts, from community media projects in urban favelas to indigenous communication networks. They always aimed at democratizing communication and at enabling platforms to amplify the voices that are rarely heard in conventional channels.

Telethon is one of the most popular examples of it. This show was created in 1966, in the United States, by comedian Jerry Lewis, in partnership with the Muscular Dystrophy Association (DMA). According to Van den Bulck et al. (2013), this show is a specific form of media intervention aimed at public mobilization and at building solidarity with people with disabilities. These authors argue that this initiative type acts as media intervention by promoting narratives focused on engaging the public in concrete donation actions. According to them, although Telethon helped to raise funds and visibility, it also raised questions about the role of the media in producing social meanings and about the limits among assistance, spectacle and citizenship (Van den Bulck et al., 2013). Telethon was adapted in other countries, such as in Brazil, in 1998, when it gained a version recorded by SBT channel in partnership with the Association for Assistance to Children with Disabilities (AACD).

Educommunication[2] practices can be understood as media interventions mobilizing means like school radios, social networks and participatory theaters to engage students and communities in topics of public interest (Santos et al., 2016).

Helipa na Ciência[3] project was conceived in Brazil by the Humanitarian Journalism and Media Interventions (HumanizaCom)[4] research group. It exemplifies how media literacy practices are also media intervention forms. *Helipa na Ciência* connected young people from Heliópolis neighborhood, the largest favela in São Paulo, with scientists from several knowledge fields. High school and university students living in Heliópolis produced

2 Educommunication refers to the field of study and practice that articulates education and communication with the aim of promoting more participatory, critical and dialogical educational processes, valuing communicative mediation in the construction of knowledge (Soares, 2000).

3 The Helipa in Science project was developed by the leader of HumanizaCom, Cilene Victor, and the young leader from Heliópolis, João Victor. Funded by Serrapilheira, the project lasted eight months.

4 Created in 2018, HumanizaCom is a research group coordinated by Professor Cilene Victor, within the scope of the Postgraduate Program in Social Communication at the Methodist University of São Paulo (UMESP). The group has conceived and implemented projects and initiatives that connect risk communication and media interventions.

a series of six shows broadcast on 'Rádio Heliópolis' after free courses in voice-over, scriptwriting and interviewing taught by 'HumanizaCom' researchers. The addressed topics were defined based on the interests of the community itself, including science and periphery, health and well-being, climate change, right to the city, food security and pollution (Victor & Edoa, 2023). This project addressed issues such as scientific denialism and misinformation in the science field by proposing new mediation forms between scientific knowledge and popular wisdom.

Overall, whenever media, including digital social media, is intentionally used to inform and empower the public on social, health, citizenship or rights issues, for example, it can be featured as media intervention oriented towards the common good (Victor et al., 2024). Thus, research and projects developed at the HumanizaCom scope have explored the media interventions/risk communication intersection potential, which is the current study's core topic. This is justified by the fact that Effective Disaster Risk Management (DRM) demands infrastructure and contingency plans, as well as communication strategies capable of engaging several sectors, directly or indirectly involved with this topic. Risk communication experiences have already shown that the media can inspire, educate, present solutions and develop actions necessary to reduce disaster risks by fostering a preparedness and resilience culture whenever it is properly mobilized (Victor et al., 2024).

It is possible adapting risk messages to the cultural realities of each territory through community radio, non-industrial journalism outlets, social media and podcasts by fighting misinformation and by making risk communication more accessible and reliable. The convergence of these two field can make the dialogue among communities and their leaders, scientists and public administrators easier, and help overcoming the simplistic understanding, according to which, risk communication plays the role of simply translating technical knowledge into everyday language (Victor et al., 2024).

According to Victor et al. (2024), combining risk communication principles and fundamentals with media interventions tactics is a way to significantly improve communication strategies focused on disaster risk prevention and mitigation in Brazil. It is because this combination helps achieve and strengthening the sense of belonging in risk decision-making of all segments, mainly communities.

3. Case studies – GIRD+10 and the National Civil Protection and Defense Plan

The herein adopted case study allows an in-depth investigation of the research object and takes into consideration its complexity and context in order to better understand the involved social, cultural and institutional

dynamics. According to Yin (2015), case studies are particularly useful when one seeks to answer "how" and "why" questions, mainly in situations demanding the assessment of objects embedded in contemporary life, as it is the case of disaster risk management.

The risk communication/media interventions combination has been applied in DRM initiatives to help achieving effective social participation and engagement, which is the primary condition for reducing disaster risks in Brazil. This strategy exceeds conservative practices and the mere understanding that risk communication is the final DRM stage put in place through decision-making outspread (Victor et al., 2024).

This section introduces two recent and unprecedented initiatives in Brazil, namely: GIRD+10 and PN-PDC, which were chosen as case studies for integrating risk communication fundamentals and media–intervention resources. Their selection is justified by the incorporation of elements discussed in the specialized literature, such as participation and social engagement, transparency, qualified information, messages adaptation to audiences, communication format diversity and risk management issues inclusion in social media methodologies and strategies.

These two initiatives were developed based on the International Technical Cooperation BRA/12/017 framework – Project Strengthening the Culture of Disaster Risk Management in Brazil between the United Nations Development Program (UNDP) and the Ministry of Integration and Regional Development (MIDR). It had the National Secretariat for Civil Protection and Defense (Sedec) as general supervisor.

Each of them relied on different research institutions to develop technical-scientific activities, including HumanizaCom, as presented below. It is important to mention that one of the present authors worked at both Gird+10 and PN-PDC, and it allowed a closer analysis of the research object, but, yet, respecting the scientific rigor of the choice made.

3.1. GIRD+10

The GIRD+10 project – Improvement and Updating of Technical-Operational Content and Pedagogical Proposal for Risk and Disaster Management in the Brazilian Context – was developed between 2020 and 2021 at the International Technical Cooperation BRA/12/017 scope. The project was coordinated by Siades Institute – Environmental Information System for Sustainable Development – and joined two academic institutions: Federal University of ABC (UFABC) (its Risk Management Laboratory (LabGris) and Methodist University of São Paulo (Umesp) (represented by the *HumanizaCom* research group).

The first GIRD+10 stage consisted of a critical analysis of Sedec communication and training materials, with emphasis on disaster risk management. The institution's database and databases of some state civil defense agencies were used, as well as free access and often cited reference works

on this topic, in Brazil. The research *corpus* comprised 82 documents including manuals, guidelines related to the operational Civil-Defense activities, reports on national and international events, training materials, booklets, brochures and additional free-access reference materials of general interest (Caderno GIRD+10, 2021).

The documents textual and visual language analysis showed significant variations. On the one hand, texts were presented in a report-like graphic layout, but the technical content was poorly connected to reality and mainly focused specialists in the field in question. On the other hand, there were simplified and illustrated texts superficially and behaviorally addressing the topic by using resources that infantilized readership (Caderno GIRD+10, 2021). The textual and visual language analysis of risk communication documents corroborated Victor (2016), who discussed the lack or scarcity of actions in this field to reduce disaster risk based on media interventions precepts and potential.

Lack of documents designed to outspread, share and trigger discussions on digital social media can have at least two interpretations in highly connected societies. At first, an excessive concern with publicizing risk topics is still guided by the sense that it could cause panic; therefore, the topic should be kept away from social media. Later on, it could be the very outcome of lack of understanding about media interventions possibilities and dynamics, which reinforces Victor's observations (2016, p. 53):

> […] The on-going concept of media intervention stems from the sense that the media power can reverse scenarios of suffering, whether resulting from wars and civil conflicts or from climate change. In order to achieve it, the media would have to be seen more as technical tool to outspread large-scale information. The concept of media intervention not only acknowledges the media process in social mobilization processes, but also the relevance of transferring this power to social groups in situations of crisis.

The GIRD+10 Technical Notebook – Integrated Risk and Disaster Management – was developed based on this diagnosis. The project aim was to gather structuring updated technical and operational concepts. This initiative sought to qualitatively boost the debate and train entities involved in the risk and disaster management conduction in Brazil.

The main goal of this publication was to support and guide actions aiming disaster risk management and, consequently, aimed at strengthening the Brazilian National Civil Protection and Defense System (Sinpdec). The GIRD+10 Handbook provides national and international theoretical and methodological frameworks in this field, as well as Brazilian examples and practices. The document is divided into four chapters, as shown in Figure 1.

The final chapter features the 'Beyond Information – Models and Resources for Risk Communication' section, which describes the first time the risk communication/media intervention resources combination was

Figure 1

GIRD+10 Notebook chapter covers. CHAPTER 1 Perspectives on Risk and Disaster Management. CHAPTER 2 Future Outlook and Risk Scenarios in Brazil. CHAPTER 3 Risk and Disaster Reduction. CHAPTER 4 Integrated and Collaborative Actions in Risk Management.

Source: Caderno GIRD+10, 2021 (our translation).

put in place (Victor & Sulaiman, 2021). This combination was based on two goals: increasing the topic's newsworthiness without depending on the press, alone; and seeking channels for the communication and production of collaborative materials for professionals working in the risk management field and for the target audience. "Web stories, podcasts, mini-documentaries and animations are examples of media intervention resources that can be produced, for example, by Civil Protection and Defense for a specific audience, such as communities at risk" (Victor & Sulaiman, 2021, p. 139 – our tanslation).

Contributions from this risk communication/media interventions combination are shown in the GIRD+10 technical notebook and in the several media products of this project aimed at the didactic transfer of dense technical content related to risks and disasters into a more accessible model to all audiences. *Helipa na Ciência* is an example of it, since it reinforces the relevance and educational role of media interventions. The resources mentioned in the publication, namely: web stories, podcasts, video lessons, mini-documentaries and animations, were produced and distributed in the Technical Notebook through QR Code in print and digital formats; they were also organized onto the GIRD+10 Notebook YouTube channel[5]. These same audiovisual resources supported GIRD+10: Integrated Risk and Disaster Management course in distance learning mode, as it is also linked to the project.

These media intervention resources were developed to convey credibility through their content, form, structure and overall composition. There was also the constant concern to neither overestimate nor underestimate the target audience by understanding the audiences and their demands. All productions were attentive to the relevance of fostering a sense of belonging, a plurality of voices, of paying attention to the contexts and the connection of different audiences with the disaster risk management topic.

Web stories introduce a combination of images, videos, text and ani-

5 The GIRD+10 Notebook channel is available at: https://www.youtube.com/@cadernogird8705

mations used to tell stories and share information. They are quite effective at attracting users' attention by offering an easily understandable visual experience. This process makes the use of media interventions through a light, playful and captivating language easier (Figure 2).

Animation is another resource supported by media intervention principles that can reach different audiences (Figure 3). The animation in GIRD+10 used scenarios very close to those experienced by the target audience, such as disasters and debates about risks. In order to do so, it applied the moving drawing, and verbal and sound languages supported by playful resources to outspread the message and reach several audiences, from communities affected by disasters to civil defense technicians. This process creates a larger awareness gradient in risk and disaster management.

The podcast (Figure 4) was split in two series: 'Integrated Disaster Risk Management' and 'Risk Scenarios in Brazil'. They lasted 30 minutes, each, on average. Each podcast episode used light and accessible language, even

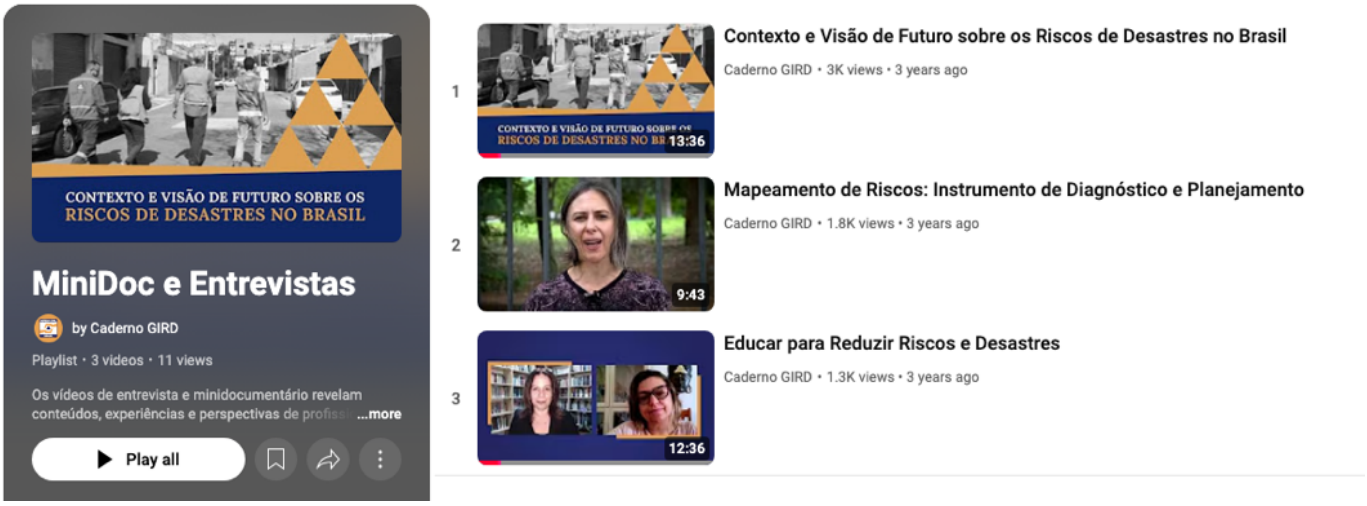
Figure 2
Examples of web stories and their core topics. Presentation of the Technical Handbook GIRRD+10
Webstory
A webstory presents information in the form of a digital narrative.
1. Presentation of the Technical Handbook
Technical Handbook GIRD+10 · 1 video · 1 year ago
2. What does a webstory mean?
Technical Handbook GIRD+10 · 4 videos · 1 year ago
3. Why should we educate to reduce disaster risks?
Technical Handbook GIRD+10 · 5 videos · 1 year ago
4. Nature-Based Solutions
Technical Handbook GIRD+10 · 5 videos · 1 year ago
Source: Caderno GIRD+10, 2021 (our translation).

Figure 3
Examples of the two project animations, one is focused on risk communication models and the other on prevention culture. Disaster Risk Communication *(3:59)*. Better Prevent: Resilience *(2:53)*
Source: Caderno GIRD+10, 2021 (our translation).

Figure 4.
Examples of podcast episode covers for the project. PODCAST Dam Failures and Landslides *(31:33)*. PODCAST Water Crises, Sanitation, and Energy *(21:37)*. PODCAST Chemical Spills and Products *(13:21)* PODCAST Nature-Based Solutions for Disaster Risk Reduction *(25:05)*
Source: Caderno GIRD+10, 2021 (our translation).

during more technical and scientific discussions, and featured the participation of many experts on disaster risk, in Brazil.

GIRD+10 mini-documentaries (Figure 5) used images of risk areas and interviews with professionals in this field who shared their experiences and expectations about disaster risk management in the country.



3.2. National Plan for Civil Protection and Defense

The first National Civil Protection and Defense Plan (PN-PDC 2025-2035) was provided for on law 12.608, from April 10, 2012. It aims at helping to implement the National Civil Protection and Defense Policy, based on its five pillars, namely: prevention, mitigation, preparedness, response and recovery. PN-PDC is substantiated by principles, guidelines, targets, goals, and civil protection performance and defense indicators in the country.

The project to develop the document was substantiated by 11 products or stages. Its elaboration started in March 2023 and finished in December 2024. It was developed at the International Technical Cooperation BRA/12/017 scope, and PN-PDC was technical coordinated by Pontifical Catholic University of Rio de Janeiro (PUC-Rio) in partnership with Oswaldo Cruz Foundation (Fiocruz), State University of Rio de Janeiro (UERJ) and Methodist University of São Paulo (Umesp).

Five participation types were set to ensure the effective involvement of all Sinpdec segments in the PN-PDC development process, namely:

1. Informative;
2. Data provision;
3. Simple consultation;
4. Mandatory consultation;
5. Proactive.

There were eight participation forms, in total:

1. social media and official PN-PDC portal;
2. questionnaires;
3. semi-structured interviews;
4. technical meetings and gatherings;
5. virtual meetings;

Figure 5

Covers of mini-documentaries and interviews. Context and Future Outlook on Disaster Risks in Brazil. Mini Documentary and Interviews *By Caderno GIRD+10. Short videos of interviews and documentary footage present content and perspectives related to disaster risk reduction.*

1. Context and Future Outlook on Disaster Risks in Brazil

Caderno GIRD+10 · *13:36 · 3 years ago*

2. Risk Mapping: A Diagnostic and Planning Tool

Caderno GIRD+10 · *9:43 · 3 years ago*

3. Educating to Reduce Disaster Risks

Caderno GIRD+10 · *12:36 · 3 years ago*

Source: Caderno GIRD+10, 2021 (our translation).

Figure 6

Integrated Plan for Dissemination, Risk Communication and Media Interventions structures.

SOURCE: Centro de Estudos e Pesquisas em Engenharia e Defesa Civil, 2025 (our translation).

6. in-person *workshops*;
7. feedback; and
8. validations.

Accordingly, participatory process activities conducted in 2023 and 2024 reached 4.282 people in 1.187 municipalities (Victor et al., 2024).

The PN-PDC development project included an Integrated Plan for Dissemination, Risk Communication and Media Interventions to ensure the participatory process effectiveness. This Communication Plan was conceived as a set of tactics based on risk communication and media interventions to set and enable multiple communication channels and strategies

aimed at making strategic stakeholders adopt a sense of ownership at the creation of the first National Civil Protection and Defense Plan.

The Communication Plan was tailored to the national context to ensure that risk communication was addressed at all National Disaster Risk Management Plan (PN-PDC) stages, actions and initiatives. Its specific features were based on the four-disaster risk communication (DRC) models by Victor (2016): Intra-institutional DRC, Inter-institutional DRC, Media DRC, Media DRC and Community DRC to reinforce risk communication pluralistic nature. Digital platforms and communication campaigns strategic use, journalists' sensitization and the strengthening of collaborative networks were some of the initiatives broadening communication actions reach and effectiveness. Figure 6 details the Communication Plan structure:

Communication was essential for the National Policy for Civil Protection and Defense (PN-PDC) foundation since it ensured the engagement of strategic actors representing several segments of the National System for Civil Protection and Defense (Sinpdec). The broad PN-PDC outspread is one of the main pillars to strengthen risk and disaster management, which aims at guarantee the social engagement necessary to achieve National Policy for Civil Protection and Defense (PNPDEC) effectiveness based on support from multipliers who represent each segment of society.

3.2.1. Digital platforms and social networks

The web portal was the main channel to promote PN-PDC; its content replicated social media, but after appropriate adaptations in language, formats, audiences and multimedia resources. This process integrated media strategy to interact with disaster risk management multipliers; it included:

PN-PDC Official Portal (pndc.com.br) – It provided technical documents like products and their respective executive summaries, interactive maps, conceptual notes and understandable coverage of all events and actions over the participatory process. The portal also helped to provide transparency and visibility to the PN-PDC development project, besides working as repository and record of this participatory-document construction process.

ComunicaPNDC channel on YouTube – It comprises mini-documentaries and videos from National Plan virtual meetings and in-person workshops. It bringing together all the project's audiovisual resources on a streaming platform.

Strategic use of digital social networks – Instagram, LinkedIn and TikTok have been used for collaborative posts and publications aimed at publicizing the results of each stage, events and invitations to join public voting.

Photo gallery and visual narratives – This resource, just like the others, is available on the portal and on social media. It aims at making strategic

actors who attend PN-PDC virtual and in-person events foster a sense of belonging.

3.2.2. Videos, animations and mini documentaries

The production of videos, animations and mini-documentaries about each stage of the project was another pillar of PN-PDC's communication efforts. This content was planned to help achieving the following goals:

Ensuring the broad understanding of technical concepts through interviews with and testimonies from technical team and Sedec team members, and from event participants. It was possible making the language of PN-PDC documents more accessible to different audiences.

Encouraging social engagement through interviews with and testimonies from several actors in the National Union of Consumer Protection Agencies (Sinpdec). It helped encouraging and publicizing the relevance of states, municipalities, civil society organizations, social movements, Nupdecs (Center for the Promotion of Consumer Protection), the academia and other sectors' involvement in the development of the National Policy for the Protection of Consumer Protection (PN-PDC).

Increase risk perception by giving visibility to Sedec, municipalities, states, civil society, international organizations, private entities, academia and Nupdecs practices and initiatives. It helped achieving risk awareness mainly by broadening discussions on this topic and occupying many digital spaces and platforms.

The project's mini-documentaries and videos highlighted the plurality of voices and realities in the country by seeking to trigger a sense of belonging and ways to enhance and improve individuals' involvement in PN-PDC development by representing Brazilian segments and regions.

3.2.3. 'Plano em Pauta' Podcast

Plano em Pauta podcast was conceived to amplify the voices of several Sinpdec (National Union of Civil Protection and Defense Agents) segments that joined the participatory process. The episodes are available on the project's YouTube channel, on ComunicaPNDC and on Spotify, which is a streaming platform. It featured the participation of experts, public managers, civil protection and defense agents, representatives of civil society and Nupdecs (Nuclei for Civil Protection and Defense) who addressed their contributions to, and suggestions for, the PN-PDC (National Plan for Civil Protection and Defense) elaboration.

The podcast stood out for its accessible language and dialogical approach, and opened room for different audiences willing to understand how the first National Civil Protection and Defense Plan was developed, its actions' transparency, partial results and the progress of each of its stages.

Figure 7

Summary of the main actions by the participatory process and the Communication Plan supported by media interventions.

Source: Centro de Estudos e Pesquisas em Engenharia e Defesa Civil, 2025.

3.2.4. Executive summaries

The discussions and results of online and in-person events were published in executive summaries. Each summary comprised 10 pages, on average, and they aimed at reaching a broader audience, besides building records of both PN-PDC participatory process and development, as a whole.

Similarly, executive summaries were elaborated for each of the PN-PDC products or stages. They always focused on language, which must be accessible to different audiences. The goal was to synthesize the theoretical-conceptual and methodological approaches adopted in the products in these documents, as well as the main findings and directions taken for PN-PDC elaboration. These initiatives were essential to consolidate the PN-PDC communication as participatory and on-going process exceeding the mere information outspread. Figure 7 is a summary of the Communication Plan outputs:

It should be emphasized that the communication, participation, engagement, visibility and transparency strategies conceived and adopted in the

drafting of the first National Civil Protection and Defense Plan were based on the risk communication/media intervention resources combination.

4. Fundamentals to build risk management communication strategies and media interventions

Risk communication plays key role in disaster risk management (DRM) because it broadens the public perception of risks, provides transparency, plurality and horizontality to discussions, actions and decision-making, besides enhancing participatory processes that, in their turn, ensure DRM initiatives effectiveness in Brazil.

The GIRD+10 and PN-PDC experiences disclosed how interconnections between risk communication and media interventions can strengthen initiatives, actions, policies and processes aimed at strengthening risk management. Both projects point out the importance of a communication model based on transparency, social engagement and platform diversification to reach different audiences.

These two experiences make it possible to identify guidelines to formulate communication strategies capable of overcoming challenges that have followed GRD programs and initiatives, such as information fragmentation; low political, media and social actions visibility; distrust in competent institutions and timid engagement by strategic actors and GRD multipliers.

4.1. Risk communication: strategies and challenges

Risk communication, as risk management component, should be understood as continuous, dynamic and interactive process exceeding the mere information outspreading. The Brazilian experiences GIRD+10 and PN-PDC point towards the need for adjusting messages to different audiences by taking into account the appropriate communication timing and purpose. It is mandatory to always pay attention to the role played by institutions and multiplier actors.

The following strategies stood out among the used ones:

Using multiple platforms and language diversification: Risk communication needs to be accessible and outspread in different formats. The PN-PDC and GIRD+10 actions prioritized the use of digital social media, podcasts and audiovisual content to make sure that information would reach different audiences by mostly relying on their multipliers.

Strategic stakeholders Engagement in message construction: The experience deriving from the projects has shown that risk communication is more effective when it is built in a participatory manner. Publicizing the two projects' main discussions and findings helped formulate strategies to outspread information about risk management.

Transparency and credibility: Information must be clear, based on technical and scientific knowledge, on local and traditional wisdom, experience,

lived experience, ethics and on speakers' credibility to make the massage effective. The GIRD+10 and PN-PDC programs started from publicizing all the stages that later on resulted in their respective final products.

Difficulty in ensuring communication actions continuity over time, the need for integrating DRM actions among different strategic actors from several regions in the country and the fight against misinformation were the challenges identified in these experiences. The proliferation of false information, not only in the disaster's context, but also in risk management, and the fragmentation of information sources, hindered the construction of risk perception and compromised trust in the institutions conducting the DRM initiatives.

4.2. Media interventions in disaster risk management

Media interventions are an important risk communication approach because they emphasize the strategic use of different media, and their languages and formats, in order to mobilize the society through its multipliers and leaders, in the herein analyzed projects.

The GIRD+10 and PN-PDC experiences have shown that these interventions can enhance perceptions, foster social participation and influence public policies aimed at reducing disaster risks when they are well implemented.

GIRD+10 embodied media intervention elements to foster the disaster risk management participatory nature. The multimedia resources demanded the participation of experts, technicians and community leaders. These initiatives helped strengthening horizontal communication and ensuring that community perspectives were taken into consideration in prevention strategies. Media intervention strategies were applied to encourage strategic actors' active participation in document formulation and to ensure a sense of belonging to PN-PDC (National Disaster Risk Prevention Program) process.

Podcast episodes and videos, for example, were taken as engagement tools in both projects, since these media allowed exploring a whole plurality of voices, adapting content to different audiences and local realities, and broadening risk communication.

Interactive campaigns on digital media and actions on Instagram, Facebook, LinkedIn, TikTok and YouTube not only publicized the projects, their stages and respective results, but also helped giving visibility to disaster risk reduction policies and actions. It challenged the sense (or misinformation) that there are no good practices, programs and policies for disaster risk reduction.

PN-PDC worked closely with the press and communication offices of institutions directly or indirectly involved in it. It also resorted to one of the media interventions principles by adopting the 'solutions journalism and responsible coverage' practice. In order to do so, press releases and aware-

ness-raising actions were elaborated for journalists to promote risk-related stories outside the disaster's context.

One of media interventions main impacts on Disaster Risk Reduction (DRR) is the ability to give visibility for historically silenced groups like marginalized communities, indigenous peoples, *quilombola* communities and populations directly exposed to disaster risks. These voices were represented by multipliers from segments such as civil society entities and Community Protection and Civil Defense Centers (Nupdecs) in the National Program for Disaster Risk Reduction (PN-PDC). They attended interviews, regional meetings (both in-person and online), voting and propositions of guidelines, goals and indicators. Participants brought a wide diversity of experiences and perceptions to the project's participatory process through their territorial representativeness and community recognition. Their contributions were collected, systematized and added to the final PN-PDC document. They influenced the participatory diagnosis and the proposed communication strategies.

4.3. Guidelines to elaborate communication strategies

It was possible to identify guidelines substantiated by risk communication strategies and media interventions applied to risk management based on contributions observed in the PN-PDC and GIRD+10 processes. These contributions did not derive from formalized impact assessments, but resulted from communication products qualitative analysis, participatory stage records and engagement modes of involved audiences. This is a critical reading guided by theoretical frameworks from these two fields. They allowed identifying patterns, updates and limitations. Four examples of guidelines anchored in the risk communication/media interventions are introduced below.

Society active participation: Communication strategies must ensure the involvement of different sectors of society in massages formulation, outspread and reception. Media intervention experiences have shown that increase in the adherence of communities, their leaders and multipliers to the initiatives happens when they see themselves as protagonists in this process.

Use of multiple communication channels: It is essential combining digital media, radio, television, podcasts, journalistic, industrial and non-industrial media, as well as printed materials to make sure that messages reach different audiences. It must be done by paying attention to different levels of access to information.

Ongoing training for communication agents: Journalists, public managers, and community leaders should be regularly assisted to improve their skills in risk communication and media intervention tactics.

Monitoring and strategy assessing: Risk communication effectiveness should be often analyzed to identify potential adjustments and optimiza-

tions in it. Indicators are needed to capture both public perceptions of risks and campaigns effectiveness to create ongoing baselines.

5. Final considerations

Disasters intensification in Brazil and abroad poses significant challenges for risk governance, which turns communication into a core axis for these event's prevention, mitigation and response to. The herein analyzed experiences: GIRD+10 and PN-PDC, have shown that risk communication and media interventions can work as risk governance components, mainly when they are linked to participatory and diversified strategies aimed at the public's engagement.

Although no formal impact assessments were conducted, the projects contributions were analyzed through a qualitative and documentary approach based on participatory stage records, official documents, communication products and implemented engagement strategies. This analysis identified elements of significant progress like increased social listening, strengthened risk perception and content outspread in accessible and multi-channel formats. The consolidation of mechanisms for public consultation and feedback on contributions was observed in the PN-PDC case, for example, and it points towards a more dialogical communication strategy.

The presence of technicians and community leaders in the GIRD+10 program content production was strategic for the embodiment of different perspectives and strengthen communication processes legitimacy. Although there was no direct co-production of materials by communities, their voices were systematized in the final products, which broadened the diversity of viewpoints on GRD.

The experimental nature of media interventions applied to disaster risk governance was another core aspect discussed in the current study. The media can increase awareness of risks and reinforce misinformation and alarmist narratives by influencing perceptions and behaviors. The participatory process mobilized 4.282 multipliers from 1.187 municipalities in the National Disaster Risk Management Plan (PN-PDC) case, and it highlighted the effort to broaden the scope of the debate on risks. This process and its reach were intensified by communication strategies combining in-person and digital actions aimed at achieving more consistent social engagement. These actors' contributions were systematized into the formulation of guidelines, goals and National Plan indicators. Furthermore, it reinforced their role as vectors for reliable information outspread and as concrete expression of citizen participation in the elaboration of public disaster risk governance policies.

The development of communication strategies becomes even more urgent due to the challenges posed by the digital age and the spread of

misinformation. The PN-PDC (National Program for the Prevention and Control of Transparency in Communication) addressed this challenge by establishing transparent communication guidelines based on scientific evidence validated by multiple sources. This experience reinforced the need for continuous training provided to journalists, public managers and community leaders as way to make sure that information about risks is accessible, clear and reliable.

The case analysis also allowed identifying guidelines to strengthen risk communication and the use of media interventions in disaster risk management, including: diversifying communication channels, adapting messages to local realities, strategically using digital media and promoting spaces for listening and talking to society. These guidelines not only increase the effectiveness of information campaigns but also help the development of more inclusive and responsive public policies addressing the needs of the communities most exposed to disaster risks.

The results from the analyzed experiences have shown that risk communication and media interventions are not merely auxiliary instruments in disaster risk management (DRM); they are disaster risk governance components. Strengthening these strategies should be a priority for public managers and other actors involved in DRM. The consolidation of effective, inclusive and participatory communication policies is essential for society to be better prepared to deal with challenges posed by climate change and increasingly frequent and severe disasters.

Accordingly, the current article sought to help broadening the debate on the role of communication in risk management by opening room for reflections and suggestions for guidelines capable of supporting future initiatives in this field. The improvement of communication strategies in association with the conscious and ethical use of media interventions is a powerful manner to change the way society relates to risks and build more effective pathways to reduce vulnerability and strengthen resilience.

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