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Dialogues between scientific and religious institutions on climate disaster risk reduction

Diálogos das instituições científicas e religiosas na redução de riscos de desastres climáticos

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Abstract: This study analyzed the importance of religious institutions in disseminating a culture of climate disaster risk prevention, based on scientific immersions promoted by the National Center for Monitoring and Early Warnings of Natural Disasters (CEMADEN) in partnership with the Interfaith Rainforest Initiative (IRI-Brazil). Since 2022, over 300 leaders have participated in lectures and workshops offered by the CEMADEN Education Program, promoting science issues on the perception of disaster risks through Disaster Risk Reduction for Education and Climate Environmental Education. The study aims to reveal the dialogic educational practices between researchers and religious leaders, considering the impacts of climate change and the potential expansion of knowledge to reduce denialism and encourage prevention and adaptation actions, before and beyond the tradition of post-disaster practices. The activities performed included participatory methodologies such as oral history, the construction of rain gauges, campaigns, and playing serious games regarding disasters, allowing collective reflections on socio-environmental vulnerabilities and adaptation strategies. The results show that joint action between scientific and religious institutions strengthens the community's resilience and extends the reach of information on climate emergency. The research reinforces the need to integrate science, education, and spirituality as complementary strategies to prepare society for the new global climate regime.

Keywords: risk perception; transformative resilience; disaster science; climate environmental education; CEMADEN Education.

Resumo: Este estudo analisou a importância das instituições religiosas na disseminação de uma cultura de prevenção de riscos de desastres climáticos, com base em imersões científicas promovidas pelo Centro Nacional de Monitoramento e Alertas de Desastres Naturais (CEMADEN) em parceria com a Iniciativa Inter-religiosa para as Florestas Tropicais (IRI-Brasil). Desde 2022, mais de 300 lideranças participaram de palestras e oficinas oferecidas pelo Programa CEMADEN Educação, promovendo questões científicas sobre a percepção dos riscos de desastres por meio da Educação para Redução de Riscos de Desastres (ERRD) e da Educação Ambiental Climática. O estudo busca revelar as práticas educativas dialógicas entre pesquisadores e líderes religiosos, considerando os impactos das mudanças climáticas e o potencial de expansão do conhecimento para reduzir o negacionismo e incentivar ações de prevenção e adaptação, antes e além da tradição de práticas pós-desastre. As atividades realizadas incluíram metodologias participativas, como história oral, construção de pluviômetros, campanhas e jogos sérios sobre desastres, permitindo reflexões coletivas sobre vulnerabilidades socioambientais e estratégias de adaptação. Os resultados mostram que a ação conjunta entre instituições científicas e religiosas fortalece a resiliência comunitária e amplia o alcance das informações sobre a emergência climática. A pesquisa reforça a necessidade de integrar ciência, educação e espiritualidade como estratégias complementares para preparar a sociedade para o novo regime climático global.

Palavras-chave: percepção de riscos; resiliência transformadora; ciência de desastres; educação ambiental climática; CEMADEN Educação.

1. Introduction

Latour (2020) argues that we are not merely facing a "climate crisis" in the traditional sense, but rather a profound and enduring transformation. For the author, "crisis" implies a temporary situation that can be resolved, whereas what we are experiencing is a new structural condition of the planet, which at times obscures the need for a novel approach that recognizes interdependence.

Latour further highlights the need to reconfigure our understanding of politics, economics, society, and climate issues, which are inseparable from cultural and social practices. He proposes that, rather than seeking quick fixes, we must engage in a new type of dialogue and collective action that considers the complexity of ecological and social relations, fostering deeper reflection on how we relate to the world instead of an immediate response to a "state of emergency".

The Sendai Framework for Disaster Risk Reduction (DRR) acknowledges that disasters have exacted a very high cost at all levels. Over the last ten years, this has affected the well-being and safety of people in many countries, particularly those with lower levels of development (United Nation Office for Disaster Risk Reduction [UNDRR], 2015).

In scientific literature, there is a growing consensus that disaster risks are socially produced within a territory (O'Keefe et al., 1976; Wijkman & Timberlake, 1984; Romero & Maskrey, 1993; Wisner et al., 2004; Valencio et al., 2012; Oliver-Smith et al., 2017; Raju et al., 2022). These authors assert that risks and disasters are social constructs combined with extreme natural events.

Vulnerabilities can be understood through the studies proposed by these authors, yet the question remains: how can we reach peripheral communities living in high-risk areas? It is essential to promote the reduction of vulnerabilities in their diverse aspects and to strengthen capacities in the face of impacts caused by extreme events stemming from the new climatic regime. Public management and policies often fail to reach communities forced – due to a lack of alternatives – to occupy areas of high socio-environmental risk, and schools frequently represent the only state presence in these territories.

Disaster Risk Reduction for Education (DRRE) engages people in dialogue regarding causes, effects, and measures for prevention and preparedness for adverse situations. Inspired by the theoretical-methodological principles of Critical Environmental Education that underpin Climate Environmental Education (Climate EE), DRRE contributes to reducing negative impacts arising from extreme climate events through the collective construction of knowledge, particularly in the most vulnerable areas and populations. This approach promotes significant changes in the perception and action of society and various stakeholders, such as managers,

teachers, students, their families, and communities surrounding schools, whether public or private.

To this end, it is fundamental to adopt a transdisciplinary stance to understand the roots of risks and social vulnerability, integrating scientific knowledge with local wisdom (Schenk et al., 2022). Although still under-investigated, the role of religion throughout the disaster cycle has proven relevant – from the interpretation of the event and recovery to prevention strategies.

With the increasing intensity and frequency of extreme climate events, the environmental and climate agenda has gained traction in discussions among diverse social groups, including religious communities. These institutions have expanded initiatives related to this theme, offering the possibility of scaling reflections and practices regarding socio-environmental challenges in territories that the scientific community may not reach. This positive association has constituted a fruitful field for the inclusion and treatment of issues related to climate change, especially in the context of non-formal environmental education.

According to the 2022 Census by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística [IBGE], (2022), Brazil possesses 579,700 religious establishments, including churches, temples, synagogues, and *terreiros* (Afro-Brazilian religious grounds), among others. Their social role has evolved and intensified within various communities, assuming significant potential for articulation and engagement in socio-environmental issues. This is evidenced by initiatives such as the Fraternity Campaign, conducted by the Catholic Church, and by Pope Francis' *Laudato Si'* encyclical (Francisco, 2015). Laudato Si' serves as a framework structuring concepts of Integral Ecology, Social Ecology, Spiritual Ecology, and Deep Ecology in promoting a paradigm shift to "overcome the evils of anthropocentrism and promote a distancing from the 'point of no return' that gravely threatens our ecosystems" (Costa Neto et al., 2025, p. 13).

According to Villela (2024), there is a noticeable growth in actions by religious organizations within communities, fostering dialogue between scientific knowledge and environmental stewardship. With a major impact on social organization, these institutions play a significant role in promoting equity and defending social justice. Religious leaders from diverse traditions – Catholic, Evangelical, Spiritist, Buddhist, Indigenous peoples, and African matrices, among others – promote social actions alongside religious practices that address the varied needs of communities, particularly those in situations of social, economic, physical, educational, and environmental vulnerability.

In this context, one can cite experiences such as the Social Pastorals linked to the Catholic Church, which have expanded their activities by recognizing the climate crisis as an agenda of social justice and the defense

of human rights. The Acácias Project by the Black Evangelical Movement of Brazil promotes the training of Black evangelical leaders to defend the climate and confront environmental racism in their territories. Similarly, interfaith movements and ecotheology networks have been strengthening community practices for climate change adaptation and the promotion of well-being.

Distinct religions evoke a sense of belonging to a community that welcomes, raises awareness, and strengthens individuals, creating social safety nets. It is recognized that religious leaders are key communicators, as they engage daily with people's deepest values. Thus, they promote convergence between religious and environmental ethics, proving to be a pathway for mobilization and action.

In 2022, the National Center for Monitoring and Early Warning of Natural Disasters (CEMADEN) received its first visit from a group of religious leaders selected by the Interfaith Rainforest Initiative in Brazil (IRI-Brazil). This global initiative's mission is to support religious leaders in expanding their contribution to preserving climatic balance, conserving and sustainably using forests, and protecting Indigenous peoples, Quilombolas, and local communities. IRI-Brazil fosters dialogue among religious leaders, the scientific community, and public managers through knowledge regarding the climate emergency and the importance of tropical forests.

The Initiative prompted the CEMADEN and the National Institute for Space Research (*Instituto Nacional de Pesquisas Espaciais*, INPE) to promote 'scientific immersions' featuring lectures by researchers on the climate emergency, disaster risks, and the role of forests. During these immersions, the CEMADEN Education (CEdu) program has the opportunity to work with DRRE Education and Climate Environmental Education through dialogue with religious organizations and leaders in lectures and workshops.

The question posed for these training sessions is: how can education, science, and religion contribute together to confronting socio-environmental disasters and climate change?

The challenge is not merely technical-scientific but also cultural and ethical, such that an integrated approach combining education, science, and religion holds the potential to strengthen the global commitment to planetary preservation. When education, science, and religion work together, they can generate greater impact, as religious leaders can help disseminate scientific and educational knowledge about disaster risks in a global climate change scenario, making the situation more accessible to their religious institutions.

This contact corroborates the potential influence of these leaders within their communities, promoting the dissemination of scientific knowledge by communicating the factors that intensify the climate emergency and disasters, thereby supporting the risk management process. Thus, this article

aims to reflect on educational practices in DRRE and Climate EE aimed at training religious leaders, given their mobilizing role within communities and various social instances.

Furthermore, by respecting and engaging in dialogue with local beliefs and values, educators and scientists can address the root causes of the climate emergency, misinformation, climate denialism, and the lack of political decisions regarding mitigation, adaptation, and resilience.

2. Risk perception and the role of religious leaders in community resilience

Understanding disaster risks is fundamental for formulating efficient and effective prevention and mitigation strategies, increasing risk perception, reducing vulnerability, and promoting the resilience of individuals and populations. Understanding the concepts and potential interactions among the different components influencing disaster risk – including hazard, vulnerability, protection capacity, and public mitigation policies – contributes to developing communities that are more resilient and prepared to face adverse events (Centro Nacional de Monitoramento e Alerta de Desastres Naturais [Cemaden], 2024).

Disaster risk is conceptualized through the interaction between natural and technological hazards, social vulnerabilities, protection capacities, and public risk mitigation policies (Wisner et al., 2012), as demonstrated in Figure 1.

A hazard refers to processes or phenomena that may trigger human,

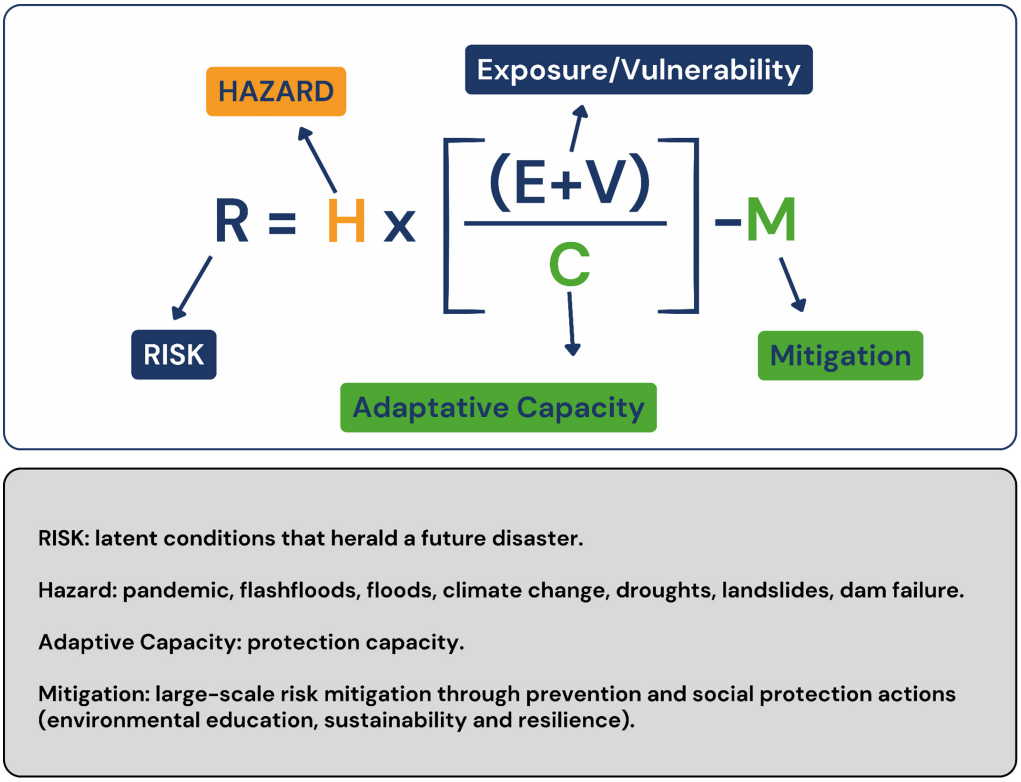


Figure 1

Mnemonic equation expressing the factors involved in increasing and decreasing risks.

SOURCE: Adapted from Wisner et al. (2012).

property, and livelihood losses, as well as cause damage to community health and result in environmental, economic, and social impacts. Examples of hazards include geophysical, meteorological, hydrological, and anthropogenic events, the consequences of which can be widely devastating for society.

Risk exposure is compounded by vulnerability, which, in turn, is characterized by attributes or conditions that increase the susceptibility of people and communities to the adverse effects of a hazard (UNDRR, 2015). These attributes may include socioeconomic factors such as poverty, age group (children and the elderly are more vulnerable), gender (women have higher mortality rates in disasters), persons with disabilities, and lack of access to essential services (education, basic sanitation, health, among others), as well as physical conditions like geographic location and infrastructure quality. Vulnerability analysis is essential for identifying and prioritizing mitigation actions that can reduce the potential impact of disasters.

Protection capacity, meanwhile, is the combination of all strengths, resources, and skills available within a community to manage and reduce disaster risks (UNDRR, 2009). This encompasses both physical and institutional capabilities, including adequate infrastructure, early warning systems, emergency plans, and active community participation in preparedness and response initiatives. Risk mitigation policies are divided into structural – such as structural urban interventions for risk reduction, works for flood reduction, and landslide containment – and non-structural, which include contingency plans, risk mapping, education, and sensitization of local communities (Wisner et al., 2012; Paula et al., 2025).

Communities inhabiting high-risk areas and facing the consequences of extensive and recurrent disasters almost always go unnoticed by public administration, exacerbating the challenge of guaranteeing minimal urban infrastructure and safety in the face of extreme events intensified by climate change (UNDRR, 2009; Carvalho et al., 2013; Marengo et al., 2017).

Disaster risk perception refers to the way people perceive dangers and disaster risks in the environment where they live and how they perceive themselves within these places. It is necessary for assessing the probability of an adverse event producing negative consequences and is triggered by various factors, primarily by DRRE.

Understanding risk perception is crucial for effective disaster prevention and management, as it guides proactive decision-making to mitigate potential impacts. A community with high risk perception may be more willing to adopt preventive measures, such as building disaster-resistant infrastructure and participating in emergency training. Such was the case in Honduras, struck by Hurricane Mitch in 1998. The government built a new bridge over the Choluteca River using Japanese technology. The bridge was one of the few structures that withstood the hurricane's fury. This signifies that Japan's vast experience with disasters made it possible to foresee

risks and mitigate the potential impacts of the gales and hurricanes very common in the region (Pompeu, 2020).

On the one hand, the bridge phenomenon became an example offering several lessons, particularly regarding investments in disaster-resistant infrastructure. On the other hand, post-disaster, it is also important to consider other types of impacts as well as adaptive and recovery capacities.

In this context, a religious leader played an important role in the social recovery of families in two communities in southern Honduras affected by Hurricane Mitch, as analyzed by Barrios (2014). Due to the slow response from authorities in meeting immediate housing needs after the disaster, a group of residents from the municipality of Marcelino, with a history of participation in community organizations, decided to act on their own with the support of a religious leader, initiating an independent search for a place to settle. While the neighboring community, Limón, became more violent due to the presence of transnational gangs, Marcelino displayed stronger social ties among residents and community organizers, with assertive community leadership and limited presence of street gangs (Barrios, 2014).

In Brazil, Law 12.608, Section II, Art. 6, determines that identifying and mapping disaster risk areas is a municipal responsibility (*Lei nº 12.608*, 2012). This mapping must be associated with a reference cadastral base so it can be used for drafting the municipal master plan, macro-zoning, and urban zoning with identification of risk and high-risk areas, and to provide guidelines for DRR (Paula et al., 2025).

In turn, Law No. 14.750 of December 12th, 2023, amended the National Policy on Protection and Civil Defense (Law No. 12.608-2012) to strengthen risk monitoring actions and the production of early warnings. In this sense, the Union's competence includes essential measures to minimize disaster impacts on the population and the environment, advocating active participation in prevention, mitigation, preparedness, response, and recovery actions, while attributing responsibility for these actions to the municipality.

More recently, Law 14.904/2024 defined guidelines for the elaboration of climate change adaptation plans, highlighting, among other measures, in Article 2, item IV:

> The integration between mitigation and adaptation strategies at local, municipal, state, regional, and national levels, in alignment with commitments assumed in the Paris Agreement under the United Nations Framework Convention on Climate Change, through the Nationally Determined Contribution (*Lei nº 14.904*, 2024, p. 8).

Furthermore, item VI of the same article reinforces the need for articulation between adaptation policies and climate risk and disaster management when it provides for:

> Synergy between the National Policy on Protection and Civil Defense (*Política Nacional de Proteção e Defesa Civil*, PNPDEC), established by Law No. 12,608 dated

> April 10th, 2012, the National Protection and Civil Defense Plan, state, district, and municipal protection and civil defense plans, and the National Strategy for Critical Infrastructure Security (*Lei nº 14.904*, 2024, p. 8).

Returning to the relationship between religious leaders and risk perception, prevention, mitigation, and adaptation in communities, Silveira and Bianchezzi (2019) point out that the proliferation of new congregations and leaders in vulnerable territories occurs in a context where "social and community ties with the population are differentiated and constructed in a space without many rules and with low State presence". In this sense, community groups and religious movements can be considered fundamental social organizations for strengthening risk communication originating from their communities, especially in urban peripheries (Fonseca & Garcias, 2021). These actors play a strategic role in promoting community resilience, acting as partners in facing the adversities resulting from disasters.

Disaster risk communication is an important dimension of this action, particularly when considering that it should not be restricted to technical aspects but must dialogue with the social, cultural, and spiritual context of the communities. It is fundamental that they address structural causes of disasters, risk perception, and vulnerability, and promote clear, inclusive, and culturally sensitive communication (Wisner et al., 2025).

Cultural and religious dimensions also influence how risks are perceived, interpreted, and confronted. According to Gaillard and Texier (2010), beliefs can, on one hand, both amplify vulnerabilities and act as potent mechanisms for social cohesion and mobilization. On the other hand, the absence of dialogue between managers and religious leaders can result in communication failures and low adherence to preventive measures. In this regard, Marchezini (2020) proposes valuing the "first mile" – an approach recognizing the leading role of local communities, including religious actors, in communication and participatory, fair risk reduction management.

This relationship between spirituality, social cohesion, and community action contributes directly to building resilience. In some cases, resilience is defined as the qualities or characteristics enabling a community to survive after collective trauma (Sherrieb et al., 2010); in others, it refers to the adaptive capacity of communities to evolve alongside social and environmental changes (Robards & Alessa, 2004). The qualities rendering communities resilient, in turn, are seen as emanating from unique skills, inherent or learned, that a community incorporates before suffering a disaster (Norris et al., 2008).

As Mark Pelling (2011) considers, there are various ways to understand the term resilience when dealing with disaster-related social change. The most common is resilience as a return to stability and, thus, returning to the pre-disaster situation (though if the disaster occurred, that situation

was already unsustainable). Another form is transition, where incremental social changes occur under the exercise of rights and the law. The most complex form of resilience is transformation, grounded in critical consciousness and demanding new rights, changes in the political regime, and the economic system. Education can strengthen communities through transformative resilience, which depends on a critical understanding of social risk factors producing vulnerability to disasters, as well as the pursuit of sustainable livelihoods.

From this perspective, Barrios (2014) argues that definitions of community resilience and disaster mitigation programs must take into account the emergent and relational nature of communities in order to address the root causes and long-term impacts of disasters. The author further comments that current definitions of resilience consider social capital a key element of resilient communities.

The growth of religious diversity, accompanied by the multiplication of temples, groups, and religious movements, demands in-depth analysis, especially when considering traditional practices and religions maintaining a significant connection with nature, such as those of the forest peoples in the Amazon or the Brazilian semi-arid region (Pacheco, 2013; Brandão et al., 2024).

The approach made by IRI-Brazil to the CEMADEN for the scientific immersion was an opportunity to work with participatory methodologies to broaden risk perception and provide religious leaders with a differentiated view on climate science, DRRE, and Climate EE.

3. Methodology

Since 2022, IRI-Brazil has established a partnership with the CEMADEN, conducting technical visits called scientific immersions that include lectures with researchers and workshops from the CEMADEN Education Program. Each visit comprises different leaders from religious groups, and CEdu utilizes its theoretical-practical approaches adapted to construct a reflection on the role of education in disaster risk prevention.

In the theoretical approach, important points regarding disasters were presented, emphasizing they are not 'natural' but socio-environmental, as what is frequently labeled a 'natural disaster' reflects a set of failures in social structures and community prevention capacity. Another point refers to the need to rethink risk management, introducing people-centered systems (Marchezini & Londe, 2018) focused not only on response – the last mile – to disasters, but also on engagement for vulnerability reduction and resilience building in communities.

The methodology applied included educational and participatory activities aimed at promoting experiential and collaborative learning inspired

by the Pedagogical Journeys[1]. The activities encourage the participation of leaders in the universe of climate science to contribute to creating a culture of disaster risk prevention based on the dialogue of knowledge.

The language and methodology of the activities were adapted according to each group's profile so that the experiences resonated with each reality, both in open and dialogical conceptual lectures, by providing speaking spaces for leaders, and in 'hands-on' workshops, where participants were divided into groups.

One of the Pedagogical Journeys applied, 'Oral History: Memory and Perception of Climate Changes,' sought to recall, among religious leaders, lived situations related to the context of disasters. Taking orality as a starting point, narratives were brought forth and subsequently represented visually through different perceptions in drawings.

The 'Pluvipet+App: Participatory Rain Monitoring' Journey was also conducted, seeking to change leaders' perceptions regarding rainfall and the monitoring process, based on the proposal of constructing low-cost rain gauges and creating an observational network in the communities where they operate.

Another methodology applied was the 'Campaign Workshop,' intended to present the #LearnToPrevent[2] (*#AprenderParaPrevenir*) national campaign by CEdu, which motivated participants to think of communication forms to expand the reach of DRR mobilization in their territories. Thus, each group was invited to reflect, elaborate, and collectively develop proposals for disaster risk reduction actions in their localities.

The 'Disasters in Games' workshop was applied with Indigenous leaders as a way to present the theme of socio-environmental disasters and DRR in a more playful format. Free of charge, the CEMADEN provides four serious games[3] co-constructed with researchers in board and card formats for the general community. Serious games are playful activities with educational purposes that go beyond entertainment, seeking to promote learning, reflection, and the adoption of critical and transformative attitudes by participants (Rocha, 2007).

At the end of the workshops, the groups presented their reflections to all participants in the form of posters, PET rain gauges, or wall newspapers, allowing for the sharing of their perceptions regarding the lived experience.

1 Available for free access on the Program's website https://educacao.cemaden.gov.br/jornadas, they offer formative pathways and participatory action research and Citizen Science in Disaster Risk Reduction Education and Climate Environmental Education.

2 #LearnToPrevent (#AprenderParaPrevenir) National Campaign https://educacao.cemaden.gov.br/campanha/a-campanha/

3 'Vale do Risco' (Risk Valley) game https://educacao.cemaden.gov.br/midiateca/jogo-vale-do-risco/
'Minitrunfo' ('Mini-win') game https://educacao.cemaden.gov.br/midiateca/jogo-minitrunfo/
'Na Trilha do Risco' (On the Risk Trail) game https://educacao.cemaden.gov.br/midiateca/jogo-na-trilha-do-risco/
'Quem' (Who) game https://educacao.cemaden.gov.br/midiateca/jogo-quem/

4. Results and discussion

Historically, educational institutions, especially school communities, play an important role as support points and references for families and the surrounding population in composing lifelong education, and can also fulfill a social function in confronting current socio-environmental challenges. For this reason, over the last decade, they have constituted a significant space of action for CEdu, alongside Civil Defense agents, as well as in promoting a culture of disaster risk prevention.

With the approach of the IRI-Brazil initiative, interaction with interfaith leaders showed that these institutions possess equal potential for articulation within communities when compared to schools. It is important to note that many religious institutions act in situations of socio-environmental disasters, especially as shelters in the post-disaster and recovery phases.

We can observe that the participation of religious leaders in meetings organized by the CEMADEN is a significant opportunity to promote critical consciousness regarding the reality of disasters stemming from their religious communities. This indicates an advance in understanding that disasters, provoked by the increased frequency and intensity of extreme weather events, demand practical, collective, and grounded approaches for both their management and prevention, as well as for vulnerability reduction and the strengthening of community resilience.

In total, thirteen religious groups participated in activities offered by CEdu between 2022 and 2024, composed of different traditions from all regions of Brazil, totaling 330 impacted leaders (Table 1). The participating religious groups were: Anglicans, Presbyterians, Lutherans, Assembly of God members, Methodists, emerging Evangelical churches, Spiritists, Indigenous spirituality, Ayahuasca practitioners, Daimists, Catholics, Jewish, African matrix religions, Baptists, and agents of missionary institutions. Some meetings were attended by communication professionals and representatives from state and federal Control and Justice agencies.

The meetings between educators, researchers, and religious leaders allowed for the sharing of personal and collective experiences, valuing knowledge and recognizing the dialogue between religious and scientific cultures. The diversity of voices and plural identities present in the religious field contributed to revealing risk perception and the approach to community-based disaster prevention, mitigation, preparedness, response, and recovery.

Experiences of extreme events, such as the Amazon drought in 2023 and 2024, appeared intensely in the accounts of Indigenous Evangelical leaders during the Oral History Journey workshop. While initially some pastors said there was nothing to be done against God's will, narratives gradually emerged evidencing an unprecedented reality, never experienced by their ancestors. Evangelical Indigenous people also showed their per-

Table 1 Visits by IRI-Brazil to the CEMADEN between 2022 and 2024, with audience types and activities developed.

Date	No. of people	Audience origin	Activity
05/2022	15	Catholic leaders from the Amazon	Lecture
06/2022	14	Evangelical leaders from the Legal Amazon	Lecture
07/2022	17	Influencers and Evangelical leaders from priority regions outside the Amazon	Lecture
08/2022	36	Interfaith leaders	Lecture
05/2023	35	Evangelical leaders from the Amazon	Lecture and Campaign Workshop
09/2023	36	Young Evangelical digital influencers, directors, and editors of Evangelical radios and TVs	Lecture and Campaign Workshop
10/2023	12	Judiciary leaders from the states of Acre, Rondônia, and Amazonas	Lecture
12/2023	13	Religious leaders (board members of the National Conference of Bishops of Brazil – CNBB)	Lecture and Oral History Workshop
04/2024	21	Evangelical leaders	Lecture and Oral History Workshop
04/2024	32	National and international interfaith leaders	Lecture and Artisanal Rain Gauge Workshop
05/2024	17	Indigenous Evangelical leaders from the states of Rondônia, Amazonas, and Maranhão	Lecture and Disasters in Games Workshop
06/2024	40	Interfaith leaders	Lecture and Campaign Workshop
11/2024	42	Evangelical leaders	Lecture

ception that they are not responsible for disasters and climate change, recalling that their ancestral culture has always treated the land differently. Despite this, they are the greatest victims, as they depend on the land and only suffer losses: their food security, mobility during drought periods, as well as social and cultural organization and traditional ways of life. A pastor compared the preserved riverbanks on the Indigenous village side with the opposite bank, where there is a farm that devastated the riparian forest.

Conversations among participants demonstrated the understanding that this is a process marked by different times: in the 'before,' balance, abundance, and the relationship with the cosmological calendar predominated; in the 'now,' drought, monoculture, and impacts on traditional knowledge and ways of life are evident; and in the 'after,' there is a pursuit of harmony, reestablishment of balance, and appropriate use of intercultural knowledge for managing the world (Figure 2, drawing A).

The other drawings, made by other groups, point to the impacts of the socioeconomic system due to disaster situations, becoming a constant part of the routine and life of communities, as well as the fear of a new disaster occurring, as shown in Figure 2 B, C, and D.

Given these scenarios, it is crucial to denaturalize disasters, recognizing their human causes, to promote effective and sustainable responses (Gambardella, 2023), as well as to analyze the triggering factors of disasters in the search for survival strategies, immediate adaptation, and recovery. The concept of resilience (Robards & Alessa, 2004; Sherrieb et al., 2010, Pelling, 2011) highlights the capacity of communities to adapt to adversities,

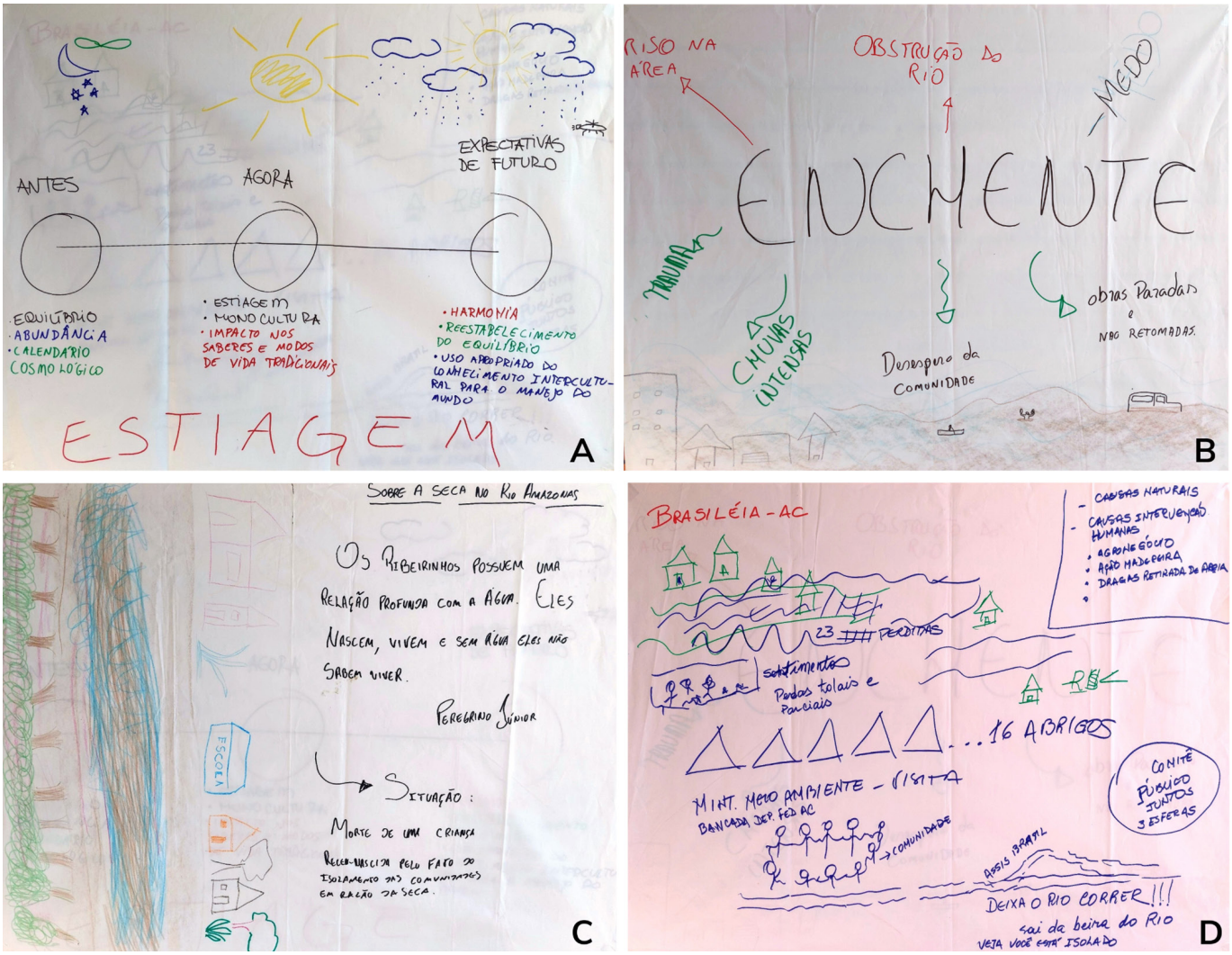


Figure 2

Graphic representations of disasters, presented by groups during the Oral History immersion on April 10th, 2024: (A) on the drought event in the Raposa Serra do Sol Indigenous Territory, Roraima; (B) on the disaster in Recife, Pernambuco; (C) on the drought in Amazonas and Rondônia; (D) on the "flooding" in Brasiléia, Acre.

attempting to reestablish lost balance, but with the possibility of transformation if they are together and connected.

From the discussion on droughts and 'alagações' (floods), a term widely used in Brazil's northern region, leaders expanded their understanding that the recovery of individuals, families, and communities involves not only overcoming physical and emotional traumas but also strengthening through faith, solidarity, traditional knowledge, and increased resilience. These elements are fundamental for reconstruction and collective strengthening. The sensitive listening to these narratives allows for understanding that retrieving individual and collective memories of disasters, though painful, enables a deeper understanding of how leaders perceive risks and react to disasters, in addition to disseminating knowledge in their communities.

The immersion conducted based on the 'Pluvipet+App: Participatory Rain Monitoring' Pedagogical Journey was developed with Brazilian Evangelical leaders composed of pastors, missionaries, theologians, journalists, writers, editors, and digital influencers (Figure 3). With the presence of IRI from the Democratic Republic of the Congo, Indonesia, Colombia, and Peru, and coordination members from the United States, Canada, Norway, and Panama, an engagement strategy was presented that was both concep-

Figure 3
Workshop on making low-cost rain gauges with religious leaders on April 24th, 2024.

tual – citizen science – and practical – rainfall monitoring in each home. The group of 46 participants built artisanal rain gauges with PET bottles for collecting rainfall data, encouraging them to create a community network for systematic precipitation monitoring in their territory.

The group was also able to understand that prevention is not limited to large financial investments in purchasing and installing automatic monitoring equipment in every home, school, or religious institution, or carrying out high-tech construction resistant to extreme events. Based on citizen science, we understand that it is important and more significant to involve people in monitoring processes. In this way, there is collective learning about the risks of each community.

Thus, religious leaders can share within their congregations and institutions knowledge about the risks of excess or scarcity of rainfall, know how to interpret data, share information about potential dangers, understand warnings, and act collectively in building contingency plans.

The activity demonstrated the potential of religious leaders in dissem-

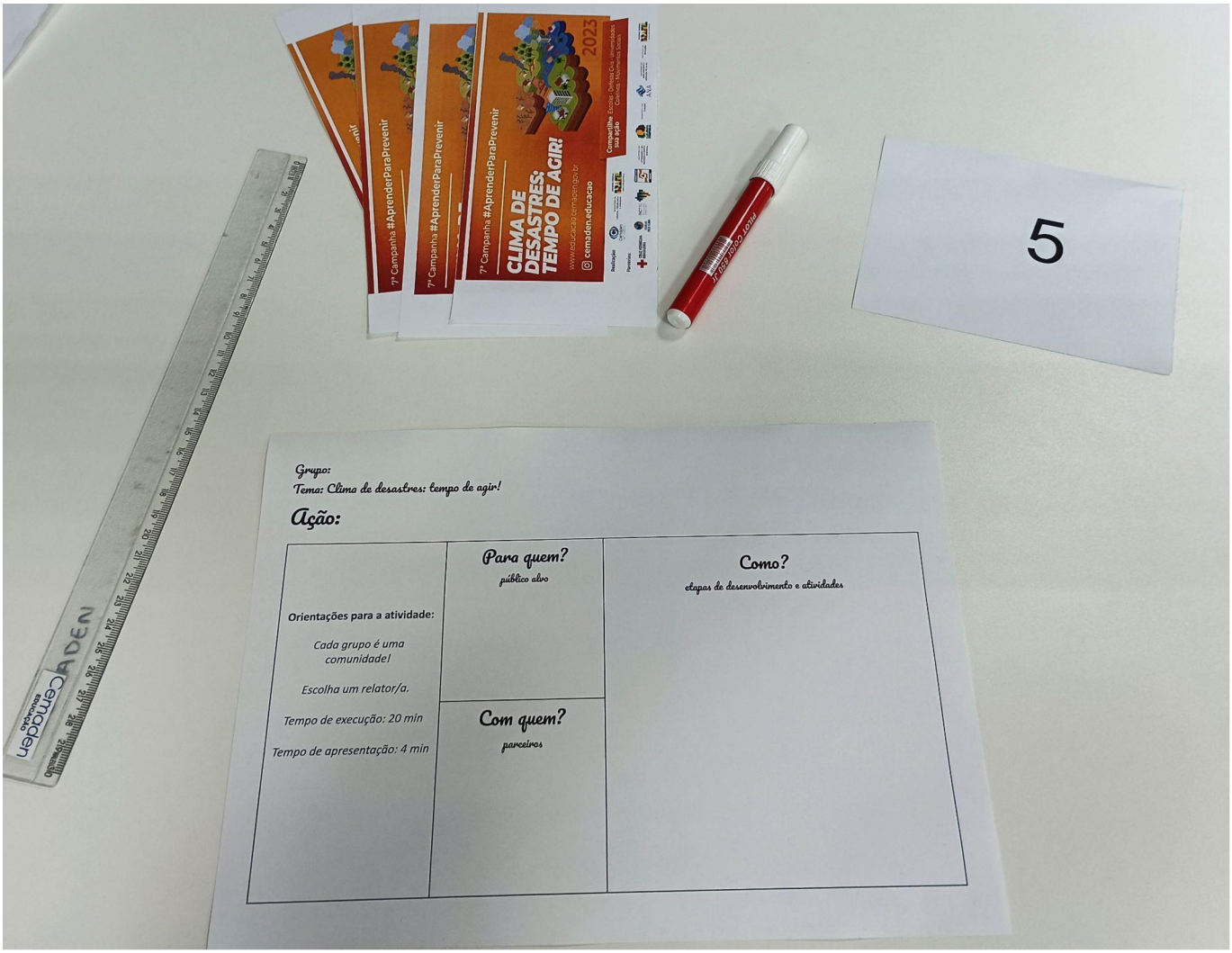
inating knowledge and mobilizing for preventive actions, reinforcing the connection between scientific knowledge and community action.

Promoted annually by CEdu, the #LearnToPrevent Campaign workshop reinforces the fundamental role of campaigns in mobilization and education, being a strategy recommended by the United Nations Office for Disaster Risk Reduction (Matsuo, 2023). Matsuo (2023) further highlights that DRR campaigns are frequently aimed at behavioral change, while the #LearnToPrevent campaign presents the behavioral bias of adopting preventive practices, while simultaneously developing the perception of socio-environmental and climatic disaster risks.

The Campaign Workshop allowed for engaging religious leaders, encouraging them to reflect on how to structure campaigns in their local reality. By learning about already consolidated experiences, such as #LearnToPrevent, leaders could visualize their role as knowledge multipliers in their communities, reflecting on three key questions: "For whom?", "With whom?", and "How?", as can be seen in Figure 4.

In the workshop, different proposals were suggested by the groups; one of them presented their institution as a proponent of actions where young

Figure 4
Campaign Workshop application.



people have sensory experiences with the earth and experience agricultural practices and food preparation, while listening to accounts of the elderly regarding their past experiences (Figure 5A).

The proposal for a campaign with the Quilombola community sought to strengthen the joint action of different social actors, including religious institutions, neighborhood associations, schools, businesses, and public agencies for disaster prevention and response (Figure 5B). The actions for the Campaign are education for transformation initiatives utilizing social media as a tool for communication and community engagement in disaster risk prevention. An innovative idea brought by one of the groups was the creation of a local currency to stimulate economic recovery post-disaster, which could facilitate currency circulation during the community reconstruction phase, within the concept of solidarity economy (Singer, 2002).

Other campaigns focused on sensitizing children, adolescents, and their families regarding waste management and its relationship with DRR. Initiatives included playful activities, such as educational games on waste degradation, and partnerships with recycling cooperatives – often already present in religious institutions – providing a practical experience of cor-

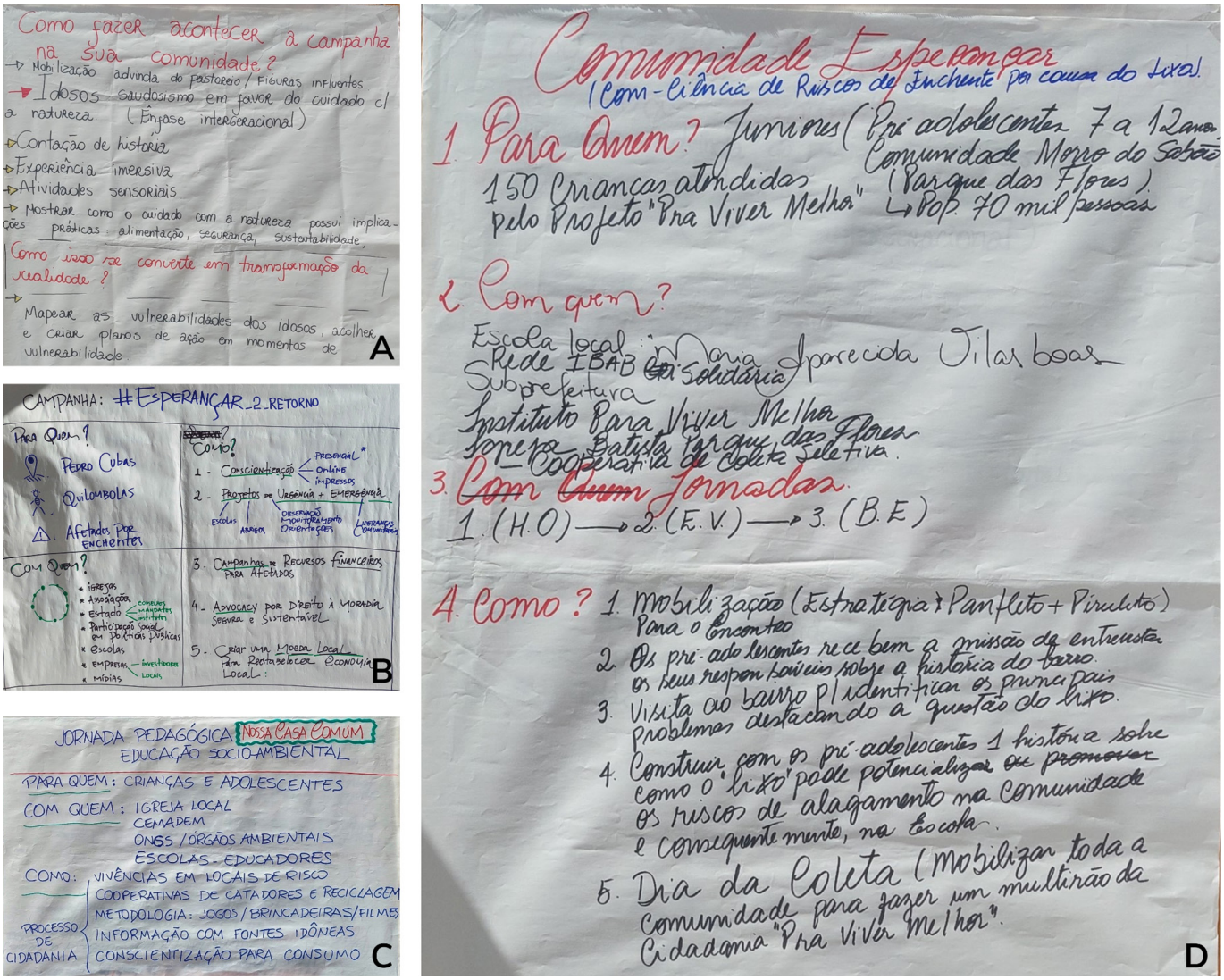


Figure 5

Graphic representations of Campaigns proposed by religious leaders during the scientific immersion on June 12, 2024: (A) on valuing the elderly and intergenerational actions; (B) in the Quilombola community; (C) on the environmental impact of consumption and waste management; (D) on risks associated with waste in the periphery of São Paulo.

rect disposal of discarded materials (Figure 5C-D). In the urban context, inadequate waste disposal can contribute to blocking drainage channels, aggravating the risk of flooding and inundations, thereby increasing socio-environmental vulnerability.

Therefore, the perception of the meetings and more detailed work can provide valuable insights for other studies on how religion, spirituality, and the social organization of these groups, centered around "caring for life" and the "Common Home" (Francisco, 2015; Boff, 2017), become mobilizing forces in facing the challenges of disaster prevention and response.

5. Conclusion

This study reinforces that Disaster Risk Reduction Education and Climate Environmental Education can be expanded when incorporated by religious groups in their territories. These institutions have capillarity and mobilization capacity that allow for delivering information on climate change, risk perception, prevention measures, and a culture of resilience to an audience often unreached by those within research institutes and academia.

Science and religion constitute different forms of knowledge and seek to answer existential questions. While science is founded on observation and seeks explanations that can be tested and validated, religion/spirituality relies on faith and personal experience to provide connection with something often beyond the reach of scientific investigation. In interaction, they can lead to a deeper understanding of the human experience, where science and spirituality coexist and complement each other.

These formative experiences evidence that articulation with different religious leaders can be effective for risk management and communication within the scope of climate sciences due to several factors:

i) The intersection of religion and the environment offers an interdisciplinary perspective, allowing for an understanding of human attitudes and behaviors regarding the environment;

ii) Religious communities frequently play a relevant role in aiding people victimized by climate tragedies and other catastrophes;

iii) Religious communities have extensive experience in social mobilization activities and can be valuable partners in promoting information dissemination, risk communication, local actions, and public advocacy regarding sustainability, adaptation, and socio-environmental resilience;

iv) Human responsibility regarding the careful use of natural resources is a basic precept present in all religious traditions;

v) Religious traditions frequently emphasize ethical and moral values that can be applied to management, environmental education, and DRR; and

vi) Religious leaders and their communities often have significant political influence in the territory where they live and operate, which can be important in monitoring and promoting public policies.

The activities developed in partnership between CEMADEN Education and IRI-Brazil evidenced the possibility of dialogue between religious figures and scientists, creating significant spaces for cooperation, public opinion formation, and social mobilization in the face of the climate emergency, especially in the context of education. This dialogue contributes to overcoming barriers, myths, prejudices, and misinformation by building bridges among those involved, in a dialogical manner, with mutual respect for different cultures and knowledge and without hierarchies.

Interaction with different religious traditions allowed for reflection on the needs for a collective commitment to climate justice, highlighting that confronting socio-environmental crises requires the participation of all sectors of society. The lectures and workshops, many of them intense, profound, and even emotional, demonstrate that open dialogue is essential to create a new reality on Earth, with justice, peace, and fraternity.

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References

Barrios, R. E. (2014). 'Here, I'm not at ease': Anthropological perspectives on community resilience. *Disasters, 3*8(2), 329–350. https://doi.org/10.1111/disa.12044

Boff, L. (2017). *Uma ética da Mãe Terra, nossa Casa Comum*. Instituto Humanitas Unisinos. https://ihu.unisinos.br/?id=565565

Brandão, M. A. V., Santos, C. A. B., & Andrade, W. M. (2024). Impactos das práticas culturais e religiosas sobre a biodiversidade em comunidades tradicionais do Semiárido brasileiro. *Interações, 25*(2), 123–142. https://doi.org/10.20435/inter.v25i2.3889

Carvalho, A. R. D. (2013). Comparação entre os índices de qualidade da água (IQA) dos estuários dos rios Itamambuca e Juqueriquerê. In *Anais do IV Congresso Brasileiro de Gestão Ambiental*. IBEAS. https://www.ibeas.org.br/congresso/Trabalhos2013/VIII-021.pdf

Centro Nacional de Monitoramento e Alerta de Desastres Naturais. (2024). *Educação em clima de riscos de desastres* (Reimpr. rev.). https://educacao.cemaden.gov.br/midiateca/educacao-em-clima-de-riscos-de-desastres-2/

Costa Neto, E. M., Lins, A. C. E., & Machado, L. R. M. (2025). Ecologia integral: Fraternidade como mudança de paradigma. *Revista de Gestão Social e Ambiental, 19*(1), 1–15. https://doi.org/10.24857/rgsa.v19n1-145

Fonseca, M. N. da, & Garcias, M. C. (2021). O papel dos núcleos comunitários de proteção e defesa civil na comunicação de risco de desastre. *Contribuciones a las Ciencias Sociales, 14*(8), 176–188. https://doi.org/10.51896/CCS/AXHI6533

Francisco. (2015). *Laudato Si': Sobre o cuidado da casa comum*. Libreria Editrice Vaticana. https://www.vatican.va/content/francesco/pt/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

Gaillard, J. C., & Texier, P. (2010). Religions, natural hazards, and disasters: An introduction. *Religion, 40*(2), 81–84. https://doi.org/10.1016/j.religion.2009.12.001

Gambardella, D. A. (2023). Questões étnicas, raça e gênero diante das alterações climáticas. *Convergências: Famílias e Políticas Públicas, 3*(3), 16–25. https://doi.org/10.34024/c.2023.3.18712

Instituto Brasileiro de Geografia e Estatística. (2022). *Censo 2022*. https://censo2022.ibge.gov.br/

Latour, B. (2020). *Diante de Gaia: Oito conferências sobre a natureza no Antropoceno*. Ubu Editora; Ateliê de Humanidades Editorial.

Lei nº 12.608, de 10 de abril de 2012. (2012, 10 de abril). Institui a Política Nacional de Proteção e Defesa Civil – PNPDEC; dispõe sobre o Sistema Nacional de Proteção e Defesa Civil – SINPDEC e o Conselho Nacional de Proteção e Defesa Civil – CONPDEC; autoriza a criação de sistema de informações e monitoramento de desastres; altera as Leis nºs 12.340, de 1º de dezembro de 2010, 10.257, de 10 de julho de 2001, 6.766, de 19 de dezembro de 1979, 8.239, de 4 de outubro de 1991, e 9.394, de 20 de dezembro de 1996; e dá outras providências. Presidência da República. https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12608.htm

Lei nº 14.904, de 27 de junho de 2024. (2024, 27 de junho). Estabelece diretrizes para a elaboração de planos de adaptação à mudança do clima; altera a Lei nº 12.114, de 9 de dezembro de 2009; e dá outras providências.https://www.planalto.gov.br/ccivil_03/_Ato2023-2026/2024/Lei/L14904.htm

Marchezini, V. (2020). First mile and last mile: Communication challenges in early warnings for disaster risk reduction. *International Journal of Disaster Risk Reduction, 51*, 101802. https://doi.org/10.1016/j.ijdrr.2020.101802

Marchezini, V., & Londe, L. de R. (2018). Sistemas de alerta centrados nas pessoas. *Revista Gestão & Sustentabilidade Ambiental, 7*, 525–558. https://doi.org/10.19177/rgsa.v7e02018525-558

Marengo, J. A., Nobre, C. A., Szlafsztein, C. F., Valverde, M. C., Souza, C. R. G., Alves, L. M., Kayano, M. T., & Camargo, R. (2017). Vulnerability in Brazilian coastal communities. In V. Marchezini et al. (Orgs.), *Redução da vulnerabilidade a desastres: Do conhecimento à ação* (pp. 397–408). Rima Editora.

Matsuo, P. M. (2023). Muito além da chuva: Práticas educativas na era dos desastres. *RISCOS – Associação Portuguesa de Riscos, Prevenção e Segurança.* https://doi.org/10.34037/978-989-9053-17-5_04

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor. *American Journal of Community Psychology, 41*, 127–150. https://doi.org/10.1007/s10464-007-9156-6

Oliver-Smith, A., Alcántara-Ayala, I., Burton, I., & Lavell, A. (2017). A construção social do risco de desastres. In V. Marchezini et al. (Orgs.), *Redução da vulnerabilidade a desastres* (pp. 97–114). Rima Editora.

O'Keefe, P., Westgate, K., & Wisner, B. (1976). Taking the naturalness out of natural disasters. *Nature, 260*(5552), 566–567. https://doi.org/10.1038/260566a0

Pacheco, A. S. (2013). Religiosidade afroindígena e natureza na Amazônia. *Horizonte, 11*(30), 476–495. https://doi.org/10.5752/P.2175-5841.2013v11n30p476

Paula, A. L. de, Marchezini, V., & Mendes, T. S. G. (2025). Participatory analysis of disaster risk creation. *International Journal of Disaster Resilience in the Built Environment, 16*(3), 378–401. https://doi.org/10.1108/IJDRBE-02-2023-0013

Pelling, M. (2011). *Adaptation to climate change: From resilience to transformation*. Routledge. https://doi.org/10.4324/9780203889046

Pompeu, F. (2020). Adaptabilidade, não se esqueça dessa palavra. *Exame*. https://exame.com/colunistas/frederico-pompeu/adaptabilidade-nao-se-esqueca-dessa-palavra/

Raju, E., Boyd, E., & Otto, F. (2022). Stop blaming the climate for disasters. *Communications Earth & Environment, 3*(1). https://doi.org/10.1038/s43247-021-00332-2

Robards, M., & Alessa, L. (2004). Timescapes of community resilience. *Arctic, 47*(4), 415–427. https://doi.org/10.14430/arctic518

Rocha, P. E. D. (2007). Aplicação do lúdico na educação ambiental. In A. G. Pedrini (Org.), *Metodologias em educação ambiental* (pp. 95–125). Vozes.

Romero, G., & Maskrey, A. (1993). Como entender los desastres naturales. In A. Maskrey (Ed.), *Los desastres no son naturales* (pp. 6–10). Red de Estudios Sociales.

Schenk, E., Albrecht, F., & Löfstedt, R. E. (2022). Culturally sensitive risk communication. *Journal of Risk Research, 25*(8), 1032–1049. https://doi.org/10.1080/13669877.2022.2067472

Sherrieb, K., Norris, F. H., & Galea, S. (2010). Measuring capacities for community resilience. *Social Indicators Research, 99*, 227–247. https://doi.org/10.1007/s11205-010-9576-9

Silveira, D. O., & Bianchezzi, C. (2019). Vozes e identidades plurais. *História Oral, 22*(1), 56–80. https://revista.historiaoral.org.br/index.php/rho/article/view/866

Singer, P. (2002). *Introdução à economia solidária*. Fundação Perseu Abramo.

United Nation Office for Disaster Risk Reduction. (2009). *Terminology on disaster risk reduction*. https://www.undrr.org/terminology

United Nation Office for Disaster Risk Reduction. (2015). *Global assessment of disaster risk reduction 2015*. https://www.undrr.org/publication/global-assessment-report-disaster-risk-reduction-2015

Valencio, N. F. L. da S., Oliveira, R. C., Marchezini, V., & Siena, M. (2012). Desastres e desamparo coletivo. In M. C. O. B. S. Pinto et al. (Orgs.), *Processos de territorialização e identidades sociais* (pp. 123–144). RiMa Editora.

Villela, M. R. (2024). Clima, fé, educação. *Religião & Sociedade, 44*(2). https://doi.org/10.1590/1984-04382024e440206

Wijkman, A., & Timberlake, L. (1984). *Natural disasters: Acts of God or acts of man?* Routledge.

Wisner, B., Alcántara-Ayala, I., Gaillard, J. C., Kelman, I., & Marchezini, V. (2025). *Understanding and addressing disaster risk*. Routledge. https://doi.org/10.4324/9781003292814

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk: Natural hazards, people's vulnerability and disasters* (2nd ed.). Routledge.

Wisner, B., Gaillard, J. C., & Kelman, I. (2012). Framing disaster. In B. Wisner et al. (Orgs.), *The Routledge handbook of hazards and disaster risk reduction* (pp. 18–34). Routledge.