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Introduction: Can the Sendai Framework, the Paris Agreement, and Agenda 2030 Provide a Path Towards Societal Resilience?

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The Problem

The scientific evidence indicates that the Earth's climate is changing, and without taking appropriate and early action, climate change will have severe impacts on our planet and society at large. Under high-end scenarios of climate change, impacts will include: run-away species and habitat loss, including damage to ecosystems and the support services they provide;

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damage to infrastructure, agricultural and trade systems; displacement of human populations, and substantial economic losses (IPCC, 2014, 2019). The 2006 landmark Stern Review emphasises that the benefits of strong early action on climate change outweigh the costs, valuing the cost of inaction at 5% of global GDP each year and for an indefinite period of time (Stern, 2006). The Intergovernmental Panel on Climate Change's (IPCC's) 2019 Special Report on Climate Change and Land states with high confidence that increasing impacts on land, ecosystems and biodiversity are projected under all greenhouse gas emission scenarios with cascading risks occurring across systems and sectors (IPCC, 2019). It also states with high confidence that near-term actions to promote sustainable land management will help reduce land and food-related vulnerabilities. Moreover, sustainable land management practices will provide both short-term positive economic returns and longer-term benefits for climate change adaptation[1] and mitigation,[2] biodiversity and ecosystem functions and services.

Arguably, systemic transformational change is called for to address the impacts of global climate change. The Covid-19 pandemic has generated unprecedented societal and economic challenges, upending conventional practices and behaviours (Singh & Singh, 2020). Due to the large-scale disruptions the pandemic has created, the challenge of 'building forward better' and transitioning to a resilient future is now considered an even greater priority at national, European and global scales (Martin & Mullen, 2021). This moment of societal flux can provide the conditions with which to think outside the status quo and catalyse action to address human activities that are detrimental to our environment, as well as act as a major force in shaping the future of the Earth system as a whole. At this current critical juncture, it is also vital to square up to the real and

[1] Climate change adaptation describes the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects (IPCC, 2014).

[2] Climate change mitigation refers to human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs) (IPCC, 2014).

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present dangers of both climate change impacts and living beyond the capacities of Earth's natural support systems (Folke et al., 2021).

The year 2015 saw the adoption of three interconnected international frameworks: the Sendai Framework for Disaster Risk Reduction 2015–2030, the Paris Agreement under the UN Framework Convention on Climate Change (UNFCCC), and the UN's 2030 Agenda and the Sustainable Development Goals (SDGs). Central to these agreements is the idea of sustainable and equitable economic, social and environmental development (UNCCS, 2017). As highlighted by the international research community (OECD, 2020; Challinor et al., 2018; Dzebo et al., 2017; UNCCS, 2017), these global agreements have created an opportunity to build coherence between interrelated policy agendas that have the potential to identify and reduce systematic risks, promote sustainable development and significantly affect the future of humanity. The theoretical perspectives emerging from empirical evidence of this integration call for greater attention in the international literature. This edited volume aims to address this gap by providing a carefully considered exposition and analysis of the practical basis, as well as limitations, of such an integration project, drawing on examples of both existing and potential integration between these three agendas.

The book includes eleven chapters, beginning with an introduction outlining the key themes, aims and objectives. The following chapters are then divided into three sections. Section I provides an overview of potential best practice approaches to framing and connecting the three agendas. Martin Le Tisser and Hester Whyte (2021) provide international best practice examples that identify how approaches to the Sustainable Development Goals, Disaster Risk Reduction and Management and Climate Change Adaptation are juxtaposed. Their chapter considers opportunities to address global challenges and develop resilience within the context of an integrated whole and as part of a development continuum, instead of as independent and isolated phenomena. It also identifies and characterises opportunities for synergies across the different domains with regards to community and sector vulnerability at local, national and international scales, by emphasising the need for integrated reporting across agreements. Dug Cubie and Tommaso Natoli (2021) focus on the role that international law can play in promoting national, regional and international actions to tackle the impacts on humans of climate change and disasters. They outline the increasing complexity and specialisation of different legal regimes that has

resulted in concerns regarding the confusing fragmentation of international law. The authors propose an 'hourglass' model of the legal relationships between the three different international frameworks based on: systemic coherence at the international level; vertical alignment between the international, regional and national levels and horizontal integration of international norms at the domestic level. Shona Paterson and Kristen Guida (2021) examine risk as a dynamic social construction that is reimagined and reinvented by society over time. Their chapter explores how a greater degree of cohesion between the three aforementioned frameworks might be achieved. The authors discuss how meeting the challenges posed by climate change requires strengthening capacities to respond to both extreme and slow-onset hazards, and continued investment in both adaptation and mitigation efforts. Furthermore, they identify how a concerted effort is required to increase alignment with disaster risk reduction efforts in order to make communities more resilient.

Section II provides case studies from the island of Ireland, the country where this book has been edited. Peter Medway et al. (2021) critically assess the integration of climate change adaptation and disaster risk reduction with a special focus on the Irish policy and governance context. Their chapter first presents a comprehensive overview of the Irish policy environment for these agendas' integration. Alignment with global drivers of integration is then considered, along with the special challenges of subsidiarity, across diverse governance levels and sectors. The chapter employs the SHIELD model, which outlines six pathways to enhance integration across the domains of climate change adaptation and disaster risk reduction. Glen Smith (2021) takes a governance perspective with regards to outlining the criticality of local governance networks engaging with a sustainable pathways approach, thereby encouraging broad input into decision points that support the selection of sustainable future trajectories. These pathways are based on an understanding of risk, vulnerability and opportunity. The coastal town of Youghal provides an Irish case study of a small coastal settlement (population: 9000) in which the value of local governance networks is expounded upon. Similarly, Cathy Burns et al. (2021) explore the potential of local government, in this case in Derry in Northern Ireland, to integrate local authority policy drivers such as disaster risk reduction, emergency planning, risk and assurance, and community resilience. Their chapter outlines the adaptation planning journey

within Derry City and Strabane District Council (DCSDC) in Northern Ireland, reflecting on how the prevailing policy context and level of organisational adaptive capacity can create the conditions for mainstreaming climate adaptation into planning and development.

Section III provides international case studies from South Africa (Sowman & Rebelo, 2021), the Caribbean (Jerez Columbié, 2021), Malaysia (Swee Kiong & Garai Abdullah, 2021), and the interregional (Rogers, 2021). Through the lens of small-scale fisheries (SSFs) in South Africa, Merle Sowman and Xavier Rebelo (2021) explore the vulnerability context of coastal fishing communities, including the various factors that shape their capacity to cope with and adapt in the face of poverty, and the increasing threats associated with climate change and natural and human-induced disasters. The chapter by Yairen Jerez Columbié (2021) focuses on South-South Cooperation between Caribbean SIDS on Climate Change Adaptation and Disaster Risk Management, and triangulation with the European Union and international organisations through the African, Caribbean and Pacific-European Union Natural Disaster Risk Reduction Program (ACP-EU NDRR). It critically analyses collaborations between regional platforms to show evidence of successful transferable adaptation strategies and tools that have emerged from disaster risk management experiences. The chapter by Wong Swee Kiong and Regina Garai Abdullah (2021) highlights the vulnerabilities faced by a resource-deprived riverine community in Borneo, Malaysia. In doing so, the chapter studies how a local community coping with economic and climatic stresses and shocks can increase disaster risk reduction capabilities and adapt to climate change. This research raises the question of how communities that are located in disadvantaged regions can adapt and strive to become more resilient. Finally, Adam Rogers (2021) examines the pivotal role of food in realising the ambitions of the global agendas of Climate Change Adaptation, Disaster Risk Reduction and the SDGs. Rogers advocates for a reduction in (mammal) meat consumption and illustrates the value of reduced meat consumption through the lens of seven of the 17 SDGs: Goal 2) Zero Hunger, Goal 3) Good Health and Wellbeing, Goal 6) Clean Water and Sanitation, Goal 12) Responsible Consumption and Production, Goal 13) Climate Action, Goal 14) Life Below Water, and Goal 15) Life on Land.

Lessons Learned

Overall, the edited volume's framing through resilience, legal and risk-based lenses, and the Irish and international case studies, demonstrates a number of parallel frameworks and approaches that help consider the value of, and ability to increase, resilience to climate change through integrating Disaster Risk Reduction, Sustainable Development Goals and Climate Change Adaptation agendas. When considered collectively, these studies have revealed a number of important key lessons.

Individually, these global agendas address diverse challenges to human security and wellbeing, and collectively can contribute to the creation of a coherent framing for climate resilience, provided they are implemented in support of each other (Kelman, 2017). Each of the agendas recognises resilience as an integral feature of its implementation and success, and resilience provides a means of building linkages and coordination to increase their effectiveness, both individually and collectively (Le Tissier & Whyte, 2021). This recognition is leading to the development of tools – that could use shared targets and indicators across the three agendas. In practice, the use of transferable tools can align policies and management processes, thereby avoiding siloed approaches that have previously characterised the domains of climate change adaptation, disaster risk redcution and the Sustainable Development Goals.

'Just as sand flows from and into either half of an hourglass, the sharing of knowledge and expertise in the fields of climate change adaptation, disaster risk reduction and sustainable development flows from the local, to the national, regional and international, and back again' (Cubie & Natoli, 2021). Cubie and Natoli champion effective vertical alignment to ensure that there is bidirectional exchange of legal principles and operational experience, as well as monitoring of the actions taken at each level. Moreover, it is considered to acknowledge and promote the shared logic and consistencies between the Paris Agreement, Sendai Framework and 2030 Agenda for Sustainable Development, as well as any inconsistencies, to achieve such vertical alignment. Any such alignment will be highly challenging to achieve if there is not a coherent body of norms and practices at the international level. Cubie and Natoli also note the importance of regional organisations in supporting this interactive process of vertical alignment, as evident from the coordinated approach undertaken in the Pacific Region.

There is no one-size-fits-all solution to legal and policy integration at the national level. Full integration via the creation of a unitary governmental department or piece of legislation is not necessarily the best option, with each state needing to review its own domestic structures and context. As a simple visual representation of these processes, the hourglass model aims to promote understanding of the legal relationship between sustainable development, climate change adaptation and disaster risk reduction, and break down the regulatory silos which have hampered effective cross-cutting dialogue and action in the past.

Making decisions on whether risks are acceptable and, if necessary, obtaining reliable information on how these risks can be reduced for human and natural systems is fundamental to all three of the Sustainable Development Goals, Climate Change Adaptation and Distaster Risk Reduction frameworks (Paterson & Guida, 2021). Furthermore, identifying cross-cutting risk framings that can be used both as facilitators and benchmarks in the implementation of these agendas can provide avenues for increased cohesion and connectivity. The regional, national and local case studies discussed in this volume provide empirical evidence of the strategies and specific tools used by practitioners, researchers and governments to face the multifaceted challenges posed to the effective integration of these agendas across diverse territories.

Greenhouse gas emissions in the Republic of Ireland are among the highest in Europe (Burck et al., 2019), and the country's climate policy is often highly politically charged, with significant influence coming from strong, market-based lobbies (Devaney et al., 2020). In this context, the objective to integrate actions for climate change adaptation and disaster risk reduction in the Republic of Ireland is clearly articulated in policy, although the practical arrangements for who, what, when and how have been left open (Medway et al., 2021). Institutions are beginning to work with their peers and collaborators at different levels of government to determine the ways forward, overcome long-established silos and share information more effectively. By increasing the ability of systems to reduce, avoid and transfer new and existing risk, the result should be to reduce the impact of unmitigated residual risk. The Irish Government has set out a clear national governance framework for climate change but has perhaps

overlooked the potential of this local governance architecture (Smith, 2021). This architecture is not an obstacle in implementing change, but a potential asset. It could be mobilised (enticed) to deliver a lot more on climate action. It also shouldn't be assumed that towns and villages govern themselves well. Local projects can be ill-conceived. For example, further research might explore the potential for local focus groups to seek 'sustainable pathways' (IPCC, 2014). The sustainable pathways concept encourages broad input into decision points that support the selection of sustainable future trajectories, based on an understanding of risk, vulnerability and opportunity. The ability to communicate risks and solutions has been the most important tool when undertaking adaptation planning, particularly when discussing the process and securing input or support from colleagues (Burns et al., 2021). Moreover, a significant amount of engagement is required with local government agencies to increase understanding of the relevance of climate change and disaster risk reduction. The study of the Irish context provides insight on how embedding disaster risk reduction and climate change adaptation can enable a greater understanding of specific risks to local governments and act as a catalyst for further action. In the same vein, comparing and contrasting Irish policies with those of other territories has proved useful in identifying global challenges and opportunities for knowledge transfer across continents.

Like the Republic of Ireland, South Africa has an emission-intensive economy. Although facing different challenges, South Africa has developed an important suite of policies, strategies and laws to meet commitments for sustainable development and to address and manage climate change challenges and disaster risks. South Africa's economy has been built on an enduring legacy of colonisation, apartheid and a development model based on mining, agriculture and manufacturing (Chandrashekeran et al., 2017). This socio-historical context has shaped extreme levels of social inequality, which is exemplified by the fact that 8 million people lacked access to electricity in 2014 in a country where 40% of the electricity is consumed by the country's energy-intensive industrial users (IEA, 2016). In 1992, as climate change became part of a global agenda, the South African state began to develop specific administrative and knowledge-generation capabilities to address the challenge. South Africa's national policies, however, are not well aligned or implemented in a

coordinated and integrated manner (Sowman & Rebelo, 2021). Nor are they attuned to the realities facing local communities. Work in coastal communities in South Africa reveals the lack of policy alignment and limited coordination across government departments charged with oversight responsibilities for these endeavours. Incorporating local knowledge into local development and sector plans, as well as into sustainable development and sector-specific policies, strategies and plans at the national level, would enhance understanding of the realities on the ground and lead to harmonious policies, strategies and plans that are more likely to be supported and implemented.

By developing resilience in conditions of extreme geographic and economic vulnerability, SIDS have learned to 'share what works' for climate change adaptation and action. This is achieved through trans-local solidarity and a participatory approach, something which is particularly evident in the evolution of environmental management in the Caribbean (UNDP, 2016). Here, regional platforms are playing a key role in the development of strategies and policies, and in the advancement of knowledge and mutual learning at regional, local and international levels (Jerez Columbié, 2021). Within the context of global inequality, where the communities that were expropriated and enslaved are also the most affected by external debt and the most vulnerable to climate change, acknowledging the historical legacies of imperialism and colonialism is a pre-requisite for saving and improving lives. The forms of solidarity exemplified by Caribbean SIDS can contribute to decolonising the Climate Change Adaptation, Disaster Risk Reduction and Sustainable Development Goals agendas by integrating the knowledge that emerges from vulnerable communities whose survival to processes of colonisation and postcolonial reconstruction is already an example of resilience. A decolonised Global North – one that acknowledges the debt it acquired through slavery, colonialism and imperialism – could play an active role in shaping a new sustainable development model through reparations and climate justice (see Fanon, 2004; Jerez Columbié and Morrissey, 2020; Narayan, 2019).

The case study in Sadong Jaya, Sarawak, Malaysia shows how institutions can play a crucial role in assisting the local community to manage and reduce disaster risk (Swee Kiong & Garai Abdullah, 2021). Their study highlights that access to physical, social, human, natural as well as

financial capitals is crucial for reducing disaster risk among vulnerable riverine and coastal communities. In particular, strong social capital is critical for connecting the community with relevant government agencies and enabling them to access the right information and assistance. Physical transport infrastructure (through building roads) can help to prevent greater loss and damages suffered from the adverse effects of climate change, and also increase the accessibility of labour and produce markets for the local community. In turn, this will enable the local community to improve their resilience and socio-economic wellbeing, especially when they are threatened with depleting natural resources.

Finally, Rogers (2021) plots a path to increased global sustainability, underpinning societal resilience through changes in global food consumption choices. Rogers reports that altering diets to reduce mammal meat consumption is an important tool for countries in achieving the targets of the UN Sustainable Development Goals and the Paris Agreement with regards to climate change. Citing the Lancet Commission, he reports that government policies and subsidies will need to be redirected away from harmful agricultural practices and towards ones that are healthier for our bodies, the environment and the planet.

Challenges and Solutions

The chapters in this edited volume highlight a wide range of challenges to integrating the Climate Change Adaptation, Disaster Risk Reduction and Sustainable Development Goals frameworks/agendas, as well as potential solutions to overcome them.

Challenges

- Each framework (the Paris Agreement, 2030 Agenda for Sustainable Development and the Sendai Framework) has its own institutional arrangement that has established a thematic expertise over time. The challenge is how to balance autonomy with integration so as to lead to greater effectiveness in building resilience across societies (Le Tissier & Whyte, 2021).

- Each framework has built up its own independent knowledge base. An additional challenge is how best to establish data management that allows for interrogation across disciplines and topics, as well as resolution, thus leading to more informed policymaking which can build adaptive capacity and greater resilience in response to climate and disaster risk, and enable sustainable development (Le Tissier & Whyte, 2021).
- Each agenda has progressed along largely siloed lines which makes little sense given the short window of opportunity for tackling the interlinked challenges of climate change, ecosystem degradation, inequality rise and other social, economic and political challenges (Le Tissier & Whyte, 2021; Rogers, 2021).
- There are significant challenges associated with the language and terminology used in the Paris Agreement, Sendai Framework, and the 2030 Agenda (Cubie & Natoli, 2021; Paterson & Guida, 2021). There are references to the need for 'integrated approaches', 'policy coherence', 'policy integration' and 'stronger interlinkages', yet these phrases appear to be used interchangeably and lack proper definition.
- The vulnerability of the peoples from postcolonial territories is exacerbated by the social, political, economic and environmental consequences of a long history of colonisation, enslavement, imperialism and extractivism, which has fuelled industrialisation processes in the Global North and, in consequence, global warming (Jerez Columbié, 2021). Taking a climate justice approach to rightfully frame global warming as an ethical and political issue presents an additional challenge in realising the ambitions of the Climate Change Adaptation, Disaster RiskReduction and Sustainable Development Goals agendas.
- The challenge of so-called 'soft law' – a broad range of authoritative but non-binding sources (at both the domestic and international levels) – is clear in the implementation of the three global agendas (Cubie & Natoli, 2021).
- Policies and plans for the three agendas are often developed in an iterative but narrowly focused way, dealing with one issue at a time rather than attempting a holistic and integrated approach (Medway et al., 2021; Sowman & Rebelo, 2021). The result is a series of policies, plans and initiatives that, while individually reasonable, appropriate and

often benchmarked against international good practices, can be siloed and may miss opportunities for integration during implementation.
- There are also challenges in reconciling the differing definitions of criticality across different sectors and systems (Medway et al., 2021). This is the case with mapping the cascade of risks that cross the intersection of different critical infrastructure systems one example being the flood risk that threatens the critical access road for the electricity sub-station, hospital or fibre-optic cable.
- At a local government level, challenges can arise in maintaining support for planning for the three agendas with concerns around responsibilities and buy-in (Burns et al., 2021). The push-back is often associated with limited human and financial resources.

Potential Solutions

- A coherence of approach is needed in order to place the assessment of climate change and disaster risk reduction within a wider context of outcomes for sustainable development, framed by the goals and targets set out by the Sustainable Development Goals. This context recognises that Climate Change Adaptation, Disaster Risk Reduction and the Sustainable Development Goals, as drivers of change, represent a set of aspirational human rights around what constitutes future sustainability (Le Tissier & Whyte, 2021).
- It needs to be recognised that risks increasingly have interdependencies and cascading effects within and across multiple sectors that cannot be addressed through any one of the agreements (Le Tissier & Whyte, 2021; Paterson & Guida, 2021).
- While there is no one-size-fits-all solution to legal and policy integration at the national level, full integration via the creation of a unitary governmental department or piece of legislation is not necessarily the best option, and each state will need to review their own domestic structures and context (Cubie & Natoli, 2021). However, emerging practice is based on the expectation that enhancing integration at the domestic level can reduce duplication and optimise the use of limited resources and the sharing of technical expertise, as well as reflecting and supporting coherence at the international level.

- Meeting the challenges posed by climate change requires not only strengthening capacities to respond to both extreme and slow-onset hazards as and when they occur, and continued investment in both adaptation and mitigation efforts, but also a concerted effort to increase alignment with disaster risk refuction efforts in order to make communities more resilient (Paterson & Guida, 2021; Swee Kiong & Garai Abdullah, 2021). This reality increases the urgency to (i) understand the nature and variability of current and emerging risks, and (ii) increase the capability of assessing climate risks and resiliency opportunities as they evolve.
- Another potential avenue for connectivity includes increased understanding of the root causes of disasters, and how this practice can be reframed by the no-natural disasters movement (Gould et al., 2016; Kelman, 2020; Oliver-Smith, 2002; Paterson & Guida, 2021). Defining a disaster as a social construction that 'does not happen unless people and cities are vulnerable due to marginalisation, discrimination and inequitable access to resources, knowledge and support' (Chmutina et al., 2017) centres both climate change adaptation and disaster risk reduction on matters of equity and social justice as well as long-term time frames with a collective outcome. This frame also recognises that the most effective way of addressing the risks posed by climate change, hazards and disasters is to lessen the underlying factors causing vulnerability (Schipper & Pelling, 2006).
- Regular renewal of the political consensus on the need for long-term investment in the three agendas is needed (Medway et al., 2021). This helps to sustain the commitment to long-term change beyond the typically short-term planning horizons of any government and gives confidence to planners, implementers, the public and other critical stakeholders in transitioning to a low-carbon and highly adapted economy. The consensus should set out the reciprocal responsibilities of the state and its citizens, detailing when, how and where the state will step in to deal with the consequences of climate change, and when individuals and communities must take responsibility. Long-term financing solutions can then be developed based upon the agreed responsibilities.

- The 'sustainable pathways' concept encourages broad input into decision points that support the selection of sustainable future trajectories, based on an understanding of risk, vulnerability and opportunity (Smith, 2021). The process could be overseen by local 'climate action officers' who would be employed to work full time on mitigation and adaptation solutions.
- Under the banner of 'increasing resilience' there is potential to embed the three agendas across local government functions (Burns et al., 2021). For example, in the Northern Irish case study, the district council has committed to embedding climate adaptation within the heritage and culture functions of the organisation, by identifying and addressing the impacts, risks and opportunities of climate change for local heritage assets, collections, cultural programmes, festivals and events.
- Local communities working in partnership with NGOs and other social partners can contribute considerable knowledge and experience, as they are experiencing the effects of climate change and disasters first-hand, and have practical proposals for dealing with and adapting to climate change and promoting sustainable livelihoods (Smith, 2021; Sowman & Rebelo, 2021). Although their experience and knowledge are based on their local environmental context, the ideas generated at this level are likely to produce proposals for local socio-economic development, climate adaptation and disaster risk reduction that are locally appropriate and supported. Incorporating this local knowledge into local development and sector plans, as well as sustainable development and sector-specific policies, strategies and plans at the national level, has the potential to enhance understanding of the realities on the ground and lead to policies, strategies and plans that are more harmonious and therefore likely to be supported and implemented.
- Transdisciplinary and decolonising approaches to the three agendas offer opportunities for addressing climate justice challenges through the integration of the knowledge of early adaptors in the Global South. This will result in research and action for more coherent, inclusive and effective theory, policy and praxis responses to environmental challenges (Jerez Columbié, 2021).

- Social capital can play an important role in increasing community resilience (Swee Kiong & Garai Abdullah, 2021; Rogers, 2021). Supportive human and physical infrastructure can increase educational and employment opportunities as well as access to markets, and facilitate coordination and communication with government agencies.

This edited volume presents a rich array of practical lessons and frameworks for engaged research that consider the integration of the agendas of Climate Change Adaptation, Disaster Risk Reduction and the Sustainable Development Goals. What is striking in all the chapters is the complexity of how to take meaningful action to address what are truly global challenges (with cascading transboundary impacts), largely experienced at a national to local level. However, the findings also indicate the significant potential of integration as a means of breaking out of disciplinary silos, sharing and expanding on existing synergies between agendas, and moving towards more holistic approaches of recognising and addressing the complexities of socio-ecological systems. In doing so, vulnerabilities can be reduced and resilience enhanced. As highlighted by most chapter authors, subsidiarity and community participation efforts should be considered key factors in striving towards increased resilience. Moreover, the pivotal role of values, ethics and climate justice in creating a vision of societal resilience is also evident.

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