LITERATURE REVIEW ON ALIGNING CLIMATE CHANGE ADAPTATION (CCA) AND DISASTER RISK REDUCTION (DRR)

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Cover photo: The headman of a coastal informal settlement in Lautoka (Nadi, Fiji) showing the level reached by water on his house entrance in recent cases of floods.

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Literature review on aligning climate change adaptation (CCA) and disaster risk reduction (DRR)

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CONTENTS

ACRONYMS AND ABBREVIATIONS

AR	Assessment Report (IPCC)
BAP	Bali Action Plan
CAF	Cancún Adaptation Framework
CCA	Climate change adaptation
CoP	Conference of Parties
DM	Disaster management
DRM	Disaster risk management
DRR	Disaster risk reduction
EWS	Early warning system
GCA	Global Commission on Adaptation
GHG	Greenhouse gases
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel for Climate Change
IRC	Irish Research Council
LDC	Least developed country
MSCA	Marie Skłodowska-Curie Action
NAP	National adaptation plan
NAPA	National adaptation programmes of action
NDC	Nationally determined contribution
NGO	Non-governmental organisation
REAP	Risk-Informed Early Action Partnership
RCRC	Red Cross Red Crescent
SDGs	Sustainable Development Goals
UN	United Nations
UNDP	United Nations Development Programme
UNDRR (UNISDR)	UN Office for Disaster Risk Reduction
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly

INTRODUCTION

Context

Resolutions and reports adopted at the international level in the last few years provide that a more consistent and sustainable alignment between climate change adaptation (CCA) and disaster risk reduction (DRR) is today considered a global priority.[1] The present review offers a comprehensive and up-to-date overview of existing knowledge on the topic and looks into an array of potential avenues for solutions from the literature that could be relevant for law and policy at the national and sub-national level, as reported in the literature.

As commonly stated in the literature, the basic connection between CCA and DRR lies in the overarching goals of both sectors, namely reduction of losses due to climate-related hazards (including both slow-onset and extreme events)[2] and the improvement of communities' resilience (i.e. their capacity to regain equilibrium after critical system disruptions)[3]. In that perspective, several implementing actions could indistinguishably relate to DRR and CCA and can, therefore, be mutually beneficial.[4]

Furthermore, both sectors can have direct and intertwined implications in the adoption of sustainable development measures,[5] as well as in other fields of action (e.g. food security; reduction of social inequalities; protection of vulnerable groups; and safety of ecosystems).[6] The two sectors also recognize that the impact of hydrometeorological and climate-related hazards is felt most intensely by the poorest and more marginalised sectors of populations.[7] Further, the humanitarian "cost" of the lack of integrated and effective strategies to prevent climate-related disasters could almost double by 2050.[8]

For all these reasons, the literature widely acknowledges that a comprehensive understanding of the two sectors within national and sub-national institutions, normative frameworks and implementation mechanisms would allow for: greater impact by law and policies; more efficient use of available resources (both human and material); and more effective action in reducing vulnerabilities.[9] This appears as pivotal for the improvement of governmental and societal responses against climate risks that threaten human beings and ecosystems all around the globe.

However, while the conceptual boundaries in normative development, policymaking and programming have progressively lessened in the past few years, a sustainable and practical approach to integrating CCA and DRR appears to still be "in its infancy".[10] The most emblematic evidence of the persistence of these gaps at the national level is the lack of a clear understanding of how existing climate risks relate to the sector of disaster risk management (DRM),[11] and how DRR norms, policies and actions systematically considers future climate change patterns. Indeed, the literature suggests the way in which the different disaster management phases (preparation, response, recovery and mitigation) are designed, incorporate new or predicted impacts and accommodate changes in the frequency and magnitude of climate-related events over time, indicates how (and if) CCA-DRR combination is taking place.

Methodology and structure

Aimed primarily at a policy audience and mainly focusing on national and sub-national scales, the present study is part of the preparatory analysis and research undertaken by the International Federation of Red Cross and Red Crescent Societies (IFRC) and the School of Law of the University College Cork of Ireland. It is aimed at filling the gaps and update existing knowledge, recommendations and advocacy tools on law and DRR.[12] The request for a better understanding of the proper meaning of "CCA-DRR coherence",[13] and on how law and policies could promote it, has been expressed by governmental representatives and National Red Cross Red Crescent Societies in the course of a series of thematic workshops organised by the IFRC.[14]

This review will provide the baseline for further in-country research aimed at assessing and evaluating the processes that led to the adoption, or hindered, particularly innovative national and sub-national legislation and policies favouring CCA-DRR coherence. This advanced research will be conducted through qualitative methodologies techniques, mainly consisting of semi-structured interviews with "key-informants" (i.e. public officials, parliamentarians, Red Cross Red Crescent staff, lawyers, technical experts, scholars, representatives of local association and NGOs).

This study has been realised through a desk-based collection of technical-scientific analysis; policy documents; institutional reports; and research studies and at all levels. The selection and comparative assessment of these documents have been instrumental to the work of synthesis and systematic consolidation of their content. However, such an effort did not necessarily ponder the objective basis and factual elements on which those findings have been provided.

As for its structure, the first section of the document will retrace the current understanding of the main concepts in both disciplines and the role of the key bodies respectively involved. The following section outlines the historical basis for the juxtaposition of CCA and DRR, focussing on the main points of contact, synergies and overlaps. Next, the main gaps, limitations and obstacles that still hinder a practical combination of adaptive and risk-reduction measures are explored. The final section consolidates a series of recurring recommendations and suggested measures to be considered by stakeholders aiming at scale up their "climate-smart disaster risk management" approach.[15]

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"No one organisation, network or government can end the climate crisis overnight, but we can act together to stop a climate catastrophe from engulfing hundreds of millions of lives in disaster after disaster."

Francesco Rocca

President of the International Federation of Red Cross and Red Crescent Societies

IFRC, The Cost of Doing Nothing (2019)

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CCA AND DRR
UP-TO-DATE SUMMARY OF BASIC TERMS AND CONCEPTS

1.1 CLIMATE CHANGE ADAPTATION (CCA)

Any process that causes adjustments to a climate system—from a volcanic eruption to a cyclical change in solar activity—could be described as creating "climate change".[16] However, the phrase is most often used today as shorthand for anthropogenic climate change—in other words, climate change caused by humans.

The principal way in which humans are understood to be affecting the climate is through the release of heat-trapping greenhouse gases (GHG) into the air.[17] Therefore, climate change is often used interchangeably with "global warming", thus reflecting the strong warming trend that scientists have observed over the past century or so. Strictly speaking, however, climate change is a more accurate phrase than global warming, as rising temperatures can cause a host of other climatic impacts, such as changes in rainfall patterns. Plus, climate change can also cause irregular decreases in temperatures at the local level.

Very generally speaking, there are two main potential responses to climate change: mitigation and adaptation. While the first addresses the root causes, by reducing greenhouse gas emissions, adaptation seeks to lower the risks posed by the consequences of climatic changes.[18] Both approaches are today considered by the international community as

necessary and complementary strategies: even in the case of a substantial reduction in GHG emissions in the coming years, adaptation will still be necessary to deal with the negative effects that have already been set in motion.[19]

Adaptive practices to climatic conditions have commonly been adopted by humans in different cultural and geographical contexts throughout history. Nevertheless, contemporary trends in climate change patterns affecting the frequency, variability and magnitude of meteorological hazards raise the need to scale-up a wide range of preventive and preparatory measures. The key objective of climate change adaptation (CCA) is, therefore, to reduce human vulnerability to events provoked by climate change.

"Vulnerability" can be considered as determined by three factors: exposure to hazards (such as reduced rainfall), sensitivity to those hazards (such as an economy dominated by rain-fed agriculture), and the capacity to adapt to those hazards (for example, whether farmers have the money, access or skills to grow more drought-resistant crops).[20] Adaptation measures, both spontaneous or pre-planned, aim at influencing these three factors to build adaptive capacities (i.e. through infrastructural improvements or prompting changes in the population habits).

In 2015, through the adoption of the Paris Agreement on Climate Change of the United Nations Framework Convention on Climate Change (UNFCCC), the international community hoped to strengthen the ability of countries to deal with the impacts of climate change, with a strong focus on climate change mitigation. In addition, however, the Paris Agreement acknowledged adaptation as "a global challenge faced by all with local, subnational, national, regional and international dimensions" and took into account "the urgent and immediate needs of those developing country Parties that are particularly vulnerable to the adverse effects of climate change".[21] From a legal point of view, all Parties accepted to engage in adaptation planning as well as to submit and periodically update an adaptation communication on their priorities, implementation and support needs, plans and actions.[22]

On the implementation side at country level, national adaptation plans (NAPs) are today key in identifying sectors for strengthening resilience and the UN has called on governments to mainstream them with national strategies on development and risk.[23] Building on the previous national adaptation programmes of action (NAPAs), more focused on projects and only considering least developed countries (LDCs), NAPs can be established by all States as a means for identifying respective medium- and long-term adaptation needs and developing and implementing strategies and programmes to address them. In addition, nationally determined contributions (NDCs), key documents for the achievement of Paris Agreement long-term goals, embody efforts by each country not only to reduce national emissions but also to adapt to the impacts of climate change.[24]

1.2 DISASTER RISK REDUCTION (DRR)

Starting from the position that there is no such thing as a 'natural' disaster, but only natural and technological hazards that can impact on society and the environment at different scales,[25] disaster risk reduction (DRR) is today defined as:

> *"[t]he concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events".*[26]

In a nutshell, DRR primarily aims to reduce the damage caused by "small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risks"[27]—"through an ethic of prevention".[28]

According to the definition above, it must be considered that preventive concepts and practice are equally applicable to different sectors of society including (among others) land management, food production, building codes, funding systems, and education. The choices made by governments in

these sectors affect vulnerability and resilience levels of people and property against the occurrence of a wide variety of hazards.

DRR policies and strategies are, therefore, connected with the more practical concept of disaster risk management (DRM) jointly with preparedness and risk assessment measures, e.g. early warning systems (EWS),[29] but is also linked to the concept of sustainability, since "in order for development activities to be sustainable they must also reduce disaster risk".[30] Thus, DRR implies cross-sectoral action involving both the public and private sector, which interacts with major global dynamics such as demographic trends, migration flows, economic development, and climate change.[31]

The identification of DRR as a distinct sector dates back to the last decade of the 20th Century when the UN General Assembly (UNGA) decided to designate the 1990s as an "awareness-raising" decade in which the international community paid special attention to the promotion of international co-operation in this field.[32] The first World Conference on Natural Disasters held in Yokohama, Japan in 1994,[33] together with the International Strategy for Disaster Reduction established by the end of the decade,[34] represent the two foundational milestones of this period. The second World Conference on Disaster Reduction, held in Kobe, Japan in 2005, led to the adoption of the Hyogo Framework for Action 2005–2015, aimed at "building the resilience of Nations and communities to disasters".[35]

Currently, the main DRR policy framework at the global level is the Sendai Framework for Disaster Risk Reduction 2015–2030, adopted at the Third UN World Conference in Sendai (Japan) in 2015.[36] Its main goal is to "prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience".[37] As stated in its global Target E, the international community committed to "Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020".[38] The innovative adoption of benchmark indicators and evaluation mechanisms, endorsed by the UNGA in 2016, were deemed necessary for the monitoring and assessment of State progress.[39]

"The international community committed to substantially increase the number of countries with national and local disaster risk reduction strategies by 2020."

The format and content of national and local DRR strategies may vary, and they can be framed in one single comprehensive document or in a system of tools across sectors and stakeholders "with one overarching document linking them".[40] However, some fundamental elements are required for an effective and successful DRR strategy, such as the need to promote policy coherence, the existence of a legislative framework for its enforcement, a clear definition of public and private responsibilities, clear timeframes and stable financial support.[41]

While national DRR strategies fall under the direct responsibility of national and/or subnational authorities, governments can also benefit from the existence of supranational regional platforms.[42] In fact, these regional bodies act as multi-stakeholder forums for intergovernmental collaboration and exchange, where governmental representatives commit to improving coordination and implementation of disaster risk reduction activities, thus linking global and regional policies to national and local DRR legislation, strategies or plans. The increasing focus on promoting the role of local actors requires a linkage between global, regional and national strategies and plans to support concrete action at the community level.

The UN Office for Disaster Risk Reduction (UNDRR)—formerly known as UNISDR—is the focal point of the United Nations system for disaster risk reduction and the custodian of the Sendai Framework. It provides a vehicle for cooperation among governments, organisations and civil society actors in the implementation of the Framework, supports countries and societies in its implementation, monitoring and review of progress.

ENDNOTES

1 See IFRC, *The Cost of doing nothing. The humanitarian price of climate change and how can be avoided* (2019a) 21; ECOSOC Resolution E/2019/L.18, 20 June 2019 §23–26; IFRC Strategy 2030: A platform for change (2019) 5–6; Global Commission on Adaptation, *Adapt Now: A Global Call For Leadership On Climate Resilience* (2019) 7; IFRC World Disaster Report (2018) 220; UNGA Res. 70/1, Transforming our world: the 2030 Agenda for Sustainable Development (2015) Goals 1.5 and 13.1; Sendai Framework for Disaster Risk Reduction 2015–2030 (2015) 11, 13, 19 (h), 33 (a), 47 (d); International Conference of the Red Cross and Red Crescent 2015, Resolution n. 6.; IFRC, *A guide to mainstreaming guiding principles disaster risk reduction and climate change adaptation* (2013a) 3–6; IPCC, *Managing the risks of extreme events and disasters to advance climate change adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change* (2012) 582.

2 Beyond the capacity to influence not only the intensity, but also the frequency, duration and magnitude of sudden events (e.g. storms, floods, landslides and avalanches) climate patterns are also considered as having causal links with slow-onset events as temperature extremes, drought, desertification, sea-level rise, epidemic disease.

3 On the prolific use of the term 'resilience', including its shifting conceptions from 'bounce back' to 'bounce forward' see Siders A., *Resilient Incoherence—Seeking Common Language for Climate Change Adaptation, Disaster Risk Reduction, and Sustainable Development*, in Peel J. and Fisher D. (eds.) The Role of International Environmental Law in Disaster Risk Reduction (2016) 114 - 120.

4 IFRC and UNDP, *The Handbook on Law and Disaster Risk Reduction* (2015) 49; Tearfund, Linking climate change adaptation and disaster risk reduction (2008) 5; RCRC *Climate Guide* (2007) 25.

5 Siders A. (2016) 101; Schipper L. and Pelling M., *Disaster risk, climate change and international development: Scope for, and challenges to, integration, in 30 Disasters* (2006) 15.

6 European Environment Agency (EEA), *Climate change adaptation and disaster risk reduction in Europe. Enhancing coherence of the knowledge base, policies and practices*, EEA Report No 15/2017 (2017) 12;

7 IFRC (2019a) 21–23; Hallegatte et. al, *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*. Climate Change and Development Series, World Bank (2017) 25–56; IFRC (2013a) 19–20.

8 IFRC (2019a) 3; on the multi-faceted humanitarian impact of climate change see also Norwegian Red Cross, *Overlapping vulnerabilities: the impacts of climate change on humanitarian needs* (2019).

9 Pearn G., *Guidance Note: Coherence Concepts and Practices – Global Initiative Disaster Risk Management* - GIDRM | GIZ (2019) 10.

10 UN FCCC/TP/2017/3, *Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015–2030* Technical paper by the secretariat (2017) 46.

11 Defined as "the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses", see UNGA, Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction A/71/644 (2016) 15. On the concept of (and strategies for) "understanding disaster risk" see Sendai Framework for Disaster Risk Reduction 2015–2030 (2015) paras. 14, 23–25.

12 See IFRC and UNDP, *Effective Law and Regulation for Disaster Risk Reduction: A Multi-Country Report* (2014).

13 See the working definition of "coherence" proposed by Pearn G. (2019) 7, "the approach and deliberate processes and actions within a country to integrate – as appropriate – the implementation of the Sustainable Development Agenda, Sendai Framework for Disaster Risk Reduction, and Paris Agreement; in order to increase efficiency, effectiveness, and the achievement of both common (e.g. resilience) and respective goals". See also Siders A. (2017) 110.

14 These calls were voiced in two regional conferences held on the theme 'Legislating for Climate Smart Disaster Risk Management' which took place in 2018 in the Pacific and in Latin America respectively. The events brought together RCRC National Societies, as well as government representatives from national disaster management agencies and regional inter-governmental organizations.

15 See 'Joint Communiqué from Stockholm Policy Forum on Climate Smart Disaster Risk Reduction' (October 2009). The Forum was co-organised by the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR), the Swedish International Development Cooperation Agency (SIDA), and the UN International Strategy for Disaster Reduction (UNISDR); see also Mitchell T. et al., *Climate Smart Disaster Risk Management, Strengthening Climate Resilience* – IDS (2010) 9–11.

16 The Inter-governmental Panel on Climate Change (IPCC) defines climate change as: "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Available at: https://www.ipcc.ch/sr15/chapter/glossary/.

17 According to the IPCC, Greenhouse Gases (GHG) are "gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds". Available at https://www.ipcc-data.org/guidelines/pages/glossary/glossary_fg.html.

18 According to the IPCC WGII definition, CCA is "[t]he 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". See IPCC, 5th Assessment Report – AR5 (2014) 1758. See also Schmidt-Thomé P., *Climate Change Adaptation*, Oxford Research Encyclopedia of Climate Science (2017).

19 IFRC (2019a) 4; Global Commission on Adaptation (2019) 10; IPCC, *AR5 Synthesis Report: Climate Change* (2014) 76; Fisher S., *What is climate change adaptation?* (The Guardian), available at www.theguardian.com/environment/2012/feb/27/climate-change-adaptation (27 February 2012); RCRC Climate Guide (2007) 15.

20 Fisher S. (2012).

21 The Paris Agreement (2015) art. 7 (2).

22 With the Katowice climate package at CoP24 (2018), states agreed on further operational guidance on how to communicate information on adaptation, see https://unfccc.int/process-and-meetings/the-paris-agreement/katowice-climate-package#eq-2.

23 IFRC, *How to engage with National Adaptation Plans* (2013b) 15. The United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (CoP) established the National Adaptation Plan (NAP) process in 2010 Under the Cancún Adaptation Framework (CAF). For further insights on legal forms and contents of these documents see Abeysinghe A., Dambacher B. M. and Byrnes R., *National adaptation plans: understanding mandates and sharing experiences* - IIED (2017) 8–12.

24 Art. 4.2 of the Paris Agreement requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

25 A hazard is defined as "A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation", UNGA, Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction A/71/644 (1 December 2016) 41.

26 *Ibid*, 10–11. This definition has also been adapted for the use of the IFRC in "Measures aimed at preventing new and reducing existing disaster risk", see IFRC, *Disaster Risk Management Policy - from prevention to response and recovery* (2019) on file with the author.

27 Sendai Framework for Disaster Risk Reduction 2015–2030 (2015), para. 15.

28 See https://www.unisdr.org/who-we-are/what-is-drr.

29 Early warning systems are defined as "An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.", Report of the open-ended intergovernmental expert working group (2016) 17.

30 Available at https://www.unisdr.org/who-we-are/what-is-drr.

31 Wahlstrom M., *Strengthening the Coherence Between DRR, Climate Change, and Sustainable Development*, Key Note Address at the High Level Development Dialogue, 11 May 2015, Ulan Bator, Mongolia, 2015

32 UNGA Res 44/236 (1989). See Bartolini G. and Natoli T., *Disaster risk reduction: An International Law perspective*, in 48 Questions of International Law (2018) 3–4.

33 UNGA Res. 49/22 A (1994).

34 UNGA Res. 54/219 (2000).

35 UNGA Res. 60/195 (2005).

36 UNGA Res 69/283 (2015).

37 Sendai Framework for Disaster Risk Reduction 2015–2030, para. 17. See also para. 25.b, which states that "To promote the conduct of comprehensive surveys on multi-hazard disaster risks and the development of regional disaster risk assessments and maps, including climate change scenarios" should be considered among other priorities for action.

38 *Ibid.*, para. 18.

39 See UNGA Res (2016) UN Doc A/71/644 and UNGA Res 71/276 (2017). Updates data are available at https://sendaimonitor.unisdr.org/.

40 UNISDR Plenary session 1: national and local disaster risk reduction strategies paving the way for action by all. Issue brief – final draft. (2017) 4.

41 UNISDR, *Think piece on national disaster risk reduction strategy requirements* (2017) 5–6.

42 See https://www.unisdr.org/we/coordinate/regional-platforms.

2

LINKING CCA AND DRR
TWO SECTORS WITH CONVERGING AIMS

2.1 HISTORICAL ALIGNMENT

In light of the definitions provided above, it is evident that the two sectors are closely and substantially interrelated through their conceptual understanding, main purposes, professional expertise and practice.[1] Nevertheless, at the international level, the cognizance of these overlaps is relatively recent. The origin of the CCA-DRR convergence process can be traced back through the work of the Intergovernmental Panel for Climate Change (IPCC).[2]

Before the 2000s, climate change was mainly considered as an environmental problem and the response emphasised the reduction of greenhouse gases. In this phase, the discussion on climate change adaptation in the IPCC was seen, to a certain extent, as a "distraction" from more rigorous climate change mitigation goals.[3] The period between the 2000s and 2012 was then defined by the growing recognition that the effects of climate change were unavoidable and as such required humanity to adapt in the near term.[4] In particular, the third assessment report of the IPCC (AR3, 2001) drew the world's attention to the unavoidable impacts of human-induced climate change, so the need for adaptation moved onto the international agenda.

In this phase, the first mechanisms envisaged under the UNFCCC were NAPAs which aimed to enhance the understanding of adaptation for developing countries and enable concrete measures to be taken.

While the Hyogo Framework for Action 2005–2015 promoted the integration of CCA and DRR strategies and called for a clear identification of climate-related disaster risks,[5] the Bali Action Plan (BAP) agreed by the XIII Conference of the Parties (CoP) in 2007, placed adaptation on an equal footing with mitigation and highlighted DRR as a critical tool for CCA.[6] In 2010 (UNFCCC CoP 16) States agreed on the Cancún Adaptation Framework, which included setting up an Adaptation Committee to promote the implementation of stronger, cohesive action on adaptation.[7]

With the development and publication of the IPCC Special Report on Managing the Risk of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX Report, 2012), as well as with the activation of the special programme of the United Nations Framework for the Convention on Climate Change on Loss and Damage (UNFCCC, 2012) and the Warsaw International Mechanism the following year,[8] greater emphasis was put on actual cooperation and synergies between DRR and CCA in international negotiations, national programmes and local activities. The same approach has been expressly recognised by the international community in the outcome document of the United Nations Conference on Sustainable Development (Rio +20).[9]

Nowadays, thanks to these paradigm-setting developments, the international community widely recognises the need to discuss the development of common CCA-DRR strategies in a more coherent manner.[10] As mentioned in the introduction, non-linear change in hazard intensity and frequency is widely acknowledged, as climate change is affecting the intensive and extensive nature of risk (e.g. generating more powerful storms, aggravating coastal flooding, bringing higher temperatures and longer droughts), leading to calls to proclaim the existence of a "climate emergency".[11]

The idea that climate-related hazards are often influenced or even caused by human interventions, as in the case of climate change, is commonly considered by the scientific community as a major driver and amplifier of disaster losses and failed development.[12] Moreover, higher risks could also derive from indirect effects such as declines in water quality and food security,[13] threats to human health,[14] and changes in disease vectors such as malaria and cholera.[15]

This highlights the systemic interactions between natural and non-natural risks, which often require complex and uncertain assessment and evaluation approaches.[16] Against the recognition that the management of risk is directly affected by climate change, the overall picture on how to envision major coherence between DRR and adaptation to climate change remains relatively opaque, with direct consequences for practical cooperation on the ground. Additionally, the protection of the most vulnerable against climate-related hazards is often multifaceted and context-dependent, as it also addresses the fulfilment of basic rights, needs, and livelihoods and is thus linked by some authors to the broader concept of "human security".[17]

2.2 SIMILARITIES, INTERCONNECTIONS AND COMMON CONCERNS

The core elements for assessing the DRR-CCA relationship have been identified by the IPCC SREX Report (2012) in the so-called 'determinants of risk'. The Report differentiates three key factors tied to disaster risk in a specific context: physical events (hazards), exposure and vulnerability.[18] It emphasises that changes in the physical climate system due to natural variability and anthropogenic climate change need to be considered separately from vulnerability and exposure of individuals and communities. These two variables are in turn considered as "dynamic, varying across temporal and spatial scales, and depend on economic, social, geographic, demographic, cultural, institutional, governance, and environmental factors influenced by development processes".[19]

The evolving discourse around the concept of vulnerability undertaken since 2000 by CCA and DRR experts and practitioners, has become a fundamental point of contact and source of integration over the years.[20] In this regard, the SREX Report strengthens the understanding of the social construction of risk through the lens of vulnerability, not simply considering the latter as a characteristic of physical phenomena but rather as shaped by human and societal processes and patterns. Hence, DRR and CCA are embedded and closely linked to

sustainable development processes. Also, from the medium-long term perspective, CCA and DRR are directly influenced by other trends (e.g. migration flows and demographic changes) which act as a key factor in determining the evolution of vulnerability and exposure patterns.

"[B]uild the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other [...] environmental shocks and disasters" (SDG 1.5)

At present, these links are clearly identified throughout the UN Agenda 2030 and by its centrepiece, the Sustainable Development Goals (SDGs). In fact, among the numerous references to climate-related disasters contained therein, SDG 1.5 stresses the need to "build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other [...] environmental shocks and disasters". Moreover, SDG 13.1 urges States to "Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries". Any measure that is aimed at combining CCA and DRR—in regional, national, or local plans—can potentially be "mainstreamed into risk-informed socioeconomic development planning".[21] Reflecting the need for policy coherence, the parallel commitments set out in Target E of the Sendai Framework and in States' NAPs under the UNFCCC are expected to contribute towards the accomplishment of the SDGs.

Among the most relevant initiatives recently launched at the global level, the Global Commission on Adaptation (GCA) was launched on 16th October 2018 by former UN Secretary General Ban Ki-moon to inspire policies and action among decision-makers, including heads of state and government officials, mayors, business executives, investors, and community leaders.[22] Building on one of the key action-tracks established by the GCA to prevent disasters, the Risk-Informed Early Action Partnership (REAP) was presented at the UN Climate Action Summit in September 2019. The main focus of the REAP is to scale-up investment in people-centred early warning systems, expand forecast-based financing and action in the humanitarian sector, and to strengthen national social protection systems and the coherence of disaster management and adaptation policies.[23]

Beyond references to how the issue is framed at the international level and in global strategies, the CCA-DRR nexus concretely takes shape in national laws and policies. For example, the abovementioned NAPAs provide a process for LDCs to identify specific areas of urgency and have access to targeted project funding.[24] The 51 NAPAs submitted so far to the UNFCCC by LDCs highlights in some cases the importance of DRR, as for instance in stabilising the availability of water during dry seasons or managing increased malaria risk.[25] The most recently presented NAPA, submitted by South Sudan in 2017, clearly identifies DRR as a priority thematic area and highlights a key adaptation project currently being undertaken to establish improved drought and flood EWSs through an improved hydrometeorological monitoring network as a means of reducing the impact of those events on rural communities.[26]

The parallel NAP process started in Durban in 2011 and open to all developing countries (not just to LDCs as in case of NAPAs), is aimed at a more holistic and flexible approach towards a comprehensive medium- and long-term climate adaptation planning. Among the 13 NAPs submitted to the UNFCCC Secretariat as of November 2019, only 3 (Brazil, Colombia, Fiji) clearly refer to the Sendai Framework; while only the one presented by the Republic of Fiji addresses the topic of "Policy Alignment to International Processes" in a dedicated section.[27] Moreover, some general references to DRR and/or DRM have been made in more than 50 Nationally Determined Contributions (NDCs)[28] reports submitted by State parties as required by the Paris Agreement, although only in two cases (Colombia and India) is the Sendai Framework explicitly mentioned.[29]

In the past decade, some virtuous (but isolated) practice of integration of CCA and DRR in legal and policy

frameworks have been identified at the national level,[30] and convergence examples have been observed within some European countries, thus providing examples of subnational implementation.[31] The specific forms of shared approaches for reducing and managing disaster risk in a changing climate are likely to vary and can be supported by reform and policies that national and local authorities embark on in several fields of activities. For instance, the adoption of "adaptive" social protection tools (e.g. weather-based crop insurance or off-farm employment guarantee schemes in rural areas) has been identified as a potential improvement for strengthening local resilience and reinforcing people's coping capacities.[32] The mobilisation of resources by public and/or private stakeholders (e.g. risk financing plans and insurance schemes considering longer-term prevention) is also considered as a suitable solution in both sectors.[33]


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Appropriate dissemination of information regarding current and expected climate risks has been recorded as an example of integrated adaptation and risk management practice and some improvements have been highlighted at the national level regarding the way in which the management of climate risks has been communicated to the general public.[34] In some specific cases, an amelioration of data sourcing and modelling capacity on climatic extremes by both government meteorological/hydrological agencies and university departments have been recorded and identified as an important element for the adoption of practical measures, in particular, to improve communication to end-users.[35]

Despite the handful of examples provided above, and assuming the potential benefits deriving from greater CCA-DRR alignment as a means of tackling different phases of the same 'risk continuum', previous literature on the topic has highlighted an overall lack of models and widespread national practice of such alignment, especially from a normative perspective.[36] It has been recognised that States' disaster management laws and policies (as well as other relevant sectoral laws) still need to better integrate risk governance, climate change adaptation efforts and development planning.[37] As will be outlined in the following paragraph, the accomplishment of this goal is still hindered by several factors.

2.3 MAJOR CHALLENGES AND GAPS IN LINKING DRR AND CCA

Beyond the alignment of aims and areas of intervention, the fact that the two sectors have partially diverging backgrounds, methodologies and scopes of action has also been considered by relevant literature. A commonly referred aspect is the types of hazards respectively addressed: the scope of action by DRR practitioners is wider than CCA, as the former also considers geophysical (e.g. earthquakes, tsunamis, volcanic eruptions and landslides) and technological (e.g. nuclear radiation, toxic wastes, dam failures) hazards.[38] Moreover, despite gradual incorporation of scientific advances, members of the DRR community mainly stem from the humanitarian sector and practitioners may be, therefore, more focused on learning from past experiences and undertaking risk assessments as a benchmarking exercise, thus putting more emphasis on local communities and localised needs.[39]

Conversely, climate adaptation experts ostensibly tend to consider long-term projections and predicted effects, including changes in ecosystems and loss of biodiversity, and therefore their scientific perspectives are more future-oriented. Their action mainly follows more traditional intergovernmental dynamics, springing from a relatively recent policy agenda, with article 7 of the Paris Agreement (2015) currently being the normative point of reference

at the international level. Rather than focusing on the more immediate impacts of disasters, climate change adaptation activities often have broader political-social-economic-environmental implications across a wide range of sectors.

The acknowledgement of these differing perspectives should not be overestimated or considered as an insuperable obstacle toward a more holistic approach between the two sectors. On the contrary, it should help in identifying how and where synergies start and stop, and mutual benefits can be achieved.[40] A full understanding of the specific shortcomings and differences between DRR and CCA identified so far, can help to explain why integrated "climate-smart disaster risk management" remains underdeveloped.

According to the findings provided by the extensive literature on the topic, these can be grouped in three categories: a) physical and temporal gaps (i.e. different spatial and temporal scales); b) cultural gaps (i.e. differences in the management of knowledge, communication and information); and c) institutional gaps (i.e. different sources of authority or norm systems).

A Physical and temporal gaps

While DRR is commonly framed in a local dimension, being based on how a disaster is expected to affect a specific human community, climate change is a challenge that has historically been addressed at the global scale.[41] Despite the localised effects of climate change having been increasingly considered,[42] the way in which hazard patterns, vulnerabilities and risks are addressed and expected to evolve, is still often geographically unaligned between the global and the local.

This could result in a scarcity of climate models downscaled to the regional and local dimensions.[43] One of the main barriers to downscaling is the need to consider the multitude of risk variabilities within any single country or locality (e.g. vulnerability conditions as well as socio-economic dynamics). In fact, the implementation of CCA and DRR frameworks is necessarily country- and context-specific, and one-size-fits-all models for coherence could, therefore, be unsuitable.[44]

The different timescales for resource provision and programme implementation constitute an additional point of friction between CCA and DRR. While CCA is more inclined to longer-term perspectives and planning, it has often been the case that political attention and resources for disaster risk reduction activities are more pronounced in the aftermath of disasters and therefore are generally based on more event-related perceptions.[45] Despite the developments acknowledged in 2015 by the Sendai Framework, thanks to which DRR "now officially focuses on disaster risk management with a short, mid and long-term view,[46] these temporal discrepancies can still hinder procedural and operational integration of respective projects and interventions put in place by policymakers and practitioners.

B Cultural gaps

A wide range of stakeholders (including scientists, NGOs, policy-makers, the private sector, and educators) is potentially involved in any attempt to align CCA-DRR perspectives. Despite growing links between such professional disciplines, unharmonised expertise and different ways in which scientific knowledge, statistical data, traditional and local-indigenous knowledge and technical information are collected, processed and communicated have been detected as a barrier.[47]

In this sense, different emphasis on relevant concepts, and the adoption and use of different registers (i.e. terminologies and definitions) permeate the two "cultures", the members of which often struggle in finding a common language and debating about the same spectrum of knowledge.[48] Such weak reciprocal understandings could make the identification and implementation of common strategies more difficult. At the same time, some literature recorded difficulties in the effective translation of research and academic research outputs into practice (i.e. tools and techniques) as a hindrance for joint innovation.[49]

The collection and access to a reliable and comprehensive dataset on past and future events and trends by climate and disaster risk professionals can be hindered by different modelling capacities and quality. According to some literature, discontinuous and low-resolution information about the localised impacts of climate change has raised the level of uncertainty associated with climate projections at the local level. This has generated bottlenecks in the elaboration of cross-cutting analysis and subsequent decision-making, with particular regard to developing countries.[50] Growing uncertainty also results from the difficulties in modelling the complexity of systemic risks, i.e. the impact of extreme events which depends on the interaction of multiple different factors.[51]

Beyond differences in methodologies for generation and understanding of data, the way in which technical information influences decision-making processes is also relevant. In a "vertical" sense, the lack of communication and transparency between researchers, decision-makers and beneficiaries could hamper the implementation of combined CCA-DRR activities.[52] In both sectors, technical information can be hard to access and understand, especially for local decision-makers, civil society actors and the general public, for a variety of reasons (such as lack of scientific knowledge, heuristic techniques based on practice, or cultural biases among others). As a result, local communities may lack the capacity to interpret the relevant data, thus hindering a complete awareness and understanding of expected climate-related risks.[53]

C Institutional gaps

Divergences also relate to the way in which CCA and DRR activities are respectively framed by relevant bodies, both at the national and international level. In terms of global governance, the lack of systematic and long-term strategic planning for the integration of CCA and DRR knowledge and actions has been reported as an issue,[54] and the two sectors are still coordinated and considered by different intergovernmental fora and institutions. Consequently, different external financing systems for domestic action could also represent an element of fragmentation.

This pattern is generally reproduced at the country level, where respective activities are often embedded in different administrative entities and are therefore linked to diverse normative frameworks and funding lines.[55] For instance, environmental ministries and meteorological services are more commonly responsible for climate change issues, while the management of disasters and related risk is more often put under the responsibilities of civil defence/protection agencies, ministry of defence/army, ministry of interior or infrastructure development. A clearer allocation of roles and

responsibilities between stakeholders, especially at different institutional levels, has been identified in the literature as a driver for improvement.[56]

A third potential stream of political authority, normative source and implementing activities are those dealing with development programmes and agencies, normally more related to economic institutions. In these contexts, adaptation and risk reduction should also be considered in order to avoid trade-offs or even conflicting outcomes.[57] This could lead to a more complex and distributed system of roles and responsibilities, further weakening horizontal coordination.[58]

Vertical setbacks are also possible, i.e. when sectoral responsibilities are shared by national, regional and local administrations. This fragmentation, together with limited funding directly aimed at supporting CCA-DRR integration, often results from a lack of political commitment and motivation; especially at the higher levels of authority, where both the attention on economic growth and on immediate humanitarian aid, can prevail and affect the way in which relevant norms and policies are designed, political objectives are framed and implementing programmes are financed.[59]

The potential involvement of external donor-driven projects is not often suitably linked with national policies and development plans, and this could result in unsustainable and dispersed initiatives.[60] A discouraging element in this sense arises from the difficulties in demonstrating to donors the concrete and short-term results of mainstreaming CCA and DRR actions. In fact, donors tend to focus on short-term "tangible" outcomes, while the outcomes of CCA-DRR integration are mostly visible over longer periods.[61]


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ENDNOTES

1 IFRC (2013) 5;

2 The IPCC is a UN body founded in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). It evaluates climate change science and provide policymakers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options.

3 Schmidt-Thomé (2017) 4.

4 Birkmann J. and Pardoe J., *Climate Change Adaptation and Disaster Risk Reduction: Fundamentals, Synergies and Mismatches*, in Glavovic B. C., Smith G. P. (eds.) Adapting to Climate Change, Environmental Hazards (2014) 50.

5 Hyogo Framework for Action 2005 – 2015 (2005) 19 (c), 30 (g).

6 Mitchell T., van Aalst M. and Villanueva P. S., *Assessing Progress on Integrating Disaster Risk Reduction and Climate Change Adaptation in Development Processes*, Strengthening Climate Resilience Discussion Paper 2 (2010) 10.

7 More information available at https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean#eq-3.

8 At CoP19 (November 2013) in Warsaw, Poland, states established the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts ('Loss and Damage Mechanism'), to address loss and damage associated with impacts of climate change, including extreme events and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change.

9 UN, 'The Future We Want. Outcome document of the United Nations Conference on Sustainable Development Rio de Janeiro', Brazil, 20–22 June 2012, para. 188.

10 See references in footnote n. 1. See also IFRC, *Framework for Climate Action Towards 2020* (2017) 27; *UNISDR Strategic Framework* 2016–2021 (2017) 6–7.

11 UNDRR, *Global Assessment Report on Disaster Risk Reduction* (2019) x; National Academies of Sciences, Engineering, and Medicine, *Attribution of Extreme Weather Events in the Context of Climate Change* (2016) 1–4; Herring S. C. et al., *Explaining Extreme Events of 2017 from a Climate Perspective*, in Bulletin of the American Meteorological Society 100/1 (2019); IFRC (2013a) 3–4.

12 IPCC, SREX Report (2012) 16.

13 Warner K. et al., *Where the rain falls: climate change, food and livelihood security, and migration*, CARE, UNU-EHS Institute for Environment and Human Security (2012) 14.

14 See Watts N. et al., *The Lancet Countdown on health and climate change* (2019) 1–2; EEA (2017) 12;

15 O'Brien et al., *Disaster Risk Reduction, Climate Change Adaptation and Human Security. A Commissioned Report for the Norwegian Ministry of Foreign Affairs* (2008) 10–11.

16 Schweizer P., Governance of systemic risks for disaster prevention and mitigation. Contributing Paper to GAR 2019, 10–11.

17 Adger, W. N. et al., *Human Security*, in C. B. Field et al. (eds.) 'Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change' (2014); O'Brien et al. (2008) 26–27, considering "human security" as "closely linked to the development of human capabilities in the face of change and uncertainty".

18 IPCC, SREX (2012) 4.

19 *Ibid*., 7.

20 Giupponi C. and Biscaro C., *Vulnerabilities—bibliometric analysis and literature review of evolving concepts*, Environmental Research Letter 10 (2015) 2.

21 UNDRR (2019) x; See also World Bank, *Building Resilience, Integrating Climate and Disaster Risk into Development. The World Bank Group Experience* (2013) 13–16.

22 The Commission is led by Ban Ki-moon, Bill Gates and Kristalina Georgieva. It is guided by 34 Commissioners, consisting of leaders from political, business, multilateral, and scientific worlds; and is convened by 20 countries. A global network of research partners and advisors support the Commission. The Commission is co-managed by the World Resources Institute and the Global Center on Adaptation. See: https://gca.org/global-commission-on-adaptation/home

23 Global Commission on Adaptation Report (2019) 63. See also http://www.globalresiliencepartnership.org/wp-content/uploads/2019/09/REAP-two-pager-230819.pdf

24 The process of the development of NAPAs was initiated during the UNFCCC CoP 7 conference in Marrakesh in 2001 and is funded by the Least Developed Countries Fund (LDCF), which is based on voluntary contributions from developed countries and managed through the Global Environmental Facility.

25 See https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/napas-received; McDonald J. and Telesetsky A., *Disaster by Degrees: the Implications of the IPCC 1.5° C Report for Disaster Law*, in 1 Yearbook of International Disaster Law (2019) 77; Commission on Climate Change and Development, *Closing the Gaps: Disaster risk reduction and adaptation to climate change in developing countries* (2009) 77.

26 Republic of South Sudan, *National Adaptation Programmes of Action (NAPA) to Climate Change* (2016) 40.

27 Republic of Fiji, *National Adaptation Plan. A pathway towards climate resilience* (2018) 8–17.

28 The Paris Agreement requests each country to outline and communicate their post-2020 climate actions, known as their NDCs. Each climate plan reflects the country's ambition for reducing emissions, taking into account its domestic circumstances and capabilities. See https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs.

29 UNFCCC (2017) 13.

30 Pearn G. (2019) 18–21; Abeysinghe et al (2017) 10, mentioning the Vietnamese Law on Natural Disaster Prevention and Control of 2013 in which natural disaster prevention and control activities include adapting to climate change (the Law "provides for a new National Strategy on Natural Disaster Prevention and Control, with a 20-year vision, to be created every ten years and adjusted every five. Natural disaster prevention and control plans are to be developed every five years and adjusted annually"); UNESCAP, *Disaster risk reduction and resilience-building: Ensuring coherence across the global development agendas* - Summary Report (2017) 5, mentioning the cases of Philippines, Fiji and Nepal; IFRC and UNDP (2015) 34, citing the Philippines' Disaster Risk Reduction and Management Act of 2010; IFRC and UNDP (2014) 65–66, mentioning Algeria, the Dominican Republic, Mexico and Uruguay as countries that developed laws that coherently integrate DRR, CCA and development planning; Nachmany M. et al., *The GLOBE Climate Legislation Study: A Review of Climate Change Legislation in 66 Countries*, GLOBE International and the Grantham Research Institute LSE (2014) 4 and 7, referring (among others) to the 'Nationwide Integrated Disaster Risk Management and Climate Change Policy' adopted by the Federated States of Micronesia in and the '2013–2025 National Strategy for Climate Change' adopted by Mozambique in 2012; UNISDR Briefing Note 02, *Adaptation to Climate Change by Reducing Disaster Risks: Country Practices and Lessons* (2009) 3–9, reporting cases from Maldives, Peru, Philippines, Samoa, South Africa, United Kingdom and Vietnam.

31 EEA (2017) 11; Examples include the German Adaptation Strategy (DAS) to Climate Change (2008), considering both the impact of gradual climate changes and the consequences of the expected more frequent and stronger extreme events, and the pioneering United Kingdom Climate Impacts Programme (UK-CIP) which was established in 1997 and aims at improving the exchange of knowledge between climate change adaptation and the related agendas of mitigation, DRR and sustainable development.

32 Global Commission on Adaptation (2019) 63; Davies M. et al., *Climate Change Adaptation, Disaster Risk Reduction and Social Protection*, Institute of Development Studies (2008) 7–11.

33 EEA (2017) 121–123, mentioning the 'Extraordinary Risks Insurance Scheme' in Spain, where common ground between CCA and DRR is found in sharing models and disaster data, and in discerning trends; Waltraud E. et al, *Implementing adaptation under the Paris Agreement: how can comprehensive climate risk management (CRM) support National Adaptation Planning (NAP) processes and NDC implementation*, GIZ (2017) 5, mentioning the African Risk Capacity (ARC) is one of the regional climate insurance facilities under the international Climate Risk Insurance Initiative 'InsuResilience'.

34 See ESPREssO Project, *Synthesis report of existing legal, policy and science approaches in relation to DRR and CCA* (2017) 54, mentioning the case of the Environment Agency in the UK disseminating findings on climate-related risk to the public through specific programmes and workshops.

35 Few et al., *Linking Climate Change Adaptation and Disaster Risk Management for Sustainable Poverty Reduction*. Synthesis Report (2006) 6.

36 IFRC and UNDP (2015) 49; IFRC and UNDP (2014) 19.

37 World Bank, *The World Bank Group Action Plan on Climate Change Adaptation and Resilience* (2019) 13.

38 UNDRR (2019) 316; IFRC (2013a) 4; Tearfund (2008) 7–9.

39 EEA (2017) 17; Tearfund (2008) 10–12; Sperling F. and Szekely F., *Disaster Risk Management in a Changing Climate* (2005) 13.

40 Tearfund (2008) 12.

41 Schipper L. and Pelling M. (2006) 33

42 See for instance RCRC, *Heatwave guide for cities* (2019).

43 Doswald N., Estrella M., *Promoting ecosystems for disaster risk reduction and climate change adaptation: Opportunities for Integration* – UNEP (2015) 7

44 Pearn G. (2019) 7.

45 Birkmann J. et al., *Addressing the Challenge: Recommendations and Quality Criteria for Linking Disaster Risk Reduction and Adaptation to Climate Change* - DKKV Publication Series 38 (2009) 30.

46 UNDRR, DRR4NAPs: *Promoting synergy and coherence between climate change adaptation and disaster risk reduction through National Adaptation Plans* (version for comments 23 February 2019) 12, on file with the author.

47 Leitner M. et al., *Draft guidelines to strengthen CCA and DRR institutional coordination and capacities* - PLACARD project (2018) 10–11, noting that, despite "[a]bout 60% of the terms currently used in the CCA and DRR communities overlap", their meaning can be quite different, resulting in numerous misunderstandings."

48 Siders A. (2017) 116; Giupponi C. and Biscaro C. (2015) 10.

49 ESPREssO Project (2017) 52.

50 UNFCCC (2017) 22–23; Few et al. (2006) 5–6.

51 UNDRR (2019) 47; IFRC (2017) 10.

52 UNISDR, EUR-OPA, Council of Europe, *Climate Change Adaptation and Disaster Risk Reduction in Europe. A Review of Risk Governance*; ESPREssO Project (2017) 52.

53 Few et al. (2006) 7.

54 Kelman I., *Climate Change and the Sendai Framework for Disaster Risk Reduction*, in 6 International Journal of Disaster Risk Science (2015) 125, according to whom "the SFDRR is found lacking an appropriate framing of climate change". However, it has also been noted that, compared to Hyogo, "the SFDRR has introduced a term on new risks, or the prevention of new risks, which is much closer to futuristic projections of climate scientists", ESPREssO (2017) 51; See also Murray V. et al., *Coherence between the Sendai Framework, the SDGs, the Climate Agreement, New Urban Agenda and World Humanitarian Summit, and the role of science in their implementation* (2016) 2.

55 Leitner et al. (2018) 13.

56 Leitner et al. (2018) 12; ESPREssO Project (2017) 45; UNISDR, EUR-OPA, Council of Europe (2011) 21

57 See the two real-life scenarios described in Siders A. (2016) 107–108.

58 O'Brien et al. (2008) 18; Schipper L. and Pelling M. (2006) 21–23.

59 ESPREssO Project (2017) 44

60 Few et al. (2006) 10.

61 IFRC (2013a) 6.

3

ALIGNING CCA AND DRR
RECOMMENDATIONS COMMONLY IDENTIFIED IN THE LITERATURE THAT COULD BE RELEVANT FOR LAW AND POLICY

On the basis of the considerations outlined above and drawing from the relevant academic and practitioner literature on how to achieve holistic management of climate-disaster risks (in other words "climate-smart disaster risk management"[1]), an array of previously identified recommendations can be consolidated for the use of law and policy- makers. The following section will be arranged through the identification of four main topics: a) cross-sectoral coordination and governance; b) implementation strategies; c) funding; and d) information management.

A Cross-sectoral coordination and governance

Stimulating national coordination between different ministries, agencies and platforms respectively engaged in CCA and DRR activities is widely recognised in the literature as one of the key methods for the accomplishment of effective—and context-specific—coherence.[2] Stronger and more stable inter-institutional links can result from comprehensive legislative frameworks and policies that set the stage for joint responsibilities and cross-cutting administrative procedures. Such inter-institutional links should also consider the overall amelioration of the economic conditions of the society (poverty reduction and development goals) as set out in the SDGs and the related global indicator framework.[3] Therefore, institutions responsible for budget allocation (e.g. ministry of finance and/or economic development) should be directly part of this mainstreaming effort.

The objective of strengthening coordination networks and institutions should be pursued according to the specificities of any institutional context (e.g. considering the size and type of administrative structure as well as social and economic development levels). The formulation and subsequent implementation of NAPs could play a pivotal role in this direction, as demonstrated by the adoption of joint national action plans (JNAPs)—which incorporate both CCA and DRM in a single framework - by some countries in the Asia-Pacific region.[4] Further, the same endeavour should be decentralised across sub-national authorities (regions, provinces, municipalities) with the aim of empowering local decision-makers, i.e. those directly experiencing and responding to climate change and disaster risks.[5]

In this regard, the fact that DRR national strategies could be shaped as a single coordinating framework or as "a system of strategies across sectors and stakeholder with one overarching document linking them", has been identified as a potential opportunity to increase coherence.[6] Ministries/agencies responsible for the development and implementation of NAPs and National DRR platforms would logically play a key role in this,[7] as well as Red Cross Red Crescent National Societies,[8] and other relevant civil society groups, as useful supporting entities for linking governments with community level and the most vulnerable.[9]

Political leaders, community advocates and norm entrepreneurs that could influence new reform processes and consider short- and long-term planning on risk exposures, would also facilitate greater political momentum toward a better integration. Exploring the complementarity between DRR strategies stemming from the Sendai Framework and adaptation programmes linked to the Paris Agreement requirements at both the local and national levels would allow for more consistency at the international level, e.g. providing models and good practices highlighting how the integration of CCA and DRR can be beneficial for the reduction of vulnerabilities, the implementation of international commitments and the accomplishment of the SDGs.

Better coordination should focus on injecting climate change adaptation into the activity of stakeholders throughout the whole disaster risk management process.[10] In fact, this can happen either during the design of new protection systems in the preparedness phase (e.g. Early Warning Systems) or in the aftermath of a disaster (e.g. urban re-development). The building of new infrastructures should consider climate change shifts and resilience objectives and adjust master plans, standards, and regulations accordingly.[11]

Coordination processes aimed at CCA/DRR integration should contemplate the best way to respectively connect scientific knowledge provided by experts, information management systems provided by sectoral agencies and institutions, and communication strategies to both a general audience and affected communities. Civil society and local groups should also be taken into consideration in an inclusive manner, providing for instance for the inclusion of bottom-up and local knowledge and guaranteeing that unique needs (e.g. linguistic minorities or disabilities) are duly considered.[12]

B Implementation strategies

Broadly speaking, CCA and DDR practices and objectives should be combined by means of the adoption of converging policies aimed at reducing gaps between their temporal and spatial scales. DRR assessments and implementation strategies should consider near-term climate change scenarios and enable conditions for transformative adaptation that benefit those most at risk and most in need.[13] Contextually, more aligned timeframes should be supported by norms and policies allowing the actors that promote vulnerability and risk reduction through the lens of CCA to obtain sufficient and stable access to long-term funding and implementation periods.

While a full policy integration at the global level might not necessarily be considered as a desirable outcome, as it "may undermine the ability of the various international policy-making processes to develop and pursue self-determined outcomes",[14] holistic risk management approaches should "identify and reduce actions that contribute to one set of goals, but undermine another".[15] This could be envisaged and facilitated by high-level policy dialogue in both sectors. For example, the Global Commission on Adaptation initiative provides an interesting model in this regard, putting in direct connection political visibility with concrete action tracks.[16]

However, when transposed at the country level, such dialogues should not simply focus on the development of models designed on the basis of a one-size-fits-all approach. On the contrary, they should build on existing capacities and mechanisms.[17] A certain level of flexibility should characterise the national and sub-national elaboration of new norms and projects, i.e. the capacity to target different systems of risks, vulnerabilities and ecosystems,[18] as well as different sectors and activities, and consequently involve the broadest array of stakeholders in their elaboration.

Due to the above-mentioned socio-economic implications,[19] a community-based approach should be considered as an essential component for the identification of priorities and objectives of any climate-smart risk management implementation activity, with particular regard to vulnerable and marginalised groups.[20] Cultural changes in human and societal behaviours have been considered as equally beneficial.[21] Additionally, local-level capacities and indigenous traditions and practices should be contemplated in the design and implementation of adaptive measures. This would favour the development of inclusive and sustainable solutions and livelihood resilience potential, such as "last mile" multi-hazard EWSs.[22]

"Nature-based" solutions (e.g. planting trees on riverbanks to reduce flooding risk, agricultural projects reducing soil erosion or planting coastal mangrove forests to protect human settlements from hurricanes) have also been identified as suitable opportunities to enhance CCA-DRR coherence in practice and boost societal resilience.[23]

C Funding

Monetary resources for integrated strategies could come from public budgets, international actors (multilateral and regional funds) or private donors. According to some authors, these different sources should be consistently combined, through the involvement of ministries with responsibilities for managing public finances, thus permitting an effective cost/benefit analysis and a flexible allocation to both specific activities and more long-term strategies.[24] In particular, the protection of the poorest and most vulnerable in society could be strengthened through the adoption of appropriate social protection systems and contributory schemes for the diversification and reduction of the risks.[25]

Other sources report that awareness-raising actions on the existence of multiple funding mechanisms should be considered as a means to improve access to different sources and opportunities. A major engagement of the private sector and public-private partnerships could be considered both at the national as well as international/intergovernmental level.[26]

In particular, private sector and other external funding should be promoted by public authorities as a tool to facilitate an integrated approach and diminish vulnerabilities at the community level, e.g. with regard to protection instruments such as insurance, risk transfer and credit schemes.[27] The establishment and scaling-up of pre-arranged climate disaster risk financing instruments, such as national, regional or market insurance programmes might be considered.[28]

D Information management

Governmental decision-making and related normative frameworks should be based on an adequate understanding of exposure, vulnerability and resilience, especially in light of their continuously shifting dimensions. This result should be attained through the development of more aligned monitoring processes, information management systems, and updating mechanisms which should be relevant and enable/target a diversity of stakeholders.[29] It has been suggested that a major improvement in information management could be achieved through greater access and exchange between different data sets and models, including free access and unimpeded uses through web-portals.[30]

Improved spatial and temporal coverage capacity of models on (near-term) climate change projections,[31] which address different (and even localised) time and space frames, would support climate risk assessment tools (e.g. forecast-based financing—FbF)[32], alongside the better capacity to link such data with social and economic data sets.[33] Non-quantifiable information, such as that on political stability and governance capacities, should also be considered, especially in critical areas where variations of demographic trends are likely, and conflict and security issues could raise.

Harmonised references to currently provided definitions of fundamental concepts such as risk and resilience,[34] as well as of joint indicators or metrics specifically aimed at monitoring and evaluating progress toward achieving combined adaptation and risk reduction goals, would be a major improvement.[35] To counter the lack of information and knowledge uncertainty, previous practice on scenario-based planning has proved to be a good driver for testing the implementation of new climate-smart disaster risk management and their impact on societal vulnerabilities and resilience.[36]

In order to facilitate this, the strengthening of platforms or initiatives where scientific pieces of evidence are "translated" in a timely, accessible and policy-relevant manner and to promote connections between technical experts, policy-makers and other stakeholders has been described as beneficial.[37] Traditional and experience-based knowledge provided by local actors and indigenous populations should be included, as a tool to better capture the context-specific dynamics of different risks under a changing climate.[38]

Finally, the ad hoc training of professional figures capable of interpreting risk information and translating them according to the end-user's practical needs should also be considered as a method for knowledge transfer and capacity-building among different sectors (e.g. engineering, water and sanitation, health). Specific education programmes could be part of this effort and disseminate knowledge on CCA-DRR coherence in classrooms.

OVERALL CONCLUSIONS ON THE REVIEW

This review has been drafted as a point of departure and not of arrival. It took stock of a theme that, despite a growing interest in the last 10–15 years, still appears as one of the most significant and challenging cross-cutting topics of the post-2015 global agenda. It provides a summary of the most widely cited drivers of change that could facilitate more coherence between CCA and DRR sectors, to be considered within the global framework of the SDGs.

The comparative analysis of more than 60 documents on the subject generally suggests that the objective of achieving in-country integrated and sustainable CCA-DRR settings largely depends on the adoption of normative tools. These tools would positively contribute to such outcome by enabling enhanced coordination and communication between all stakeholders, reducing duplications, optimising resources and improving effectiveness.[39] However, the literature does not provide a detailed analysis of specific normative models and standards, and empirical findings on their impact. This calls for further research to better define the role of law and policy on this subject.

As mentioned in the introduction, this review sets the scene for the conduction of new empirical research in selected countries across the globe that have experienced recent normative processes with relevance for CCA-DRR alignment. This endeavour should not strive for making normative claims about what degree or type of integration is preferable, or about the identification of a single, ideal normative model. On the contrary, it will be aimed at identifying successful practices and/or main challenges in the adoption of normative tools that strengthened resilience capacities and reduced vulnerabilities in a specific country, region or community. Ideally, these original findings will provide new benchmarks for the adoption of successful practice in other national and subnational contexts.

Balancing any future attempt to innovate laws and policies dealing with climate-related risks to the actual political and economic priorities of governments is and will remain crucial. At the same time, the concept of "social acceptance", i.e. the utmost consideration of the involved persons, through participatory approaches aimed at respecting local conditions and supporting local development, appears as one of the most relevant conditions.[40] In this direction, the above-mentioned field-trip investigations will pay particular attention to the involvement of communities and the consideration of vulnerable and marginalised group in both the development and implementation of new law and policies.

Once the findings resulting from this empirical assessment will have been analysed and processed, they will be instrumental to a twofold outcome. First, they will be presented and discussed with scholars and academic communities, with the aim of providing new transdisciplinary knowledge in this sector, pointing at synthesising a holistic and merged (rather than shared) approach.[41] Secondly, they will support the IFRC's work on "climate-smart disaster risk management laws" and the development of advocacy and guidance tools for law and policy-makers. Bearing in mind the need to link research practice with concrete normative improvement, such tools will be disseminated to support governments and other stakeholders interested in launching legislative and policy reform processes.

ENDNOTES

1 See footnote n. 15 on pg 6.

2 Global Commission on Adaptation (2019) 48–51; Leitner et al. (2018) 15–16; Abeysinghe et al (2017) 22, highlighting the role of NAP mandates in encouraging inter-ministerial collaboration; Peters K. et al., *'Resilience' across the post-2015 frameworks: towards coherence?* - Overseas Development Institute (2016) 53–54.

3 Notably, SDG 1.5 stresses the need to "build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate related extreme events and other […] environmental shocks and disasters".

4 Among the most recent and relevant practice see the second version of the 'Joint National Action Plan on Climate Change and Disaster Risk Management' (JNAP2) issued by the government of Tonga in 2018. On the role of NAPs in promoting CCA-DRR coherence see also UNDRR, *DRR4NAPs: Promoting synergy and coherence between climate change adaptation and disaster risk reduction through National Adaptation Plans* (version for comments 23 February 2019), on file with the author.

5 Christoplos I., *Incentives and constraints to climate change adaptation and disaster risk reduction - A local perspective* – Commission on Climate Change and Development, CCCD (2008) 4–5.

6 UNISDR - Global Platform for Disaster Risk Reduction 22–26 May, 2017, Cancun Mexico, *National and Local Disaster Risk Reduction Strategies Paving the Way for Action by All* - Issue Brief- Final DRAFT (2017) 6–7, 12.

7 Commission on Climate Change and Development (2009) 77;

8 IFRC, *Climate Change and the Red Cross Red Crescent* (2015) 7;

9 See Report on IFRC DRR/CCA Event: "Building local resilience in the face of rising risks: RCRC's role in the next decade" (May 2019) 10, mentioning good practices from Uganda, South Sudan, Malawi, the Philippines and Nepal.

10 Birkmann J., von Teichmann K., *Integrating disaster risk reduction and climate change adaptation: key challenges-scales, knowledge, and norms*, in 5(2) Sustainability Science (2010) 13.

11 Hallegatte et al., Lifelines. *The resilient infrastructure opportunity.* Sustainable Infrastructure Series, World Bank Group (2019) 166–167.

12 IFRC (2019) 24. For further analysis on the relevance of human rights protection in this context see Carmalt J.C., *Human Rights for Disaster Risk Reduction Including Climate Change Adaptation*, in Kelman I., Gaillard J.C., and Mercer J. (eds.) 'The Routledge handbook of disaster risk reduction including climate change adaptation' (2017) 140–149.

13 UNDRR (2019) 36, IFRC (2019) 23; IFRC (2017) 27; IFRC (2013a) 5.

14 UNFCCC (2017) 9–11, which also states that "there is substantial merit in keeping the various policy development negotiations separated, so that important issues that fall under the purview of only one agenda are still captured and given appropriate attention". See also Pearn G. (2019) 9, considering the distinction between "cooperation", "coordination" and "collaboration" in public policy and service delivery provided by Keast B., Brown K. and Mandell M., *Getting the right mix: unpacking integration meanings and strategies*', in 10(1) International Public Management Journal (2007) 9–33.

15 Ibid.

16 Global Commission on Adaptation (2019) 49–50 and 63.

17 Mitchell, van Aalst and Villanueva (2010) 20.

18 On the relevance of ecosystems in linking DRR, CCA and sustainable development, see Doswald N., Estrella M. (2015); Estrella M. and Saalismaa N., *Ecosystem-based disaster risk reduction (Eco-DRR): An overview*, in Fabrice G. Renaud, Karen Sudmeier-Rieux and Marisol Estrella (eds.) The role of ecosystems in disaster risk reduction (2013) 26–54.

19 See section 3.3 (a) above.

20 See IFRC (2019) 30, discussing the example of the Indonesian Red Cross action teams engaging with coastal communities in Demak (Central Java); O'Brien et al. (2008) 19–20. See also van Aalst M. and Cannon T., *Community Level Adaptation to Climate Change: The Potential Role of Participatory Community Risk Assessment*, in 18 Global Environmental Change (2008).

21 UNISDR, *Strategic Framework 2016–2021* (2015) 4; IFRC (2013a) 26.

22 Global Commission on Adaptation Report (2019) 18–19; IFRC (2017) 22–23; O'Brien et al. (2008) 17;

23 IFRC (2019) 23; EEA (2017) 14–15;

24 Stevenson J. R., Seville E., *Private Sector Doing Disaster Risk Reduction Including Climate Change Adaptation*, in Kelman I., Gaillard J.C., and Mercer J. (eds.) 'The Routledge handbook of disaster risk reduction including climate change adaptation' (2017); Carlarne C.P., *Disastrous Adaptation*, in Peel J., Fisher D. (eds.) The Role of International Environmental Law in Disaster Risk Reduction (2016) 147–149.

25 Hallegatte et al. (2017) 148–152; Davies et al. (2008) 7–9, mentioning as social protection programmes that could successfully support adaptation and DRR: cash transfers; weather-based crop insurance; employment guarantee scheme; asset transfers; social pensions.

26 Few et al. (2006) 11.

27 Hallegatte et al. (2017) 142–147.

28 World Bank Group – GFDRR, *The Last Mile: Delivery Mechanisms for Post-Disaster Finance* (2018); Pollner J. et al., *Disaster Risk Management and Climate Change Adaptation in Europe and Central Asia* - World Bank Group – GFDRR (2010) 27–35

29 Leiter T., *Synergies in monitoring the implementation of the Paris Agreement, the SDGs and the Sendai Framework* – GIZ (2017) 1–4; O'Brien et al. (2008) 21.

30 Hallegatte et al. (2019) 173–177; EEA (2017) 14; Leitner et al. (2018) also suggest the use of Risk Transfer and data collection by using Blockchain technology.

31 Roop K. Singh et al., *International Conference on Climate Risk Management, inputs for the Intergovernmental Panel on Climate Change's Sixth Assessment Report*, Climate and Development (2018) 3.

32 FbF is the result of an anticipatory perspective embraced by the IFRC which uses in-depth forecasting and risk analysis to anticipate disasters bringing together advanced weather forecasting and knowledge of at-risk areas. See https://www.forecast-based-financing.org/. See also Global Commission on Adaptation (2019) 63; IFRC (2017) 22–23.

33 EEA (2017) 12.

34 Siders A. (2017) 125 ; Peters et al. (2016) 42–46.

35 Siders A. (2017) 126; Peters et al. (2016), 58–60; Roop K. Singh et al. (2018) 2; Leitner T. (2017) noting that synergies can arise from connecting the different monitoring frameworks, but due to some rationale misalignments "[m]onitoring the implementation of one agreement cannot replace monitoring another". On 2 February 2017, the UN General Assembly adopted resolution A/71/644, which states the necessary indicators to measure global progress in reducing loss attributed to disasters. Synergies between different monitoring systems are already recognised by the international community: the UN Statistical Commission has confirmed indicators developed by the Inter-Agency and Expert Group on the Sustainable Development Goals, and this process is closely coordinated with the Sendai Framework (UNSTATS, 2017).

36 See Mitchell et al. (2010) 14, mentioning the example of the Mekong River Commission.

37 UNFCCC (2017) 23, mentioning the Monitoring for Environment and Security in Africa (MESA) programme established in 2010 by the African Center of Meteorological Application for Development (ACMAD) as an example of good practice to produce information materials for policy-makers by address the uncertainty of climate projections in user-friendly terms (see www.acmad-au.org). See also www.preventionweb.org.

38 See the IFRC-led initiative on *Enhanced Vulnerability and Capacity Assessment* (EVCA), updated in 2019 in order to include "climate change considerations" in the a participatory community risk assessment process (https://www.ifrcvca.org/).

39 UNFCCC (2017) 9.

40 Schmidt-Thomé (2017) 16–17.

41 See van Niekerk D., *Climate change adaptation and disaster law*, in Jonathan Verschuuren (ed) 'Research Handbook on Climate Change Adaptation Law' (2013) 154, for whom "Transdisciplinarity provides an ideal vehicle for jointly solving disaster risk reduction and climate change adaptation real world problems [whereby] the interaction with development driven problems/solutions comes into play".

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