

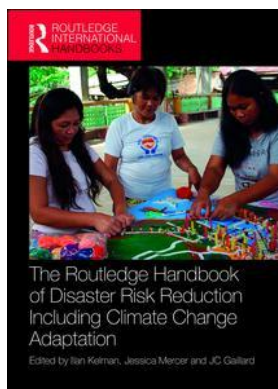
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4

CLIMATE CHANGE ADAPTATION A Critical Approach

Stavros Mavrogenis, Petros Theodorou, and Rory Walshe

Introduction

This chapter critically reviews the theory, policy and practice of climate change adaptation (CCA). 2015 was an important year for sustainable development, as three world conferences have taken place aiming to compose and reach long-term agreements for sustainability. The first was the third United Nations (UN) World Conference on Disaster Risk Reduction (third WCDRR), held from 14 to 18 March 2015 in Sendai, Japan, wherein the participants consulted on and formed the successor to the Hyogo Framework for Action (HFA) which is called the Sendai Framework for Disaster Risk Reduction (SFDRR). Following this, the UN ratified the Sustainable Development Goals (SDGs) in September in New York, which are replacing the Millennium Development Goals established in 2000 (UN 2000). The United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) rounded off 2015 in December, in Paris. The purpose of the Paris COP was to produce a binding agreement for the reduction of greenhouse gas emissions to address climate change.

These policy processes straddle the concerns of CCA, disaster risk reduction (DRR) and sustainable development. As a discipline DRR is older than CCA, but both were preceded by activities grouped thematically as ‘poverty reduction’, now known broadly as ‘sustainable development’. The aims of DRR and CCA are linked since for both, poverty reduction and sustainable development are essential components of vulnerability reduction. Indeed, CCA and DRR are integral to several of the recently ratified SDGs, particularly goals 13 (climate action) and 11 (sustainable cities and communities). Kelman *et al.* (2015) use the Paris COP to highlight the interconnectedness among these three processes as well as the inter-dependency of the outcome of each process on the others. Despite these similarities and overlaps the three processes are separate and independent, which as Mercer *et al.* (2012) note, is limiting and illogical given that they aim to address and examine similar processes regarding vulnerability and resilience, and to improve methods to anticipate, resist, cope with and recover from hazard impact.

As well as their aims, DRR and CCA also share ‘mutual benefits’, in that DRR already attempts to reduce climate-related disaster risk and, increasingly, to offset long-term impacts of climate change (Kelman *et al.* 2015). Therefore, in order for CCA to be effective, it must build on and be embedded within DRR, and should not be undertaken in isolation from this wider agenda (Sperling and Szekely 2005). Nevertheless, including all three issues, namely DRR, CCA and

sustainable development, in a unique, common agenda is a difficult task due to academic and institutional entrenchment (Kelman *et al.* 2015).

The SDGs may not be achieved if disaster risk is ignored. In an interconnected world, the losses incurred from disasters affect individuals, critical public infrastructure and ecosystems as well as the broader economic and increasingly complex environment in which the public and private sectors operate. Consequently, a priority for policy could also be to incorporate both DRR and CCA within core strategy and programme objectives in a more holistic approach for achieving sustainability. Hewitt (1983) and Lewis (1999), among others, laid the foundation for justifying this approach when evidencing that all disasters, climate related or otherwise, hinder development. Critically, they assert that it is the root causes contributing to these disasters that need to be adequately addressed.

Adaptation Theory

The concept of a ‘disaster’ is often associated with the insufficient capacity, or disinterest, of existing national and local systems to reduce a population’s vulnerability (Glantz 1976; Hewitt 1983; Lewis 1999; Wisner *et al.* 2004). Too many disasters are rooted in corruption, the misuse of available resources, the looting of natural and economic resources to benefit the most powerful and a lack of enforcement or disobedience of laws such as building codes.

The Intergovernmental Panel on Climate Change (IPCC 2014, pp. 119–120) defines climate as ‘the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years’ and climate change as an alteration 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’. It goes on to specify that climate change ‘may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use’. It is important to note that this differs from the UNFCCC (1992) definition, which specifically attributes climate change to direct or indirect human activity and distinguishes this from climate variability attributable to natural causes.

Climate change is increasingly utilised as a ‘catch all’ phrase assigning blame for many disasters (Kelman *et al.* 2015; Mercer 2010). Yet, climate change is just one factor amongst many that has the capacity to influence hazard parameters. Furthermore, it is relatively easy to accept climate change as a problem, and to blame climate change for problems experienced, without accepting responsibility for one’s own actions at an individual, community, institutional, or governmental level. The existing debate supports the assertion that a vast wealth of knowledge in relation to ‘adapting to change’ and ‘dealing with disaster’ is not currently utilised to maximum effect (Mercer 2010). Therefore, encompassing successful CCA within the wider contexts of DRR, development and sustainability remains a challenge (Gaillard 2013; Kelman *et al.* 2015; Mercer 2010).

It is also acknowledged by Gaillard (2013) that a focus on climate change has been used by governments of less wealthy countries as a scapegoat for the root causes of vulnerability to disasters. Gaillard (2013, p. 222) explains that marginalisation (geographic, social, economic, and political) is instead the crucial element of vulnerability.

CCA in the IPCC’s Fourth Assessment Report was defined as (2007, p. 869):

- Adaptation – Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation.

- Anticipatory adaptation – Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.
- Autonomous adaptation – Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.
- Planned adaptation – Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

More recently, the IPCC (2014, p. 118) provided a complicated set of vocabulary regarding adaptation to climate change. It defines adaptation as

[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.

This represents a departure from the 2007 IPCC definition in terms of the breadth and focus. Namely, the 2014 definition differentiates between adaptation for human and natural systems; however, the separation of natural and human systems is misleading because they are already connected. Nature has been ‘socialised’ and there is no nature without human presence (for the concept of socio–nature see Castree and Braun 2001).

The definitions for anticipatory and planned adaptation that were present in the 2007 report were removed from the 2014 report. However, the definition for autonomous adaptation remains:

Autonomous adaptation – Adaptation in response to experienced climate and its effects, without planning explicitly or consciously focused on addressing climate change. Also referred to as spontaneous adaptation.

(IPCC 2014, p. 1759)

This is a significant change in the definition of autonomous adaptation from 2007, which moves beyond only considering the ‘ecological changes in natural systems and by market or welfare changes in human systems’ (IPCC 2007, p. 869). This narrow definition excluded a variety of reactions related to human conservation and other societal changes.

Another issue that shapes CCA is its relationship with mitigation. Article 3.3 of the UNFCCC (1992) states that ‘[t]he Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects’. Adaptation is not defined in a clear way but is implied by the term mitigation. Eventually, these two terms were separated in the UNFCCC process and came to have different meanings. This was a development that harmed the main goal of the climate change agenda since most CCA projects, such as reforestation, installing photovoltaic panels, and education can be both adaptation and mitigation actions by climate change definitions. On the other hand, hard engineering adaptation measures such as coastal walls and breakwaters require a lot of energy in order to be constructed and maintained, so CCA can interfere with climate change mitigation.

The top-down approach of CCA policies is one of the main reasons for these kinds of malpractices. Local communities are excluded from the decision-making process and their voice is not heard regarding the expression of their needs and their knowledge on CCA. Irrespective of

various terms, overlaps and confusion it is clear that CCA is needed to deal with human induced climate change (Mavrogenis and Kelman 2013).

International Governance of Adaptation: The UNFCCC Process

CCA emerged in the UNFCCC, which was signed in 1992. Articles 2 and 3 of the UNFCCC (1992) clearly state that the parties to the Convention are obliged to stabilise greenhouse gas emissions in order to ‘prevent dangerous anthropogenic interference with the climate system’ (Article 2). Thus, the UNFCCC forms the pillars of international climate change governance, focusing on mitigation but nonetheless referring to adaptation four times throughout the text (UNFCCC 1992; see also Bodansky 1993). In fact, Article 4 places specific obligations on the countries labelled as ‘developed’ to share the cost of adaptation measures in the countries labelled as ‘developing’. Article 3.1 states that developed countries and emerging economies should undertake all the necessary measures to combat the adverse impacts of climate change, while Article 3.2 describes how these measures should take the vulnerabilities of developing countries under consideration.

Article 4.1 is especially important for adaptation governance. It requires that member states have to plan, implement, publish, and amend national plans for combating climate change, including adaptation measures. Article 4.3 of the UNFCCC (1992) refers to the financing of adaptation measures in which developed countries must provide ‘new and additional financial resources to meet the agreed full costs incurred by developing country Parties’. The onus is especially on developed countries to act given ‘the developing country Parties that are particularly vulnerable to the adverse effects of climate change’ according to Article 4.4.

Despite identifying the more affluent countries as the cause of human-induced climate change, the language of the UNFCCC lacks clarity and specificity. In this context, the COPs have resulted in a series of agreements (Table 4.1). To some extent, the lynchpin of the UNFCCC was the Kyoto Protocol (UNFCCC 1998), an internationally binding agreement that committed wealthier countries ‘to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012’. The Kyoto Protocol entered into force in February 2005, yet many of the countries that have ratified it have still not met the targets to which they agreed.

Table 4.1 Summary of Milestones from UNFCCC COPs and the EU

<i>Milestone</i>	<i>Year</i>
UNFCCC’s article 4 makes direct reference to adaptation	1992
COP3 resulted in the Kyoto Protocol	1997
COP7 the Marrakesh Accords established the National Adaptation Programmes of Action (NAPAs), the Least Developed Country (LDC) Expert Group, the LDCs Fund, and the Adaptation Fund	2001
COP12 established the Nairobi Work Programme in Impacts, Vulnerability and Adaptation to climate change (NWP)	2006
COP13 established the Bali Action Plan (BAP) and officially launched the Adaptation Fund	2007
The European Commission launched the Green Paper on Climate Change Adaptation	2007
The European Commission published the White Paper ‘Adapting to climate change: Towards a European framework for action’	2009
COP15 tried to secure unsuccessfully a successor to the Kyoto Protocol	2009
COP16 established the Cancun Adaptation Framework and the Green Climate Fund	2010
The European Commission adopted the ‘EU Strategy on adaptation to climate change’	2013
COP21 Paris Agreement	2015

CCA started emerging as a key concern within the UNFCCC during the previous decade (2000–2010). COP7 in Marrakesh delivered the opportunity for LDCs to develop National Adaptation Programmes of Action (NAPAs). This was built upon by COP12 in Nairobi, with the introduction of the 5-year (2005–2010) Nairobi Work Programme (NWP) on Impacts, Vulnerability and Adaptation to Climate Change for the LDCs and the UN-designated Small Island Developing States (SIDS). Therefore, both the Marrakesh and Nairobi COPs were significant first steps that have tried to ensure the scientific basis of adaptation actions and to catalyse action on adaptation.

In December 2007, COP13 in Bali resulted in a few notable developments regarding adaptation. The Adaptation Fund was identified as a particularly important financial mechanism for CCA, as it gave the recipient countries more confidence in its operations, reducing bureaucracy and facilitating bottom-up CCA (Kelman and Mavrogenis 2014). Additionally in Bali, in an attempt to coordinate CCA with DRR approaches, a number of adaptation plans were implemented both in Africa and the SIDS. This effort essentially acknowledges DRR and risk management as major elements of CCA. Yet, it was done without fully recognising what DRR could offer CCA, and how CCA sitting within DRR would bring together the two concerns more coherently and effectively.

Following the highly anticipated yet ultimately ineffectual COP15 in Copenhagen, COP16 in Cancun in 2010 resulted in the establishment of the Cancun Adaptation Framework. Cancun also delivered the Green Climate Fund, a multilateral financing entity with the mandate to serve the UNFCCC in delivering equal amounts of funding to less wealthy countries for both adaptation and mitigation. However, the fund has hitherto received little support and developed states seem reluctant to transfer their money to the fund.

Additionally, the agreement from COP16 introduced the possibility for compensation in case of losses attributed to climate change, continuing the debate about whether or not compensation for impacts could count as adaptation. Finally, for the first time in international adaptation governance, an Adaptation Committee (AC) was founded in order to coordinate the implementation of international adaptation. In October 2014, at its 6th meeting, the AC agreed to include several recommendations in its report to the COP20 in Lima – in particular, to ‘encourage the Adaptation Fund, the Global Environment Facility and the Green Climate Fund to consider and integrate local, indigenous and traditional knowledge and practices into adaptation planning and practices, as well as procedures for monitoring, evaluation and reporting’ (Adaptation Committee 2014, p. 2).

In COP21 the international community adopted the Paris Agreement, a legally binding text with the main goal of keeping the increase in global average temperature (above pre-industrial levels) to well below 2°C and at the same time attempting to limit the increase to 1.5°C (UNFCCC 2015). Parties presented their ‘intended nationally determined contributions’ – INDCs which are effectively voluntary targets – covering 5- or 10-year periods starting in 2020. Starting from 2023, governments will come together every five years in a ‘global stocktake’, based on the latest science and implementation progress to date. The stocktake will set the context for the raising of ambition by all Parties by looking at what has been collectively achieved and what more needs to be done to achieve the below 2°C objective. There is no punitive mechanism in the Paris Agreement but a set of procedures such as technical expert reviews, a multilateral peer review process, and a standing committee on implementation and compliance will evaluate the progress of the implementation. In conclusion, the Paris Agreement sets ambitious goals but it is up to states to fulfil their commitments and pledges.

National and Multinational Governance Regimes for Adaptation

In 2001 at COP7 in Marrakesh, the NAPAs (specifically for LDCs) entered into force in the context of the ‘Marrakesh Accords’. The basic feature of NAPAs is that they provide the opportunity for LDCs to develop their own CCA priorities and to propose solutions based on

their own needs and capacities. In this sense, they are designed to summarise and build on existing strategies and knowledge, identifying adaptation actions that are based in communities. In practice however, many NAPAs were produced by external consultants with varying degrees of local, on-the-ground input (Kelman and Mavrogenis 2014). Post-Marrakesh COPs continued to support NAPAs, mainly by mainstreaming NAPAs into developing planning and revising NAPAs.

As of August 2013, the UNFCCC Secretariat had received NAPAs from 49 out of the 50 LDCs that received funding for preparing the document. Despite the fact that the Least Developed Countries Fund (LDCF) is currently the primary source that LDCs can tap into for NAPAs, and although 97 NAPA-related projects had been approved for funding as of April 2013, there remains a lack of clarity regarding by whom and how they will be implemented (Huq and Khan 2006). In fact, the progress report on the LDCF in 2013 pointed out that the supply of resources for adaptation continued to fall far short of the current and projected demand, and adaptation finance remained unpredictable. This consequently provides vulnerable countries with limited opportunities and incentives to invest in longer-term capacity building, institutional frameworks, planning and investments. Furthermore, as Kalame *et al.* (2011) note, few NAPAs have been implemented, with existing successes due to effective inter-ministerial mainstreaming of adaptation into development planning. Lastly, institutional barriers as well as the exclusion of marginalised and more vulnerable groups from participatory processes have been highlighted as key constraints in the NAPA processes (Huq and Khan 2006).

In most of the LDC countries that have submitted NAPAs, the UNFCCC has been influential in pushing the adaptation agenda forward (Juhola 2010). In Europe, the EU members have been developing their own CCA strategies. In some countries, such as the UK and France, extreme weather events have influenced the policy agenda, underscoring the vulnerabilities of societies to current weather. In contrast, more long-term concerns, such as sea-level rise, have been a driving force in the Netherlands (Peltonen *et al.* 2010). Nevertheless, the EU is shifting towards a more coherent regional approach, including connections with other common policies, such as the Common Agricultural Policy (CAP) and the Common Fisheries Policy (CFP), in order to support and promote multinational governance of adaptation.

Community-based Adaptation and Ecosystem-based Adaptation in SIDS: Putting the Communities in the Driving Seat

SIDS are said to be one of the most vulnerable groups in the world to the adverse impacts of climate change (IPCC 2014). IPCC (2014) suggests that SIDS will experience significant sea level rise over the next 100 years and some portions of land could be inundated. Other major impacts of climate change might occur such as changing weather, saltwater intrusion into groundwater that leads to land erosion, and freshwater shortages. SIDS societies will face impacts of climate change and if migration scenarios play out, which is not certain, then potential loss of languages, identities, and cultures could result.

Adapting to climate change without integrating traditional and local knowledge might lead to failure and malpractices (Mercer *et al.* 2012). The most recent literature on DRR and CCA converges to this point, with DRR continuing to integrate bottom up, 'grassroots' strategies with appropriate top-down approaches, as it has long advocated. While CCA emerged from top-down policy and was initially largely disconnected from communities (Mercer 2010), CCA is also increasingly appreciating the value of community-based and bottom-up approaches and therefore could learn valuable lessons from DRR. Consequently, a more holistic approach should be adopted in terms of enhancing the synergies between DRR and CCA, preferably

through placing CCA as a subset of DRR, and also combining scientific and local knowledge. Community-based Adaptation (CbA) and Ecosystem-based Adaptation (EbA) might address this point.

Reid *et al.* (2009, p.13) define CbA as ‘a community-led process, based on communities’ priorities, needs, knowledge and capacities which should empower people to plan for and cope with the impacts of climate change’. Therefore, CbA focuses largely on supporting people to help themselves towards CCA. EbA is an approach that helps people adapt to the adverse impacts of climate change by using biodiversity and ecosystem services to their advantage (Marshall *et al.* 2010; Pérez *et al.* 2010). EbA promotes sustainable management and conservation and restoration of ecosystems, taking into account anticipated climate change impacts, to increase the resilience of ecosystems and people (Renaud *et al.* 2013; Mercer *et al.* 2012).

CbA tools for climate change only recently entered the academic discourse and focus largely on empowerment within communities. Kelman *et al.* (2009, p. 52) adopt the ‘guided discovery’ framework as a four-step process that leads to establishing long-term cooperative partnerships between communities and collaborators outside the community at national, regional and international levels. Its main strength is that it recognises scientific and local knowledge as resources for successful strategies for vulnerability reduction. Thus, the main issue that CbA methodologies should address is the possibility of integrating bottom-up and top-down activities. A major gap in CCA (e.g., Mercer 2010 amongst others) is that development practitioners can reject or be unaware of scientific knowledge, while scientists that consider themselves experts often do not engage with practitioners.

Many NGOs are using CbA and EbA to try to fill that gap by conducting research on and implementation of CbA and EbA tools (see Marshall *et al.* 2010; Pérez *et al.* 2010). Marshall *et al.* (2010, pp. 28–29) provide a synthesis of CbA toolkits. In their gap analysis of EbA in the Caribbean, Mercer *et al.* (2012, p. 1924) point out that ‘EbA activities are often not differentiated from non-EbA activities, instead recognising adaptation as happening or being needed, with some aspects involving or related to ecosystems and other aspects not’. Boxes 4.1, 4.2, and 4.3 summarise the applicability of CCA measures in SIDS and non-SIDS countries.

Box 4.1 Ecosystem-based Adaptation in Tonga

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Based on Mavrogenis and Kelman (2013).

For Tonga, successful community-based EbA means linking ecosystems and local livelihood benefits. A key message is that showing the community the benefits from EbA creates local buy-in leading to behavioural change and sustainability. When the benefits derived by the community from mangroves were shown (e.g., reduced storm damage and livelihoods support), people dumped less waste into the mangroves. Locals saw that their livelihoods would gain from ecosystem restoration, so they did the work themselves. The youth were motivated because the revenues from EbA helped them to improve their own livelihoods. Meanwhile, women were supported through an empowerment project encouraging women to lead, which then motivated the women to continue the EbA activities.

Box 4.2 Community-based and Ecosystem-based Adaptation in Seychelles

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The government of the Seychelles has demonstrated a strong commitment to fighting climate change, and in 1992 was the second country in the world to sign the UNFCCC. Two months later, the country established a national commission for coordinating, developing, and implementing a national plan on climate change, for acting as an intermediary between the national plan and the government, and for preparing national communications to the UNFCCC. The country's national strategy for climate change has the main goal of minimising climate change impacts through coordinated and preventative action at all levels of society – deliberately connecting the local, national, and international. The Seychelles' national adaptation strategy has already achieved institutional governance and community engagement through a series of open public consultations. Integrating top-down and bottom-up approaches has ensured progress on CCA despite the problems of funding, slow exchange of knowledge and technology, and the continued marginalisation of SIDS.

Box 4.3 Climate Change Adaptation in the EU

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In 2007, the European Commission launched a consultation by publishing a Green Paper on CCA in Europe (European Commission 2007). Two years later, building on this consultation, it published a transitional policy paper – the White Paper 'Adapting to climate change: Towards a European framework for action' (European Commission 2009). In April 2013, the Commission adopted the 'EU strategy on adaptation to climate change' (European Commission 2013) aiming at the provision of specific steps for implementing EU adaptation policies. This strategy aims to provide more specific steps for implementing EU adaptation policies. Whereas the EU members have been developing their own national CCA strategies, the EU is now moving towards a more coherent regional approach including connections with other common policies such as the Common Agricultural Policy (CAP), the Cohesion Policy, the Common Fisheries Policy (CFP) and the Blue Growth Policy to better support multinational governance of adaptation. See also Table 4.1.

A good example of integrating CbA and EbA into the national CCA agenda is what the Seychelles accomplished in recent years (Box 4.2).

EbA is a major opportunity for adaptation at the community level – especially for the world's most vulnerable communities. It addresses many of the existing concerns and priorities of these communities. Consequently, CbA may be a useful vehicle for implementing EbA at the community level.

Local communities will have to adapt to climate change due to the slow pace of the international climate negotiations, as they have always had to adapt to changes in the environment, irrespective of international environmental negotiations and treaties. Adapting to a changing climate requires that communities be put in the driving seat and lead the CCA actions. CbA and EbA are useful tools in implementing this approach, although these actions should not be narrowly applied at the local level, but should also attempt to cross over into national and regional levels as well.

In non-SIDS countries CCA strategies are often national policies that follow the top-down or managerial approach. The EU countries, for example, develop their own adaptation strategies that promote mainstreaming of adaptation into other national policies, from the national level to local level. However, EbA is not considered as a separate adaptation policy but usually part of biodiversity conservation strategies.

Conclusions

This chapter has reviewed theory, policy, and practice for CCA, demonstrating how it sits well within DRR. In theory, this process can be heavily top-down. First, developing the theoretical framework, then mainstreaming it into international and national decision-making processes, and finally practising various models on the ground. Yet, people and communities have been adapting for centuries in climates that have always had variability, trends, and changes. It is true that today's climate change is a result of human intervention but this does not change the fact that environmental change is an ongoing process, which has forced humankind to cope with it throughout history.

The international community of scientists, decision-makers and practitioners over the last few years has increasingly rejected the assumption that implementing adaptation is either a top-down or a bottom-up approach, but instead is a process that should combine both as well as internal/external knowledge and local/external support. Community-based and ecosystem-based adaptation overlap and target the same goals: full and fair access to resources in order to secure livelihoods for local communities to thrive in and live with their environment. Communities are the most genuinely viable element of sustainable development. Therefore, communities should be at the centre of CCA policies, both external and on the ground. This means that in order to achieve the ideal of 'putting communities in the driving seat' the communities themselves should have a say in defining and applying CCA according to their needs.

Global environmental change affects everyone's lives and therefore CCA actions can and should start now. The urgency of mainstreaming and implementing CCA might bridge the gap between theory and practice and in this manner may help to overcome local and external elites who use climate change as a scapegoat in order to perpetuate their power and malpractices that eventually result in environmental degradation. Climate change is part of the wider environmental change processes that already provoke numerous challenges and opportunities at global and local scales, including with respect to food, energy, water, and natural hazards. Therefore, CCA is part of the development process that addresses the aforementioned challenges and is not a separate domain.

Furthermore, in view of the similarities to exploit and the differences to account for between CCA and DRR, there have been increased calls to integrate CCA into DRR (e.g., Kelman *et al.* 2015). Kelman *et al.* (2015) further suggest that while CCA should be subsumed within DRR, DRR should be integrated within sustainable development. Both DRR and CCA prioritise their particular framing of issues, and neglect those outside of it, yet the largest development challenges

are often the result of neither disasters nor climate change and are instead a complex combination of development and poverty issues on many scales across space and time.

The IPCC and the UNFCCC processes are the pillars of CCA that represent a science and policy driven approach of dividing climate change from the development discourse into something separate. The recent milestones of the SDGs, the Paris Agreement, and the SFDRR all point in the same direction. Integration of the three realms based on the people's needs will assist in achieving sustainable livelihoods on the people's own terms without causing problems for others.

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