

SECTION 10

CLIMATE CHANGE

CHANGEMENT CLIMATIQUE

CHAPTER 31: ASPECTS OF INTERNATIONAL CLIMATE CHANGE LAW AND POLICY FROM AN AFRICAN PERSPECTIVE¹

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1 Introduction

Climate change poses enormous challenges on mankind, *de facto* and *de iure*. Various intersections of law are related to climate change and an interdisciplinary approach to climate change is required to cope with the challenges ahead, as there is no clearly demarcated field of climate change law. Intersections can be found between environmental law, human rights law, the law of the sea and world trade law among others. Without doubt, the endless ramifications of climate change preclude any claim to exhaustiveness. However, many major legal issues have emerged, and build up what can be considered as an international framework for climate change law and policy. Developments in the past years reflect that climate change is playing a more dominant role, especially in the field of policy making and national planning. Based on local and national commitment and efforts to deal with the risks and challenges related to climate change and on international cooperation, a broad variety projects in the field of climate change have been and are being initialised and emphasise the importance of climate change mitigation and adaptation.

During the past centuries the world's population increased rapidly to over 7.6 billion in 2017 and a global population of 9.7 billion people is projected for the year 2050.² The expansion of mankind, both in numbers and per capita exploitation of the earth's resources, has been astounding. In an age primarily shaped by people, the so-called *Anthropocene*,³ the depletion of natural resources, the transformation of land

1 This chapter is partially based on Ruppel (2016).

2 According to the 2017 Revision of the United Nations World Population Prospects, UNDESA (2017).

3 The term has initially been coined in 2000 by the famous atmospheric chemist and Dutch Nobel Prize winner Paul Crutzen and has ancient Greek roots: *anthropo* meaning *human* and *cene* meaning *new*. In 2000 Crutzen realised that we live in an age primarily shaped by people and that anthropogenic drivers have become major factors regarding the changes of our planet Earth. Crutzen suggested this age be called *Anthropocene* – “the age of man”. See Crutzen & Stoermer (2000).

surface by human action, and the increase in atmospheric concentrations of carbon dioxide are some of the impacts of human activity on Earth and atmosphere.

2 Why is Africa particularly vulnerable to the impacts of climate change?

The African continent, in particular sub-Saharan Africa, is one of the poorest in the world despite being richly endowed with natural resources. Approximately 45% of the total SADC population lives on US\$1 per day. In 2016, the prevalence of under-nourishment across Africa is around 16.2%, ranging from less than 5% to over 47% in some African countries. The prevalence of stunting among children under 5 years of age amounts to 33% across Africa and over 50% in some African countries. The incidences of malaria per 1,000 population amounted to 222 in 2013. Infant mortality rates remain above 50 per 1,000 births across Africa.⁴ These figures are indicative of the harrowing and impoverished conditions afflicting most peoples on the continent and especially in sub-Saharan Africa.

Various regions of Africa have experienced changes in weather patterns over recent years, especially concerning the occurrence of droughts and floods. This has led to property destruction, loss of crops, livestock and settlements, as well as to forced human displacement, all of which have exacerbated already grinding poverty. Vulnerability to climate change⁵ relates not only to a change in the frequency or duration of climatically unusual conditions, but also to the capacity to respond adequately to such conditions. Two aspects of vulnerability can be distinguished. The first concerns the likelihood that an individual or group will be exposed to and adversely affected by altered climatic conditions. The second aspect of vulnerability relates to the capacity to anticipate, cope with, resist and recover from the impacts of climate change. This capacity to adapt to climate change obviously varies among regions and socio-economic groups, in the sense that those with the least capacity to adapt are generally the most vulnerable to the impacts of climate change. This, to a great degree, speaks to the nature and abundance of the resources available to a given group, individual or region, to mitigate, overcome or adapt to altered climate conditions. Climate change has an impact on socio-economic development, and it affects various sectors crucial to such development – water availability, forestry, agriculture, biodiversity, food security and human health. Human vulnerability has become a key focus of human rights discussions, which now also tend to focus on how flooding, dev-

4 All figures from AfDB (2017).

5 The IPCC defines vulnerability as the “propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.” IPCC (2014:128).

astated housing, changes in the supply of fresh and irrigation water, contagious diseases, prolonged droughts, forced migration, deforestation, soil denudation, etc., will impact on human lives.

Projected consequences of continued temperature increases include a rise in sea levels, changes in precipitation patterns, and the resultant threat to food security and sustainable development in general, with more people pushed into and caught in poverty, especially in developing countries with fragile economies. It is expected that the 'water side' of climate change is likely to generate a significant impact on national and global economies; and it is not unlikely that this will result in increased local and international conflict, particularly in Africa.⁶ This may also affect the energy production sector, as water is closely connected to the generation of electricity. An important question repeatedly posed is whether an increase in hydro-electric and nuclear electricity generation will have the required effect of a decrease in greenhouse gas emissions. In fact, the increased water requirements of these kinds of energy generation – to run turbines and for cooling – might exacerbate pressures on already strained water reserves and create new constraints. The interconnectedness and interdependence of water, energy, national welfare and international economies becomes clearer as climate change progresses around the world.

Moreover, the potential consequences of climate change and a decrease in fresh water also pose challenges for animal and plant species and biodiversity,⁷ which in turn is likely to influence the human food chain.⁸ All these considerations call for global level scrutiny and perhaps for a new and global green deal⁹ that reassesses development in a carbon-constrained¹⁰ and water-stressed world.

Various studies highlight the vulnerability of Africans that depend primarily on natural resources for their livelihoods, indicating that their resource base – already severely stressed and degraded by overuse – is expected to be further adversely affected by climate change.¹¹ Populations already vulnerable as a result of their status – women, children, the aged, minorities and the disabled – will be feeling the effects of climate change the hardest.¹²

Women in Africa are especially exposed to climate change related risks due to existing gender discrimination, inequality and inhibiting gender roles.¹³ Elderly women and girls are expected to be most severely affected. Women are vulnerable to gender-

6 Scholtz (2010).

7 Hinz & Ruppel (2010).

8 Erens et al. (2009:207).

9 Barbier (2010).

10 Palosuo (2009).

11 (ibid.:85); Leary et al. (2006).

12 Ruppel (2010a).

13 Ruppel (2010b).

based violence during natural disasters and during migration, and girls are more likely to drop out of school when household incomes and resources come under stress. Rural women are expected to bear the brunt of considerable negative effects on agriculture and deteriorating living conditions in rural areas. This vulnerability is exacerbated by factors such as unequal property rights, exclusion from decision-making and difficulties in accessing information and financial services.

With regard to African children, climate change is expected to increase existing health risks and to undermine support structures that protect children from harm. Extreme weather conditions and scarcity of safe drinking water are major causes of malnutrition and infant and child mortality in Africa. Likewise, increased stress on livelihoods will make it more difficult for children to attend school. Girls will be particularly adversely affected as traditional household chores, such as collecting firewood and water, require more time and energy when resources are scarce.

Climate change also poses a threat to indigenous peoples in Africa, who often live in marginal lands and fragile ecosystems, which are particularly sensitive to changes in weather.¹⁴ Climate change could become a driver of migration and population displacement and it is acknowledged that indigenous people living in dry-lands are among the most vulnerable communities, as a result of water scarcity. Indigenous peoples have been voicing their concerns about the impacts of climate change on their rights as distinct peoples, and the importance of giving them a voice in policy-making on climate change at both national and international levels; further, to take into account and to build on their traditional knowledge. Customary law¹⁵ and indigenous knowledge should therefore be incorporated into climate change policies in order to foster the development of cost-effective, participatory and sustainable adaptation strategies.¹⁶

Populations whose rights are poorly protected are likely to be less well-equipped to understand or prepare for climate change; they would be less able to lobby effectively for Government or international action; and are more likely to lack the resources needed to adapt to expected change in their environment and economic situation. The efforts that have been made so far to place rights at the centre of any future climate change-mitigating dispensation have not been human rights focused. However, human rights impacts are a relevant concern. To mobilise the policy value, and indeed the legal force, of human rights in the construction of a climate change mitigating dispensation, requires the assessment of likely human rights impacts and outcomes of climate change. The specific rights potentially affected by climate change, such as rights to food, water, shelter, and health or rights associated with gender,

14 Cf. studies on biodiversity in Hinz & Ruppel (2008).

15 Ruppel (2010c).

16 Mfune et al. (2009).

children and indigenous peoples, must be addressed in context. Each of the human rights¹⁷ affected by climate change need to be identified and addressed in order to infuse relevance into on-going consultations, political negotiations, global cooperation discussions and other actions, whether internationally, regionally and nationally.

Rights and responsibilities regarding the utilisation of environmental resources need to be distributed with greater equity among communities, both globally and nationally. In this context, political participation, access to information and broad public involvement are just as important to the realisation of human rights as the development of quality climate change related education and interdisciplinary research of high standard. In order to become a winner – rather than a loser in the face of climate change – Africa needs more highly skilled experts in this field in order to meet future demand and to be in a position to adequately negotiate around its international interests in a growing and complex, knowledge-based global economy.¹⁸

3 The Intergovernmental Panel on Climate Change (IPCC)

It is the ultimate role of the IPCC to assess – on a comprehensive, objective, open and transparent basis – the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.

In 2014, the IPCC has launched its *5th Assessment Report (AR5) on Climate Change*,¹⁹ with the contribution by Working Group I on *The Physical Science Base*, the contribution by Working Group II on *Impacts, Adaptation and Vulnerability*, and the contribution by Working Group III on *Mitigation of Climate Change*. In its report, the IPCC has again most rigorously reviewed and assessed the most recent scientific, technical and socioeconomic information produced worldwide relevant to the understanding of climate change.

The aforementioned reports are of great relevance with regard to all aspects of climate change and contain a solid base for further debate on this important topic. A general message from the reports can be summarised as follows: there is no doubt that we live in a world which is altered by climate change, one of the greatest challenges of the 21st century. Climate change poses risks to human and natural systems and has the potential to impose additional pressures on the various aspects of human security.²⁰ The risks and impacts related to climate change can be reduced by im-

17 Ruppel (2008a and b).

18 Ruppel (2010a).

19 Report available from <http://www.ipcc.ch/report/ar5/>, accessed 28 May 2018.

20 Adger & Pulhin (2014:760).

proving society to decrease vulnerability and hand down the overall risk level (adaptation²¹) and by reducing the amount of climate change that occurs, particularly by decreasing emissions (mitigation²²). AR5 concludes that²³

human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.

Evidence shows that the atmosphere and ocean have warmed, the amounts of snow and ice have diminished and sea level has risen and there is no doubt that human influence has been the dominant cause of the warming observed since 1950.²⁴ Climate change has caused widespread and consequential impacts on all continents and across the oceans and poses a broad range of future risks for human and natural systems.²⁵ The IPCC's analysis of observed climate trends and future projections reveals that that it is very likely that mean annual temperature has increased over the past century over most of the African continent,²⁶ and that temperatures on the continent will rise faster than the global average increase during the 21st century.

3.1 The IPCC's main findings for Africa

Selected Executive Summary Statements of the IPCC AR5 Africa Chapter²⁷

Evidence of warming over land regions across Africa, consistent with anthropogenic climate change, has increased (high confidence). Decadal analyses of temperatures strongly point to an increased warming trend across the continent over the last 50 to 100 years.

Mean annual temperature rise over Africa, relative to the late 20th century mean annual temperature, is likely to exceed 2°C in the Special Report on Emissions Scenarios (SRES) A1B and A2 scenarios by the end of this century (medi-

21 Adaptation is defined as “The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.” See IPCC (2014:118).

22 Mitigation of climate change is defined as “A human intervention to reduce the sources or enhance the sinks of greenhouse gases.” See IPCC (2014:125).

23 See IPCC (2014:2).

24 (ibid.).

25 (ibid.:6).

26 With the exception of areas of the interior of the continent, where the data coverage has been determined to be insufficient. See Niang & Ruppel (2014:1206).

27 Taken from Niang & Ruppel (2014:1202-1204).

um confidence). Warming projections under medium scenarios indicate that extensive areas of Africa will exceed 2°C by the last 2 decades of this century relative to the late 20th century mean annual temperature and all of Africa under high emission scenarios.

A reduction in precipitation is likely over northern Africa and the southwestern parts of South Africa by the end of the 21st century under the SRES A1B and A2 scenarios (medium to high confidence). Projected rainfall change over sub-Saharan Africa in the mid- and late 21st century is uncertain.

African ecosystems are already being affected by climate change, and future impacts are expected to be substantial (high confidence). There is emerging evidence on shifting ranges of some species and ecosystems due to elevated carbon dioxide (CO₂) and climate change, beyond the effects of land use change and other non-climate stressors (high confidence). Ocean ecosystems, in particular coral reefs, will be affected by ocean acidification and warming as well as changes in ocean upwelling's, thus negatively affecting economic sectors such as fisheries (medium confidence).

Climate change will amplify existing stress on water availability in Africa (high confidence). Water resources are subjected to high hydro-climatic variability over space and time, and are a key constraint on the continent's continued economic development. The impacts of climate change will be superimposed onto already water-stressed catchments with complex land uses, engineered water systems, and a strong historical socio-political and economic footprint. Strategies that integrate land and water management, and disaster risk reduction, within a framework of emerging climate change risks would bolster resilient development in the face of projected impacts of climate change.

Climate change will interact with non-climate drivers and stressors to exacerbate vulnerability of agricultural systems, particularly in semi-arid areas (high confidence). Increasing temperatures and changes in precipitation are very likely to reduce cereal crop productivity. This will have strong adverse effects on food security.

Climate change may increase the burden of a range of climate-relevant health outcomes (medium confidence). Climate change is a multiplier of existing health vulnerabilities (high confidence), including insufficient access to safe water and improved sanitation, food insecurity, and limited access to health care and education. Climate change is projected to increase the burden of malnutrition (medium confidence), with the highest toll expected in children.

In all regions of the continent, national governments are initiating governance systems for adaptation and responding to climate change, but evolving institutional frameworks cannot yet effectively coordinate the range of adaptation initiatives being implemented (high confidence). Progress on national and subnational policies and strategies has initiated the mainstreaming of adaptation into sectoral planning. However, incomplete, under-resourced, and fragmented institutional frameworks and overall low levels of adaptive capacity, especially competency at local Government

levels, to manage complex socio-ecological change translate into a largely ad hoc and project-level approach, which is often donor driven. Overall adaptive capacity is considered to be low. Disaster risk reduction, social protection, technological and infrastructural adaptation, ecosystem-based approaches, and livelihood diversification are reducing vulnerability, but largely in isolated initiatives. Most adaptations remain autonomous and reactive to short-term motivations.

Growing understanding of the multiple interlinked constraints on increasing adaptive capacity is beginning to indicate potential limits to adaptation in Africa (medium confidence). Climate change combined with other external changes (environmental, social, political, technological) may overwhelm the ability of people to cope and adapt, especially if the root causes of poverty and vulnerability are not addressed.

There is increased evidence of the significant financial resources, technological support, and investment in institutional and capacity development needed to address climate risk, build adaptive capacity, and implement robust adaptation strategies (high confidence). Funding and technology transfer and support is needed to both address Africa's current adaptation deficit and to protect rural and urban livelihoods, societies, and economies from climate change impacts at different local scales. Strengthening institutional capacities and governance mechanisms to enhance the ability of national governments and scientific institutions in Africa to absorb and effectively manage large amounts of funds allocated for adaptation will help to ensure the effectiveness of adaptation initiatives (medium confidence).

Climate change and climate variability have the potential to exacerbate or multiply existing threats to human security including food, health, and economic insecurity, all being of particular concern for Africa (medium confidence). Many of these threats are known drivers of conflict (high confidence). Causality between climate change and violent conflict is difficult to establish owing to the presence of these and other interconnected causes, including country-specific socio-political, economic, and cultural factors. For example, the degradation of natural resources as a result of both overexploitation and climate change will contribute to increased conflicts over the distribution of these resources. Many of the interacting social, demographic, and economic drivers of observed urbanization and migration in Africa are sensitive to climate change impacts.

3.2 Impacts of climate change in Africa

AR5 presents strong evidence that the impacts²⁸ of climate change in Africa are already being felt across various sectors. Climate change poses challenges to economic

28 Impacts of climate change are the “effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives,

growth and sustainable development and to the various facets of human security. Although detection of and attribution to climate change are often difficult given the role of drivers other than climate change, there are substantially more impacts in recent decades now attributed to climate change.²⁹ Various examples show, however, that climate change exerts extensive pressure on different ecosystems such as terrestrial, freshwater, and coastal/ocean ecosystems.³⁰ The health, livelihoods and food security of people in Africa are all affected by climate change. And as “Africa as a whole is one of the most vulnerable continents due to its high exposure and low adaptive capacity”,³¹ innovation and technology, smart policy making, high levels of Government attention, effective diplomacy, and international cooperation are required in order to effectively address the current and future challenges related to climate change.

3.3 Future risks

The AR5 states that³²

climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.

Risk is “the potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values.”³³ Risk results from the interaction of vulnerability, exposure, and hazard. Risks from a changing climate in general come from a lack of preparedness making people vulnerable and the exposure of people or assets to harm, overlapping with triggering climate events (hazards). Key risks are potentially severe impacts of climate change and are considered key due to the high intensity of hazard or the high vulnerability of societies and systems exposed, or both. One major finding of AR5 is that the higher the increase in warming is, the higher is the risk.³⁴

livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts, and sea level rise, are a subset of impacts called physical impacts.” IPCC (2014:5).

29 IPCC (2014:7).

30 See Niang & Ruppel (2014:1214).

31 Niang & Ruppel (2014:1205).

32 IPCC (2014:13).

33 (ibid.:5).

34 Niang & Ruppel (2014:1238).

Particular challenges for less developed countries and vulnerable communities, given their limited ability to cope are the key risks as identified in AR5 as risks with high confidence, spanning sectors and regions, including but not limited to the following:³⁵

- risk of death, injury, ill-health, or disrupted livelihoods in low-lying coastal zones and small island developing states and other small islands, due to storm surges, coastal flooding, and sea-level rise;
- risk of severe ill-health and disrupted livelihoods for large urban populations due to inland flooding in some regions;
- systemic risks due to extreme weather events leading to breakdown of infrastructure networks and critical services such as electricity, water supply, and health and emergency services;
- risk of mortality and morbidity during periods of extreme heat, particularly for vulnerable urban populations and those working outdoors in urban or rural areas;
- risk of food insecurity and the breakdown of food systems linked to warming, drought, flooding, and precipitation variability and extremes, particularly for poorer populations in urban and rural settings;
- risk of loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions;
- risk of loss of marine and coastal ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for coastal livelihoods, especially for fishing communities in the tropics and the Arctic; and
- risk of loss of terrestrial and inland water ecosystems, biodiversity, and the ecosystem goods, functions, and services they provide for livelihoods.

For Africa in particular, the following key risks have been highlighted:³⁶

- risks of stress on water resources;
- sea level rise and extreme weather events;
- shifts in biome distribution;
- degradation of coral reefs;
- reduced crop productivity;
- adverse effects on livestock;
- vector- and water-borne diseases;
- under nutrition; and
- migration.

35 IPCC (2014:13).

36 See Niang & Ruppel (2014:1237).

4 Opportunities for effective action to reduce the risks associated to climate change

The risks associated with climate change need to be reduced by limiting the rate and magnitude of climate change. AR5 reveals that risks are reduced substantially under the assessed scenario with the lowest temperature projections. Furthermore, reducing climate change can also reduce the scale of adaptation that might be required.

In order to manage the risks of climate change, various approaches for adaptation come into consideration. Risk reduction strategies used in African countries to offset the impacts of natural hazards on individual households, communities, and the wider economy include early warning systems, emerging risk transfer schemes, social safety nets, disaster risk contingency funds and budgeting, livelihood diversification, and migration. Various adaptation approaches can be overlapping and are often pursued simultaneously. Most national governments in Africa are initiating governance systems for adaptation. Efforts to reduce vulnerability include disaster risk management, adjustments in technologies and infrastructure, ecosystem-based approaches, basic public health measures, or livelihood diversification.

Building more resilient societies is another means to cope with the challenges associated with climate change. Climate change, along with land-use change, degradation of ecosystems, poverty and inequality is one of the stressors that impinge on resilience. Climate resilient pathways have to be identified by decision-makers that lead to a more resilient world, *inter alia* through adaptive learning, increasing scientific knowledge, effective adaptation and mitigation measures, and other choices that reduce risks.

5 International legal mechanisms to address climate change

The intersections of international climate change law and multiple overlapping regulatory bodies reflect the fragmentation of global climate change governance in the absence of a universal climate change regime. This makes international climate change law extremely complex and global climate governance not very orchestrated. This overlapping complexity in the different climate change (related) regimes can be observed in various United Nations conventions, the international human rights regime, the world trade order under the World Trade Organization (WTO), multilateral environmental agreements (MEAs) and other international legal instruments that (directly or indirectly) deal with climate change, such as the Vienna Convention on

Ozone Depletion, the Montreal Protocol,³⁷ the Convention on Biodiversity, the London Dumping Convention, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the RAMSAR Convention on Wetlands of International Importance and the Convention on the Conservation of Migratory Species of Wild Animals, among others.

The international legal climate change regime is a product of international law, which has developed rapidly over the past few decades, especially since the dawn of the United Nations (UN), when rules and norms regulating activities carried on outside the legal boundaries of nations were developed. Numerous international agreements – bilateral, regional or multilateral – have been concluded and international customary rules, as evidence of a general practice accepted as law, have been established. For the purpose of this article, the following sections shall, however, only reflect on the most pertinent climate regimes, namely those around the UNFCCC.

6 The UN Framework Convention on Climate Change and its protocols³⁸

The UNFCCC and the Kyoto Protocol are treaties in terms of international law and Article 2.1(a) of the Vienna Convention on the Law of Treaties. International oversight and implementation of the climate regimes are only possible through an array of institutions under the UNFCCC and Kyoto regimes.³⁹ The COP is the supreme body of the UNFCCC, which regularly reviews the implementation of the Convention and any related legal instruments that the COP may adopt to promote the effective implementation of the Convention.

37 The 1987 Montreal Protocol introduced a series of effective steps to phase out the global production and consumption of ozone-depleting substances in the 1980s. The Protocol and successor agreements are not only regarded as highly successful examples of international environmental regulatory cooperation, there are also lessons to be learned from the ozone layer experience in dealing with climate change. The Montreal Protocol has made a substantial commitment to climate goals, and there are substantial proposals on the way to increase this. Having phased out 97% of almost 100 ozone-depleting substances (ODSs) it placed the ozone layer on a path to recovery. “Because many ODSs are also potent greenhouse gases (GHGs), their phase-out under the Montreal Protocol has provided an often overlooked bonus for climate mitigation: by the end of the decade, the Montreal Protocol will have done more to mitigate climate change than the initial Kyoto Protocol reduction target, reducing emissions in terms of carbon dioxide (CO₂), equivalent to 135 billion tonnes between 1990 and 2010 and delayed climate impacts – including abrupt and irreversible impacts – by about 12 years”. See <http://www.igsd.org/initiatives/montrealprotocol/> (also for further references), accessed 10 February 2018.

38 This section is largely based on Ruppel (2013).

39 Depledge & Yamin (2009).

The mandate of the COP to amend the UNFCCC and the Kyoto Protocol, or adopt a new legal instrument that either supplements or replaces the Kyoto Protocol, is broadly limited by the UNFCCC's objective and guiding principles. The UNFCCC, however, only provides a general framework to combat climate change. Parties have a responsibility to protect the climate system in accordance with their common but differentiated responsibilities and respective capabilities.⁴⁰

The Convention is a framework document, identifying two major areas of action required to address climate change, namely mitigation and adaptation. Moreover, the Convention as a legal instrument identifies a wide range of measures (see, e.g., the diversity of measures in Article 4.1) to address climate change through other activities such as scientific and technical cooperation, technology transfer, finance etc. The UNFCCC allows any state to become a party, and as at 2018 has 197 parties, making it a global instrument. Within this framework of global participation, actual obligations of parties differ substantially between industrialised and developing countries. The UNFCCC enshrines a number of key principles (Article 3) including the principles of *equity* and *common but differentiated responsibilities and respective capabilities*. Today's accumulated greenhouse gas emissions originate mainly from over 150 years of carbon-based industrial activity in developed states. Therefore, the UNFCCC recognises that all countries have a common responsibility to tackle climate change, but places a heavier burden on industrialised states to fulfil their historic responsibility of addressing climate change.⁴¹

These principles are reflected in the obligations established for developed and developing countries in the Convention, including those relating to mitigation, adaptation, technology transfer, finance as well as communication of information relating to the Convention. The Convention goes further to make provision for countries in special situations, including particularly vulnerable countries, least-developed countries and countries undergoing transition to a market economy. Article 4 (4) UNFCCC, for instance, states:

The developed country parties ... shall assist the developing country parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.

The UNFCCC allows for the introduction of protocols to the Convention. The first of these is the Kyoto Protocol. This agreement came into force on 16 February 2005. A number of global initiatives are being implemented to assist in the operationalisation of the UNFCCC. For example, the Global Environment Facility (GEF) serves as an operating entity of the UNFCCC financial mechanism and has been supporting the

40 For more details, see AMCEN (2011).

41 Boisson de Chazourne (2008).

national capacity self-assessment process at national level for some time. This is aimed at providing countries with an opportunity to articulate their own capacity needs in implementing the UNFCCC, the other two Rio Conventions and other non-Rio Conventions (e.g. chemicals). The ultimate objective of the UNFCCC is to stabilise greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate.⁴² Such a level – and this is generally regarded by developing countries as an integral part of the aforementioned objective – should be reached within a timeframe, which allows ecosystems to adapt naturally to climate change while guaranteeing that food production is not at risk and that development occurs in a sustainable manner.

The Kyoto Protocol shares the objectives and the institutions of the UNFCCC. The major distinction between the two is that while the UNFCCC only encourages industrialised countries to stabilise greenhouse gas emissions, the Kyoto Protocol obliges them to do so. Just like the UNFCCC, the Kyoto Protocol imposes a heavier burden on developed nations under the principle of common but differentiated responsibilities. This group of countries must first and foremost take domestic action to address climate change, but the Kyoto Protocol allows them a certain degree of flexibility in satisfying their emissions commitments.

Under the Kyoto Protocol, actual emissions have to be monitored – each party must keep a national register to show measures carried out under the Kyoto Protocol instruments. The secretariat keeps an independent transaction log to verify that operations are consistent with the rules of the Kyoto Protocol. The most important aspect of the Kyoto Protocol is arguably the creation of an aggregate target for the developed countries (Article 3) as well as legally binding and quantified individual targets set out in Annex B. It should also be noted that there are significant commitments for reporting, review, independent assessment and compliance (Articles 5, 7, 8 and 18).⁴³

Under the adaptation objective, the Kyoto Protocol, like the UNFCCC, is designed to support countries in adapting to the inevitable effects of climate change and to facilitate the development of techniques that can help increase resilience to climate change impacts. An Adaptation Fund was set up to help with concrete adaptation projects in developing countries. The Adaptation Fund is a solidarity fund in which a proportion of the revenue of CDM projects in developing countries is contributed to a fund to assist adaptation projects in other developing countries.

42 See Article 2 of the UNFCCC.

43 For further information see <https://unfccc.int/process/the-kyoto-protocol>, accessed 10 February 2018.

In the course of the United Nations Climate Change Conference held in Cancun, Mexico in 2010, a set of agreements were reached, building on the Bali Road Map⁴⁴ and the Copenhagen Accord,⁴⁵ which clearly reflect that the parties to the UNFCCC and the Kyoto Protocol had taken up the issue of climate justice. Three decisions have resulted from the Cancun Conference: one decision by the COP to the UNFCCC⁴⁶ and two decisions by the COP serving as the meeting of the Parties to the Kyoto Protocol.⁴⁷ The reduction of greenhouse gas emissions and the support for developing nations to deal with climate change are at the core of the Cancun agreements. In order to advance action regarding the aim of the reduction of greenhouse gas emissions in a mutually accountable way, national plans are formally captured at international level under the banner of the United Nations Framework Convention on Climate Change. Support for developing nations is provided for in the Cancun agreements and includes financial, technology and capacity-building support, which is to be realised through various mechanisms: nationally appropriate mitigation actions (NAMA); reducing emissions from deforestation and forest degradation (REDD+); the Clean Development Mechanism (CDM); the Cancun Adaptation Framework (CAF); the technology mechanism; and the Green Climate Fund (GCF).

At the COP18 to the UNFCCC and the MOP8 to the Kyoto Protocol held in Doha, Qatar in 2012, a second commitment period under the Kyoto Protocol has been launched, with 2020 as the end date. Unfortunately, several countries that had previously participated in the Kyoto Protocol have not joined the second commitment period, such as Russia, Canada, New Zealand and Japan.

The major outcome of COP21 in Paris in 2015 was the Paris Agreement. After the Kyoto Protocol, the Paris Agreement is considered to be a landmark agreement as it paves the way into a sustainable low carbon future. The Paris Agreement entered into force on 4 November 2016 and contains the following cornerstones: As a long-term goal it is envisaged to keep global warming well below two degrees and to pursue efforts to limit the temperature increase even further to 1.5 degrees. The Paris Agreement provides for a system of Nationally Determined Contributions (NDCs). These

44 The Bali Road Map emerged from the 2007 Bali Climate Change Conference and includes the Bali Action Plan (Decision 1/CP.13), which launched a “comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action” along with a number of other decisions and resolutions.

45 Agreed upon by the UNFCCC Conference of the Parties, in Copenhagen on 18 December 2009 by way of Decision 2/CP.15.

46 Decision 1/CP.16 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention.

47 Decision 1/CMP.6 The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its fifteenth session; and Decision 2/CMP.6 The Cancun Agreements: Land use, land-use change and forestry.

are voluntary commitments by states to climate change mitigation and adaptation, which are defined in a self-determined national process and are subject to review every five years. Financial commitments from developed countries, especially to the least developed countries, which suffer most from climate change have been laid down just as provisions on loss and damage from climate change, whereas state liability or any form of interstate damages have explicitly been excluded in the agreement.

7 Africa in the international climate negotiations

African countries are particularly vulnerable to and suffer most from the impacts of climate change, while their GHG emissions are the lowest in the world. Thus, Africa's voice in the international climate negotiations should be louder. However, it seems that the driving seats in international climate negotiations are predominantly occupied by those countries which have contributed most to global warming. For Africa one way out of this dilemma is to consolidate positions and to speak with a strong common and unified African voice at international climate negotiations. Several approaches and initiatives have been going in this direction, such as the African Group of Negotiators (AGN), an alliance of African states supported to ensure effective participation in the climate change negotiations by providing technical and legal assistance as well as administrative support. However, the process remains challenging due to the heterogeneity of African countries, interests and expectations.

References

- Adger, WN, JM Pulhin, 2014, Human security, in CB Field, VR Barros, DJ Dokken, KJ Mach, MD Mastrandrea, TE Bilir, M Chatterjee, KL Ebi, YO Estrada, RC Genova, B Girma, ES Kissel, AN Levy, S MacCracken, PR Mastrandrea, LL White (eds), *Climate change 2014: impacts, adaptation, and vulnerability. Contribution of working group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge, Cambridge University Press, 755-791.
- AfDB / African Development Bank, 2017, *Indicators on gender, poverty, the environment and progress toward the sustainable development goals in African countries*, Abidjan, African Development Bank, https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/GENDER_Poverty_and_Environmental_Indicators_on_African_Countries-2017.pdf, accessed 10 February 2018.
- AMCEN / African Ministerial Conference on the Environment, 2011, *Addressing climate change challenges in Africa – A practical guide towards sustainable development*, <https://www.reep.org/guide-book-addressing-climate-change-challenges-africa>, accessed 10 February 2018.
- Barbier, EB, 2010, *A global green new deal. Rethinking the economic recovery*, Cambridge, Cambridge University Press.

- Boisson de Chazourne, L, 2008, The United Nations Framework Convention on Climate Change, <http://legal.un.org/avl/ha/ccc/ccc.html>, accessed 10 February 2018.
- Crutzen, PJ & EF Stoermer, 2000, The Anthropocene, 41 *Global Change Newsletter*, 12-13.
- Depledge, J / F Yamin, 2009, The global climate regime: a defence, in Helm, D & C Hepburn (eds), *the economics and politics of climate change*, Oxford, Oxford University Press, 433-453.
- Erens, S, J Verschuuren & K Bastmeijer, 2009, Adaptation to climate change to save biodiversity: lessons learned from African and European experiences, in Richardson, BJ, Y le Bouthillier, H McLeod-Kilmurray, S Wood (eds), *Climate law and developing countries. Legal and policy challenges for the world economic order*, Cheltenham, Edward Elgar, 207-231.
- Hinz, MO & OC Ruppel (eds), 2008, *Biodiversity and the ancestors: challenges to customary and environmental law. Case studies from Namibia*, Windhoek, Namibia Scientific Society.
- Hinz, MO & OC Ruppel (eds), 2010, Biodiversity conservation under Namibian environmental law, in Schmiedel, U, N Jürgens & T Hoffman (eds), *Biodiversity in southern Africa – Volume 2: patterns and processes at regional scale*, Göttingen & Windhoek, Klaus Hess Publishers, 190-194.
- IPCC / Intergovernmental Panel on Climate Change, 2014, *Climate change 2014: synthesis report – contribution of working groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, RK Pachauri & LA Meyer (eds), Geneva, IPCC, http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf, accessed 10 February 2018.
- Leary, N, J Adejuwon, W Bailey, V Barros, M Caffera, S Chinvanho, C Conde, A de Comarmond, A de Sherbinin, T Downing, H Eakin, A Nyong, M Opondo, B Osman, R Payet, F Pulhin, J Pulhin, J Ratnasiri, E Sanjak, G von Maltitz, M Wehbe, Y Yin, G Ziervogel, 2006, *For whom the bell tolls: vulnerabilities in a changing climate*, AIACC / Assessments of Impacts and Adaptations to Climate Change Working Papers, Washington, DC, AIACC.
- Mfune, JK, OC Ruppel, NE Willemse, AW Mosimane, 2009, *Proposed climate change strategy and action plan*, Windhoek, Versacon Earthwise Consulting and Ministry of Environment and Tourism.
- Niang, I & OC Ruppel, et al. 2014, Africa, in: CB Field, VR Barros, DJ Dokken, KJ Mach, MD Mastrandrea, TE Bilir, M Chatterjee, KL Ebi, YO Estrada, RC Genova, B Girma, ES Kissel, AN Levy, S MacCracken, PR Mastrandrea & LL White (eds), *Climate change 2014: impacts, adaptation, and vulnerability*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge, Cambridge University Press, 1199-1265.
- Palosuo, E (ed.), 2009, *Rethinking development in a carbon-constrained world. development cooperation and climate change*, Helsinki, Ministry of Foreign Affairs of Finland.
- Ruppel, OC, 2008a, Third-generation human rights and the protection of the environment in Namibia, in Horn, N & A Bösl (eds), *Human rights and the rule of law in Namibia*, Windhoek, Macmillan Education, 101-120, http://www.kas.de/proj/home/pub/8/2/-/dokument_id-16045/index.html, accessed 20 August 2017.
- Ruppel, OC, (ed.), 2008b, *Women and custom Namibia: Cultural practice versus gender equality?*, Windhoek, Macmillan Education, http://www.kas.de/proj/home/pub/8/2/dokument_id-15086/index.html, accessed 20 September 2017.
- Ruppel, OC, 2010a, Der Klimawandel trifft Frauen und Kinder besonders hart, *Allgemeine Zeitung*, 30 August 2010.
- Ruppel, OC 2010b, Women's rights and customary law in Namibia: A conflict between human and cultural rights?, *Basler Afrika Bibliographien BAB Working Paper 2010/2*, http://www.baslerafrika.ch/upload/files/WP_2010_2_Ruppel.pdf, accessed 20 January 2018.

- Ruppel, OC, 2010c, The Namibian ascertainment of customary law project and the Human Rights and Documentation Centre, in Hinz, MO (ed.), 2010, *Customary law ascertained. Volume I. The customary law of the Owambo, Kavango and Caprivi communities in northern Namibia*, Windhoek, Namibia Scientific Society.
- Ruppel, OC, 2016, Setting the scene: Human vulnerability and findings of the Intergovernmental Panel on Climate Change, in: Ruppel, OC & K Ruppel-Schlichting, *Environmental law and policy in Namibia – towards making Africa the tree of life*, Windhoek, Hanns-Seidel-Foundation, 281-290.
- Scholtz, W, 2010, The promotion of regional environmental security and Africa's common position on climate change, 10 *African Human Rights Law Journal*, 1-25.
- UNDESA / United Nations Department of Economic and Social Affairs, 2017, *World population prospects: the 2017 revision*, https://esa.un.org/unpd/wpp/Publications/Files/WPP2017_KeyFindings.pdf, accessed 10 February 2018.