Climate Change Adaptation and Disaster Risk Reduction Regimes: International Legal Frameworks and Institutional Linkage.

Getanda kelvin Ondieki

Student number 277204

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Supervisor: Harro Van Asselt

University of Eastern Finland, Law school

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ABSTRACT

UNIVERSITY OF EASTERN FINLAND

Faculty	Unit
Faculty of Social Sciences and Business Studies	**Law School**

Author

Getanda Kelvin Ondieki

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Abstract

According to Intergovernmental Panel on Climate Change reports 2007-2015, there is a close relationship between effects of climate change and the number of natural disasters. In addressing these challenges, there is need to link climate change adaptation and disaster risk reduction since they both have common practical similarities and with common objectives. However, the two have been developed in isolation, rather than as a part of a parallel and intertwined process. Facilitating climate change adaptation and disaster risk reduction to operate closely would require better linkage in their respective international regime frameworks and institutions.

Therefore, this research was carried out to assess the international legal frameworks and institutional linkages between climate change adaptation and disaster risk reduction regimes. It sought to achieve this by two questions: What are the international legal frameworks for climate change adaptation and disaster risk reduction regimes? And, to what extent are the international regimes for climate change adaptation and disaster risk reduction linked? In the analysis, Doctrinal research method was used to assess the legal linkage in the regime frameworks while literature review was used to examine the practical and institutional linkage. The result of the analysis was presented in terms of discussion, tables, and diagrams.

The finding of this study reveals that climate change adaptation regime is separately based on a legally binding framework of the Paris Agreement Framework Aticle7 under the UNFCCC Treaty, while a disaster risk reduction is based on the Sendai Framework of Action while is not legally binding to member parties. There is no clear legal framework which links the two regimes. The research therefore recommends a need to establish a linkage framework between climate change adaptation and disaster risk reduction regimes, and link the respective regime institutions.

Key words

Climate change adaptation, Disaster risk reduction, Institutional linkages, International legal frameworks

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United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, adopted 17th June 1994, entered into force 26th Dec 1996. 1954 UNTS 3; 33 ILM 1328 (1994).

Framework Convention on Civil Défense Assistance, 272 UNTS 213, May 22, 2000, in force Sept. 23. 2001.

Convention on Biological Diversity, (Rio de Jeneiro, June 5, 1992, 31 ILM 88, entered into force Dec 1993) 1760 UNTS 79.

ABBREVIATIONS

CBD-	Convention on Biological Diversity
CCA-	Climate Change Adaptation
COP-	Conference of the Parties
DRR-	Disaster Risk Reduction
IPCC	Intergovernmental Panel on Climate Change
SDG-	Sustainable Development Goals
SFDRR-	The Sendai Framework for Disaster Risk Reduction
UNFCCC-	United Nations Framework Convention on Climate Change
UNISDR-	United Nations Office for Disaster Risk Reduction

1. INTRODUCTION TO THE STUDY

1.1 Background

According to the Intergovernmental Panel on Climate Change (IPCC) Working Group (II) summary report 2014, climate change effects are amplifying disasters in terms of both magnitude and intensity leading to more disasters such as drought and famine, floods, food insecurity, diseases, political instability, and armed conflicts.[1] The summary report for policymakers explicitly gives the relationship between climate change impacts and disasters, recommends on how impacts and risks related to climate change can be reduced and managed through adaptation and mitigation.[2] This was also echoed in the 2012 IPCC Working Groups I and II report, which underscored the importance of linking disaster risk reduction and climate change adaptation.[3] However, in reality, practical approaches in climate change adaptation and disaster risk reduction have primarily been developed in isolation, rather than as a part of a parallel and intertwined process.[4]

In addition, international climate change adaptation and disaster risk reduction regimes have developed separate and distinct institutions dealing with climate change adaptation and disaster risk reduction respectively. This is likely to be a challenge in establishing further separate institutions at the national and local level, to deal with both climate change adaptation, loss, and damage, and disaster risk reduction.[5] Enabling climate change adaptation and disaster risk reduction to operate more closely requires better linkages in their respective international regimes frameworks and institutions.[6] However, despite the common overlapping goals, climate change adaptation regime is embedded separately under the international treaty of

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[1] *IPCC,* Climate Change 2014–Impacts, Adaptation and Vulnerability: Regional Aspects, p. 2-6.

[2] Ibid, p. 11-16.

[3] *IPCC,* Managing the risks of extreme events and disasters to advance climate change adaptation a special report of Working Groups I and II, 2012, p. 393-480.

[4] *Birkmann, -Pardoe* 2014, p. 41.

[5] *Shamsuddoha et al*... 2013, p. 6.

[6] *Schipper et al*... 2016, p. 216-228.

United Nations Framework Convention on Climate Change (UNFCCC),[7] while as disaster risk reduction regime is majorly guided by the United Nation Sendai Framework for Disaster Risk Reduction.[8]

The need to link climate change adaptation and disaster risk reduction regimes is becoming increasingly recommended by the policy researchers, scientific community, international agencies, and even in the respective international and national climate change and disaster risk reduction regimes.[9] However, there is less literature found in the international frameworks and institutional linkage for climate change adaptation and disaster risk reduction. Many researchers have been carrying out studies on the practical and scientific relationship between climate change adaptation and disaster risk reduction with less focus on their international frameworks and institutional linkages.[10]

Nevertheless, this research seeks to examine international legal frameworks and institutions linkage between climate change adaptation and disaster risk reduction regimes. It could oblige treaty bodies and future treaty negotiators in climate change adaptation and disaster risk reduction frameworks with overlapping subject matters of resilience and risk management, or in instances where treaties have the potential to conflict, to cooperate directly so that their effectiveness can be maintained and even increased.[11]

An international linkage framework for climate change adaptation and disaster risk reduction would improve the effectiveness of international environmental laws, especially in addressing the challenge of legal and institutional fragmentation.[12] The leading contemporary strategy for inducing a more effective international environmental regime is to identify and create what are

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[7] *UN General Assembly, United Nations Framework Convention on Climate Change*: resolution / adopted by the General Assembly, 20 January 1994, entered into force 21st March 1994. A/RES/48/189.

[8] *Peters et al*... 2016, p.16.

[9] *Djalante- Thomalla* 2012, p.16.

[10] *Gero et al*... 2011, p. 312.

[11] *Chambers2008,* p,247.

[12] *Munene, et al...* International Journal of Disaster Risk Reduction, 2018, p. 3-7.

called linkages or interlinkages.[13] The legal framework to which an international linkage has been established is what would be referred to as an international linkage framework. This international linkage framework would be of a 'soft' legal nature in that it is voluntary or hard -laws thus binding in accordance with international legal principles.[14] This creates an opportunity with a legal basis to link environmental regimes with common goals and objectives, and for this research between climate change adaptation and disaster risk reduction.

Climate change adaptation wasn't given a significant attention and space within the UNFCCC compared to mitigation, until recently where now adaptation has been included in the framework as an article in a legal text.[15] It was rather treated as a little brother to climate change mitigation at the international platform. [16] Nevertheless, in the past decade, climate change adaptation has been addressed as one of the key pillars of climate change regime in response to climate change impacts.[17] This significant progress is evidently leading to the inclusion of adaptation in Article 7 of the Paris Agreement 2015.[18] Although this is would be a significant progress for climate change adaptation regime, disaster risk reduction was not legally included under this article. However, there are some common linking goals for climate change adaptation and disaster risk reduction in the Paris Agreement which are the aim of resilience, vulnerability and risk management.[19]

On the other hand, despite the many references of climate change hazards and influence climate change to disasters, the Sendai Framework for Disaster Risk Reduction still leaves a gap with no clear linkage with climate change adaptation regime.[20] Practically, even though climate change adaptation and disaster risk reduction are developed in isolation from each other, there is a significant potential for greater synergies between them if linked together since they share

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[13] *Chambers* 2008, p. 6.

[14] *Lyman 2015,* p. *6.*

[15] *Smith* Sandford Environmental Law Journal ,*2016*, p. 1.

[16] *Schipper* Tyndall Centre for Climate Change Research Working Paper, 2007, *p. 6.*

[17] *Hall-Persson* European Journal of International Relations,2017, p. 1.

[18] *UNFCCC Adoption of the Paris Agreement*, 2015, Article 7

[19] *Burleson* 2016, p. 4.

[20] *Kelman,* International Journal of Disaster Risk Science,2015, p. 124.

many common practices.[21] In addition, Linking climate change adaptation and disaster risk reduction through policy formulation and legislation can facilitate economic planning and project implementation at national level, [22] and facilitate achievement of Sustainable Development Goals (SDGs).[23] Other advantages according to UNDP report 2012 would include "minimizing duplication of effort and redundancies, reducing potential conflicts in policy development, and making efficient use of scarce financial, and human resources."[24] Thus there is a need for an international linkage framework between climate change adaptation disaster risk reduction to facilitate regime linkage. This would lead to further national legislation and policy adoption in linking climate change adaption and disaster risk reduction practices.

It is against this backdrop that this research seeks to examine the international legal frameworks and institutional linkage between climate change adaptation and disaster risk reduction. In focus of the research, here are the research questions and the objectives.

1.2 Research questions and objectives

The main research objective is to assess the international legal and institutional linkage between climate change adaptation and disaster risk reduction regimes.

To achieve this objective, the main research question is as follows:
To what extent are the international regimes for climate change adaptation and disaster risk reduction legally and institutionally linked?
Specifically,
1) How are climate change adaptation and disaster risk reduction related? And why should they be linked?

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[21] *Shamsuddoha et al...* 2013, p. 22.

[22] *Shaw-Pulhin-Pereira* 2010, p. I55.

[23] *Schipper*, Tyndall Centre for Climate Change Research Working Paper 2007, p. 107.

[24] *UNDP, IUCN*, November (2012), report on Framework for action and 3-year Action Plan: "Strengthening Synergies between Governance of Disaster Risk Reduction and Climate Change Adaptation in Jordan with a View to Reduce Poverty", p. 6.

2) What are the international legal frameworks for climate change adaptation and disaster risk reduction regimes?

3) To what extent are the international regimes for climate change adaptation and disaster risk reduction linked? What are the opportunities for their further linkage?

1.3 Research structure

The research has been presented in five chapters discussion. Each chapter leads to the next one as it attempts to answers the research questions. Chapter one introduces the background information with an introduction, leading to the research questions and research objectives. It also presents the research methods used in data collection and analysis. This leads to chapter 2 which presents the literature background on the practical relationship between climate change adaptation and disaster risk reduction. Chapter 2 is developed further into subsections where practical similarities, difference and converging areas between climate change adaptation and disaster risk reduction are discussed. This lead to chapter 3 which further assesses the international legal frameworks for climate change adaption and disaster risk reduction regimes. In addition, chapter three also examines the reasons why climate change adaptation and disaster risk reduction regimes should be linked. This leads to the next chapter which addresses on the link between the two regimes

Chapter 4 critically evaluates the international frameworks linkage between climate change adaptation and disaster risk reduction. Regimes, and how their respective institutions are linked or cooperate. Chapter 5 further presents an evaluation on the future prospective legal framework link between climate change adaptation and disaster risk reduction regimes, and their institutional cooperation/linkage. Chapter 5 also evaluates the challenges facing framework linkage between climate change adaptation and disaster risk reduction regimes, the discussion analysis summary and conclusion.

1.4 Research methodology

The study uses doctrinal research method to analyze the legal framework for climate change adaptation, and literature review to analyze the institutional linkage between climate change adaptation and disaster risk reduction. Doctrinal research method was applied in analyzing the legal frameworks and legal agreements using primary sources of data which were obtained from legal articles namely agreements, treaties, and other international.

Literature review and documentary analysis research method were used to explore the practical and institutional linkage between climate change adaptation and disaster risk reduction. Data were obtained from secondary sources including academic articles, books, and reports, grey materials, official UN agencies' websites, internet and the University library. Secondary data is essential for better and critical analysis, as they contain views and critique from other researchers.

2 THE PRACTICAL RELATIONSHIP BETWEEN CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION.

This chapter critically reviews the practical relationship between climate change adaptation and disaster risk reduction. It presents the definition of terminologies (climate change adaptation, disaster risk reduction) as used in the research, practical linkage (similarities and differences) between climate change adaptation and disaster risk reduction.

2.1 General background

The following section presents definition of terminologies as used in the research.in this research.

2.1.1 What is climate change adaptation?

Climate change adaptation has been defined differently by various stakeholders in the field, According to UN-IPCC it is defined as "the adjustment in natural or human systems in response to actual or expected climate stimuli or effects, which moderates harm or exploits beneficial opportunities."[25] IPCC continues further to distinguish climate change according to intention and time of action, the type of climate change adaptation and type of actors involved, such as autonomous versus planned adaptation, anticipatory versus reactive adaptation, and public versus private adaptation.[26] IPCC provides a broad definition as compared to other definitions. While on the other hand, United Nations Development Programme defines climate change adaptation as "a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented."[27] Other regional organisations and countries have paraphrased the same definition in various forms. All the definitions have a common focus of addressing the negative effects of climate change.

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[25] *IPCC* Summary report for Policymakers: Climate change fourth assessment report on Impacts, Adaptation and Vulnerability. Contribution of Working Group II, 2007. p.65.

[26] *Srinivasan 2006, p.*77.

[27] *UNDP*,2006.

2.1.2 What is disaster risk reduction?

Disaster risk reduction is defined by UNISDR as "the concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and environment, and improved preparedness for adverse events."[28] Disaster risk reduction exists in the realm of disaster risk management. A disaster is defined by UNISDR "a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts."[29] Examples of these disasters include floods, drought and famine, earthquakes, genocides, wars, and technological accidents.

UNISDR defines disaster risk management 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."[30] It may involve different approaches which include "prospective disaster risk management activities address and seek to avoid the development of new or increased disaster risks."[31] They focus on addressing disaster risks that may develop in future if disaster risk reduction policies are not put in place. Examples of disaster risk management activities are better land-use planning or disaster-resistant water supply systems. In addition, other measures would include corrective disaster risk management and compensatory disaster risk management are also referred to as residual risk management.[32]

Disaster risk management has always been carried out in the continuum of a disaster cycle.[33] A disaster cycle involves the sequences and components of managing a disaster which include

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[28] *UNISDR* Definition of terminologies 2007.

[29] *Ibid.*

[30] *Ibid.*

[31] Ibid.

[32] *Ibid.*

[33] *Lavell et el*… 2012, p.35.

disaster preparedness, emergency response, rehabilitation, and reconstruction.[34] However, the disaster cycle continuum notion was criticised "for its mechanistic depiction of intervention process by scholars (Lavell and Franco, 1996; Lewis, 1999; Wisner et al., 2004; Balmer, 2005; van Niekerk, 2007)."[35] The concept of disaster risk reduction was later adopted due to the risk management process involved at all the stages of the cycle.

Disaster risk reduction aims at preventing new and reduce existing disaster risks, and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.[36] This aim is important not only in meeting the framework objectives but also towards achieving sustainable development goals.

2.2 The practical linkage between climate change adaptation and disaster risk reduction.

Practically CCA and DRR are being practiced with more of similarities as compared to their differences. However, it should be noted that CCA and DRR have both similarities and differences too.[37] While recognizing both the similarities and differences between them, there is an increasing literature which supports mainstreaming them together (Mitchell and van Aalst, 2008; Venton and La-Trobe, 2008; Schipper, 2009; Mercer, 2010; Mitchell et al., 2010)[38]. The need to link DRR and CCA is to achieve a coordinated action of solving environmental challenges, and it has also been stressed by both UNISDR (2013)[39] and IPCC-SREX (2012)[40] report.[41]

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[34] *Ibid*, p.35.

[35] *Ibid.*

[36] *UNISDR* 2007 Definition of Terminologies.

[37] *Mitchell et al…* 2008, p.1-21.

[38] *Djalante-Thomalla* International Journal of Disaster Resilience in the Built Environment,2012, p.16.

[39] *The European Forum for Disaster Risk Reduction,* Working Group on Climate Change Adaptation and Disaster Risk Reduction 2013, p.7-9.

[40] *IPCC* Special report on managing the risks of extreme events and disasters to advance climate change adaptation 2012, p.582.

[41] *Rivera* 2014, p. *6.*

In addition, the scientific community has also brought to the limelight the point of convergence between climate change adaptation and disaster risk reduction based on their similarities. Below is a discussion on the similarities, differences, and point of convergence between climate change adaptation and disaster risk reduction in practice.

2.2.1 Similarities between climate change adaptation and disaster risk reduction

First, the aims of climate change adaptation and disaster risk reduction overlap each other since they both aim at reducing the effects of climate-related disasters and associated risks.[42] According to the IPCC fourth assessment report of the Working Group II "Impacts, Adaptation and Vulnerability " describes the likely effects of climate change which includes climate-related disasters.[43] Climate-related hazards such as droughts, floods, cyclones and forest fires would eventually result in disasters if not well managed.[44] In addition, weather-related disasters account for over two-thirds of all disaster events, and their significance is likely to increase with global warming.[45] This is likely to cause rising global temperature leading to an increase in droughts in mid-latitudes and semi-arid areas, increased water stress in many parts of the world, increased damage from storms, and coastal flooding, affecting millions of people each year.[46]It can be observed that there is a link between climate change impacts and the number of disasters around the world, more so in the developing countries.

Thus, there is a shared common goal towards managing both climate change impacts and disaster risks. Both CCA and DRR focuses on reducing vulnerability and enhancing the resilience of societies to weather and climate hazards.[47] Anderson (2006) based on an empirical evidence analysis in Europe, concludes that "there is high confidence that climate change has already had an impact on some disasters; in others, there is growing certainty, and in others,

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[42] *Ibid*, p. *3.*

[43] *IPCC* Synthesis report on the contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change 2014, p. 151.

[44] *UNFCCC* Technical paper, 2008, p.22-28.

[45] *Network* Policy Paper 2008, p.2.

[46]*Ibid.*

[47] *Hay* 2012, p.6.

the link is not yet clear." He further notes that there are few instances in which no influence whatsoever is expected to be found between disasters and climate change.[48]

Secondly, both climate change adaptation and disaster risk reduction share some common stakeholders since climate change and disasters affect multi-sectoral areas. In order to achieve effective reduction of vulnerabilities to natural hazards, climate change requires coordination across different levels and sectors of governance.[49] It requires participation at all levels of government, from local to national and international, as well as the involvement of civil society and the private sector.[50] Based on literature, these stakeholders who are also referred to as actors have been broadly grouped by Lemos and Agrawal (2006) into three main domains: national and subnational governments (state actors' domain), private sector (market actors' domain), and communities (social actors' domain).[51] Additionally, establishment multi-sectoral committees and other related initiatives can help to strengthen the link between disaster risk management and climate change adaptation at local levels national levels.[52] This is according to a study carried out in some countries, the study included an inter-ministerial commission for climate change in Mexico, a Thematic ad-hoc working group on climate change adaptation in Vietnam, and the inter-ministerial committee for climate change in Kenya .[53] The report further notes that while solutions for climate change and disasters will differ based on geographical and cultural setting, "it is important that institutional arrangements are put in place that enable networks addressing disaster and climate risks to work together for effective utilization of resources".[54]

Thirdly, both climate change adaptation and disaster risk reduction share some common measures, tools, and approaches to management at household and community level.[55] Some of the best adaptive measures initiated at a local level for disaster risk reduction are now being

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[48] *Anderson-Bausch* 2006, p. *26.*

[49] *AMS* 2006, p.7.

[50] *UNFCCC* Technical paper 2008, p.12.

[51] *Forino, et al...* International Journal of Disaster Risk Science *2015, p.*374.

[52] *AMS* 2006, p. 12

[53] *Ibid.*

[54] *AMS* 2006, p.17.

[55] *Rivera* 2014, p. *3.*

shared as a common practice to climate change adaptation. For instance, disaster risk reduction and climate change adaptation are highly relevant to programming in slow-onset disasters through early warning systems.[56] 'Slow onset' disaster is a term used to refer to "a disaster which does not result from a single, distinct hazard, but one that emerges gradually (over weeks to months and even years), based on a combination of complex and interrelated circumstances".[57] Examples of slow onset hazards include climate-related hazards such as droughts, floods, cyclones and environmental degradation conditions. The use of common approaches and tools would be effective in managing weather-related events or hazards exacerbated by climate change. These tools and approaches include use of risk assessment maps, developing early warning systems, community adaptive practices, land-use planning and building code regulation, institutional and legal capacities and use of local indigenous knowledge.[58]

Fourthly, both adaptation and disaster risk reduction seek to build resilience to hazards in the context of sustainable development.[59] There is indisputable evidence linking development with the state of the environment and disasters based on the literature available (Shaw and Tran 2012, Tran et al. 2009, Srinivas and Nakagawa 2007, Schipper and Pelling 2006) which shows achieving sustainable development would minimise the number of disasters and the impact of climate change.[60] Climate change adaptation needs re-shaping and re-designing of development, social and economic practices to respond effectively to new or anticipated environmental changes. The Same way that disaster risk reduction aims to influence development decision-making process and protect development aspirations from environmental related risks.[61] Furthermore, in achieving the sustainable development goals under vision 2030 target, both climate change adaptation and disaster risk reduction practices are essential. Both climate change impacts and disaster impacts affect the community development negatively. While responding to the challenges through disaster risk reduction

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[56] *Manzoor* 2013, p. 113.

[57]*Ibid*, p. 111.

[58] *Venton-Trobe* 2008, p.11-14.

[59]*Ibid*, p.5.

[60]*Shaw et al*…2016, p. 1.

[61] *Venton-Trobe* 2008, p. 4.

measures and climate change adaption measures affect development positively since they lower vulnerability and poverty levels.[62]

Furthermore, other similarities between climate change adaptation and disaster risk reduction in practise can be highlighted by case by case analysis. For instance, based on the table analysis presented by Tearfund group, due to the common features of risks between climate change impacts and disaster impacts, specialists are now sharing professional skills.[63] Also, both climate change adaptation and disaster risk reduction are concerned with both current and future possible risks through early warning mechanisms. Both climate change adaptation and disaster risk reduction need funding and other material support to the community to achieve the desired measures.[64]

2.2.2 Differences between climate change adaptation and disaster risk reduction.

Although there is no clear-cut line between CCA and DRR due to many similarities, there are some clear differences between the two regimes. As illustrated in *Table 1*, DRR encompasses all disaster risks and it is holistic in nature in that it deals with all steps towards minimizing all risks. While in contrast, CCA is more concerned with climate change, induced risks/environmental risks and is selective in nature since it only deals with climate-related hazards and risks.[65] Therefore, DRR goes beyond the remit of climate change adaptation.[66]

Secondly, CCA considers the long-term adjustment to changes in gradual changing climatic condition, this includes the accompanied opportunities, whereas DRR predominantly focuses on extremes which would lead to disasters.[67] Also, climate change adaptation moves outside the realm of DRR field in addressing longer-term impacts of climate change such as loss of biodiversity, changes in ecosystem services and spread of climate-sensitive disease. However,

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[62] *UNISDR* Disaster risk reduction and resilience in the 2030 agenda for sustainable development 2015, p. 1-10.

[63] *Mitchell-Van* 2008, p.3-4.

[64]*Ibid.*

[65] *Ibid*, p. 9.

[66] *Venton-Trobe* 2008, p. 7.

[67] *International Federation of Red Cross and Red Crescent Societies*: Mainstreaming DRR and CCA- a guide to mainstreaming guiding principles disaster risk reduction and climate change adaptation 2013, p. 4.

this is not the case for DRR which prioritises on current and near-future hazard risk management and vulnerability with less prioritization of future environmental impacts.

In addition, other differences can be identified depending on case by case analysis, nature of the hazard, a time scale of impact and social environmental factors as highlighted in table 1. However, based on the literature CCA and DRR do not overlap completely, but it is arguably to sense that the two have more similarities than differences.

Table summary

The table below shows a summary of the points of common interest and the differences between climate change adaptation and disaster risk reduction, and further shows the points of convergence. DRR deals with all hazards while CCA deals with climate change related hazards thus the key point of divergence. While as DRR has been utilizing human resource, skills and tools from humanitarian agencies, climate change is now evolving to adopt all round skills including from humanitarian, engineering and other key skills thus seen as a point of convergence. DRR is concerned with existing risks while as CCA has been dealing with anticipated risks with uncertainty. Though there exists a difference, both have a convergence point of minimizing risks as they are both aimed at creating a disaster resilient society.

Table 1. A summary analysis between the practical similarities and differences between CCA and DRR.

DRR	CCA	SIGN OF CONVERGENCY
Relevant to all hazard types	Relevant to climate-related hazards	Not applicable
Origin and culture in humanitarian assistance following a disaster event	Origin and culture in scientific theory	CCA specialists' now being recruited from engineering, agriculture, health and DRR sectors
Most concerned with the present- ie, addressing existing risks	Most concerned with the future-ie. Addressing uncertainty/new risks	DRR increasingly forward-looking Exisisting climate variability is an entry point for CCA
Historical perspective	Future perspective	Same as above
Traditional/Indigenous knowledge at community level is a basis for resilience	Traditional/Indigenous knowledge at community level may be insufficient for resilience against types and scales of risk yet to be experienced.	Examples where integration of scientific knowledge and traditional knowledge for DRR provides learning opportunities
Structural measures designed	Structural measures designed for	DRR community engaging in CCA funding mechanisms

Source: *Adopted from Tearfund group (2008)*

In summary, this chapter presented the definitions of disaster risk reduction and climate change adaptation terms as used in the research. It further critically evaluated the practical relationship between climate change adaptation and disaster risk reduction, by looking at their similarities, differences, and points of convergence. This leads to the next chapter which presents the international frameworks for climate change adaptation and disaster risk reduction regimes, and the reasons why the regimes should be linked.

3 THE INTERNATIONAL FRAMEWORKS FOR CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION REGIMES.

This chapter addresses the origin and development of climate change adaptation and disaster risk reduction regimes. It explores the international frameworks under which climate change adaptation and disaster risk reduction are established, the features of respective frameworks, development of the two regimes, and the reasons why climate change adaptation and disaster risk reduction should be linked. The order of presentation is as follows: climate change adaptation regime, disaster risk reduction regime, and the rationale behind linking climate change adaptation and disaster risk reduction regimes.

3.1 Climate change adaptation regime framework

Climate change is now a global challenge and environmentalist are devising ways of coping with the associated problems. In response, climate change adaptation is the option to counter the already impacts of climate change.[68] Currently, climate change adaptation efforts come from states, regional governments, civil society actors, and individuals in effort to adjust to 'natural or human systems in response to actual or expected climatic stimuli or effects'. [69]This is reflected in the international climate change regime where adaptation was incorporated as a principle to be considered in policies and measures for mitigation under Article 3 (3) of UNFCCC.[70] Although the UNFCCC's priority was mitigation, it also acknowledged adaptation as a commitment in Article 4.

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[68] Wanyama, A. (2015). International Legal Framework for Climate Change Adaptation and Mitigation: Prospects and Challenges, Pg.3.

[69] International Bar Association Climate Change Justice and Human Rights Task Force, Esrin, D., & Kennedy, H. (2014). *Achieving Justice and Human Rights in an Era of Climate Disruption*. International Bar Association, Pg.87.

[70] *United Nations Framework Convention on Climate Change,* (1992). Article 3 (3).

However, the development of adaptation law and policy was lagging behind to that of mitigation,[71] until recently in the Paris agreement which covered climate change adaptation extensively.[72] Thus, climate change adaptation is based on the treaty of United Nation Framework on Climate Change Convention and its legal nature is binding to the member states of the convention.[73] The UNFCCC established a procedural requirement for adaptation, directing States Parties to 'facilitate adequate adaptation to climate change' through the formulation, implementation, and publication of national adaptation measures.[74] The UNFCCC further gives attention to several areas of focus for adaptation, these includes the management and protection of coastal zones, water resources, agriculture and lands susceptible to desertification or flooding.[75]

The inclusion of climate change adaptations under the Paris agreement shows a milestone in the development of climate change regime. The Paris Agreement aims to hold global temperatures 'well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C' Article 2 (1) (a).[76] The Paris Agreement gives effect to the ultimate objective of the United Nations Framework Convention on Climate Change, to manage the global risks associated with climate change. This is by combining into one the inter-related objectives of limiting climate change, of increasing the ability to adapt to climate change, and of making global finance flows consistent with a low- emission and climate resilient development path.[77] The objective statement firmly anchors the global response to climate change within sustainable development and efforts to eradicate poverty. Only through such a comprehensive approach was it possible to achieve convergence.[78]

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[71] *International Bar Association Climate Change Justice and Human Rights Task Force-Esrin,- Kennedy* 2014, p. 87.

[72] *UNFCCC* Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, Art 7. Paris Agreement, FCCC/CP/2015/10/Add.1

[73] *UNFCCC 1992*, Art 4.

[74] *Ibid.*

[75] *Ibid*, Art 4(1)(e).

[76] *UNFCCC 2015.* Paris Agreement, Art. 2.1.

[77] *Klein et al*…2017, p. 123.

[78] *Ibid.*

Article 2 (1)(b) of the Paris Agreement provides the objective of the current climate change adaptation regime, which is "to increase the ability to adapt to adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production".[79] This is elaborated further in Article 7, which includes the global goal on adaptation. The global goal of climate change adaptation is to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change, with a view of contributing to sustainable development and ensuring an adequate adaptive response in reducing global temperatures in accordance to article 2 of the agreement.[80]

Parties to the Paris Agreement also do recognize the importance of supporting international cooperation on climate change adaptation efforts and the importance of considering the needs of developing countries and especially those who are vulnerable to adverse effects of climate change in article 7 (6) of the Paris Agreement. This recognition encourages and supports the international climate change adaptation regime and other relevant activities towards minimizing adverse impacts of climate change.[81] Furthermore, Paris Agreement requires national cooperation from the Parties through national adaptation activities.

However, 5 years prior to Paris Agreement the developing countries had prioritized in achieving parity between climate change adaptation and climate change mitigation which was a gap in the climate change regime.[82] The path to achieving this parity began in 2010 at COP16 in Cancun, Mexico where parties established the Cancun Adaptation Framework and the Adaptation Committee.[83] Also, under Cancun Adaptation Framework the Parties agreed, "adaptation must be addressed with the same priority as mitigation."[84] In COP 17 in Durban, the Parties advanced the Adaptation Framework and later in South Africa with a decision by reaffirming the Adaptation Committee as "the overall advisory body to the Conference of the

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[79] *UNFCCC 2015*. Paris Agreement, Art 2.1(b).

[80] *Ibid*, Article 7.

[81] *Ibid*, Article 7 (6).

[82] *Smith* Stanford Environmental Law Journal (SELJ) 2016, p. 1.

[83] *UNFCCC Cancun Adaptation Framework and the Adaptation Committee* 2010: Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. UNFCCC/CP/2010/7.

[84]bid.

Parties on adaptation to the adverse effects of climate change."[85] Building more on the framework, Parties solidified the placement of loss and damage at COP19 by creating the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts to serve as a loss and damage mechanism.[86]

In COP 20, the parity between climate change adaptation and mitigation was culminated with negotiations over the required elements for Parties to include in their Intended Nationally Determined Contributions, which were to be submitted prior to COP21 and in focusing for Paris Agreement.[87]

Under the Paris Agreement Article 7 (7), there is provision of ensuring parties meet this adaptation goal through the following means: "1) identifying and communicating adaptation needs and priorities, implementation and support needs, plans and actions; 2) assurance of provision of financial resources to enable planning and implementation based on developing countries' needs; 3) assessment of adequacy and effectiveness of adaptation action and support; and 4) recognition of developing countries' adaptation efforts as part of their contribution to the global response to climate change."[88]

Adaptation is multidimensional and interrelated to many aspects of socioeconomic development. This is acknowledged by linking efforts to foster climate resilience to low greenhouse gases emissions development and food security.[89] In achieving climate change adaptation, the principle of sustainable development is reflected in low emissions development efforts and achieving of food security. The 2030 agenda for sustainable development charts a

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[85] *UNFCCC Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action 2011:* Report of the Conference of the Parties on its seventeenth session, held in Durban from 28 November to 11 December 2011, Decision 1/CP.17.

[86] *UNFCCC, Warsaw; Warsaw International Mechanism 2013:* Report of the Conference of the Parties on its nineteenth session, held in Warsaw; Warsaw International Mechanism for Loss and Damage Associated with Climate Change Impact, Decision 2/CP.19.

[87] *UNFCCC, Lima Call for Climate Action 2014*: Report of the Conference of the Parties on its twentieth session, held in Lima from 1 to 14 December 2014, Decision 1/CP.17.

[88] *Ngwadla-El-Bakri* 2016, p.12.

[89] *Klein et al…*2017, p. 128.

way forward for all aspects of sustainable development and contains an explicit link to the Paris Agreement in SDG 13.[90] Climate change permeates most of the SDGs with some of them being upstream from the climate in the sense that they determine trends in net global emissions, while others are downstream from the climate in the sense that success in controlling global emissions set the boundary conditions for their achievement.[91] Adaptation and sustainability are complementary and "can yield synergistic efficiencies and benefits that advance the goals of both agenda for a society that is made more climate resilient through proactive adaptation to climate variations, extremes and changes in which development achievements and prospects are less threatened by climate hazards and therefore more sustainable."[92] A Joint pursuit of the objectives of the Paris Agreement and of the 2030 Agenda, therefore, promises to unleash powerful synergies in achieving both agendas.[93]

Article 8 of the Paris Agreement further links up climate change adaptation with loss and damage. Loss and damage is the third pillar under climate change regime through which Warsaw International Mechanism shall work in collaboration with existing bodies and expert groups under the Agreement.[94] The Paris Agreement became the first international Agreement to address loss and damage in an explicit manner, which historically treated as a component of adaptation.[95] Adaptation and loss and damage function together but are two different concepts. Loss and damage was included in the Agreement since there are some climate change impacts which cannot be adapted due to their severity and they leave permanent or significantly damaging effects.[96] Some of these climate-related impacts associated with loss and damage includes "slow-onset events like ocean acidification, desertification, and sea level rise and sudden extreme weather events like intense cyclones and flooding".[97] The eventual results from these events is loss and damage.

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[90] *United Nations General Assembly,* Resolution on transforming our world: the 2030 Agenda for Sustainable Development 2015, Goal 13.

[91] *Klein et al*...2017, *p.* 130.

[92] Leary et al…2007, p. 15.

[93]*Klein et al*...2017, *p.* 130

[94]*UNFCCC* Paris Agreement 2015, Article 8.

[95] *Kathleen -Heather* When Adaptation Is Not Enough: Paris Agreement Recognizes "Loss and Damage" 2015.

[96] *Smith* Standford Environmental Law Journal (SELJ) 2016, p. 1.

[97]*Kathleen -Heather* When Adaptation Is Not Enough: Paris Agreement Recognizes "Loss and Damage" 2015.

According to article 8 (4) of the Paris Agreement, parties "should" act cooperatively to address and minimize loss and damage associated with climate change. These areas of cooperation would include; "early warning systems; emergency preparedness; slow onset events" and also "comprehensive risk assessment and management; risk insurance facilities, and resilience of communities, livelihoods and ecosystems.[98] However, funding for loss and damage was a contentious issue between the developing countries and developed countries in the agreement negotiations.[99] The developed countries were adamant in their opposition to the creation of any legal liability or rights to compensation arising from this provision, thereby blunting the practical effect that this new provision in the climate treaty is likely to have.[100] This ended up with explanations that were not clear on how developing countries will fund for the loss and damage. Although funding was not included for loss and damage, this seems to be the future focus on subsequent COP decisions.

Paris agreement provides the current framework under which climate change adaptation thrives internationally through various measures as presented in the relevant articles. Therefore, the operationalization of the global goal on adaptation in Article 7 (1) of the Paris agreement requires "further elaboration of the concepts of climate resilience, vulnerability to climate change and adaptive capacity in relation to the temperature goal. The adequacy of global efforts, however, cannot be understood in abstract but should be placed in the context of investments being made to achieve resilience."[101] Hence the second aspect of operationalising the global goal on adaptation is to further elaborate the adequacy of the support component, which can be understood only based on adaptation needs. Climate change adaptation goal is further strengthened by the loss and damage agenda which will be further discussed in subsequent COP decisions, especially in funding for the losses and damage of climate change. A strong and flexible legal and institutional framework is a necessary pre-requisite to support the implementation of the broad range of inter-twined national and local activities that are required in response to current and prospective impacts of climate change.[102]

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[98] *UNFCCC*, Paris Agreement 2015, Article. (4).

[99] *Burns*, 2015, p. 415.

[100] *Falkner 2*016, p. 113.

[101] Ibid

[102] *Kurukulasuriya* 2017, p. 1-3.

3.2 Disaster risk reduction regime framework

In the recent past, disaster events have increased both at the intensity and magnitude. The catastrophic impact of disasters is becoming so immense with millions of people deaths, destruction of property, loss of livelihoods, widespread of other hazards like diseases and even huge economic losses.[103] And for the reasons, governments around the world have committed to act in reducing disaster risks by adopting a number of guidelines/frameworks to reduce vulnerabilities and risks to natural hazards.[104] In 1987, UN General Assembly resolution 42/169 declared the 1990s the "International Decade of Natural Disaster Risk Reduction." [105]This was followed by a series of time-bound international strategies adopted by international conferences (and later also by resolutions of the UN General Assembly): the Yokohoma Strategy and Plan of action 1994, Hyogo Framework of Action in 2005,[106] and most recently the Sendai Framework for Disaster Risk Reduction of 2015.[107]

Currently, the international regime of disaster risk reduction is based on the Sendai Framework of Disaster Risk Reduction. This framework is a 15-year voluntary, non-binding Agreement which seeks a "substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries".[108] The Framework was negotiated by governments, with technical support from UNISDR, other UN agencies, scientists and non-governmental organisations.[109]

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[103] *UNISDR Disaster statistics*, 2018.

Mata et al...2013, p. 46.

[104]*UNGA, Hyogo Framework for Action 2005-2015:* Building the Resilience of Nations and Communities to Disasters 2005, Resolution (2 (IV).

[105] *United Nations General Assembly: Resolution* 42/169 on International decade for natural disaster reduction, 1987.

[106]*UNGA, Hyogo Framework for Action (2005-2015):* Building the Resilience of Nations and Communities to Disasters 2015, Resolution (2 (IV).

[107] *UNGA, Sendai Framework for Disaster Risk Reduction (2015 – 2030)* 2015.

[108] *UNGA, Hyogo Framework for Action (2005-2015)*: Building the Resilience of Nations and Communities to Disasters 20015, p.12.

[109] *Peters et al*..2016, p. 22.

Recognizing the main objective of disaster risk reduction regime, (which is to ensure a more equitable and sustainable future with increased disaster resilience),[110] in 2005, 168 governments and other international development and humanitarian organizations adopted the Hyogo Framework for Action.[111] The HFA outlined a broad-based DRR vision encompassing governance, early warning systems, disaster knowledge management, disaster preparedness, and response. This was based on 5 priorities identifies for action which includes; to ensure that disaster risk reduction is a national and a local priority; to identify, assess, and monitor disaster risks and enhance early warning systems; to use knowledge, innovation, and education to build a culture of safety and resilience at all levels; to reduce the underlying risk factors; and to strengthen disaster preparedness for effective response and recovery at all levels, from the local to the national.[112] This ushered in the regime of disaster risk management at the international platform. HFA recommended legislation of DRR as "a critical component in moving towards a comprehensive and mainstreamed DRR approach: Adopt, or modify where necessary, legislation to support disaster risk reduction, including regulations and mechanisms that encourage compliance and that promote incentives for undertaking risk reduction and mitigation activities."*'113*

Although HFA made progress towards a more proactive and holistic approach to DRR, its achievements were scanty across regions and not well distributed across the priorities for action.[114] Furthermore, HFA did not succeed in steering a substantial reduction of disaster losses in terms of human lives and social, economic and environmental damage and spending on DRR was still largely trumped by spending on disaster relief and reconstruction according to the analysis report.[115] Therefore, the World Conference on Disaster Risk Reduction (UN,

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[110] *Clark* 2012, Building resilience: The importance of disaster risk reduction.

[111] *IRC, A guide to mainstreaming guiding principles disaster risk reduction and climate change adaptation* 2013, p. 3.

[112] *Clark 2*012, Building resilience: The importance of disaster risk reduction.

[113] *UNGA,* Hyogo Framework for Action (2005-2015): Building the Resilience of Nations and Communities to Disasters 2015.

[114] *Hare et al*...2014, p. 22.

[115] *Kellett- Caravani* Financing disaster risk reduction 2013, p. 10-21.

2012) saw a need to address disaster risk with "a renewed sense of urgency", in adopting a new and better international blueprint for DRR.[116]

In 2015, after the time frame elapsed for the HFA, the member countries agreed to establish another successor platform, The Sendai Framework for Disaster Risk Reduction 2015-2030 which was adopted at the Third UN World Conference in Sendai, Japan, on March 18, (2015).[117] This forms the current international framework under which countries are committed to minimizing disaster impacts through DRR measures. The Sendai Framework for Disaster Risk Reduction (SFDRR) (2015–2030), is organised along seven targets and four priorities for action, aiming at substantially preventing new and reducing the risk of disasters by 2030. It also recognizes that states have the primary responsibility to reduce disaster risk (Guiding Principle 19(a)), but that responsibility should be shared with other stakeholders, including local governments and the private sector (Guiding Principle 19(b)).[118]

SFDRR equally recognizes that DRR requires an all-of-society engagement and partnership (Guiding Principle 19(d)).[119] Each member state is obliged to have its own DRR plans, policies and legislation to be mainstreamed at a national level in line with the international disaster risk reduction set goals. Member states are committed to setting up action plans which should be reported in commitments with implementation progress within a period of every 5 years though UNISDR.[120] However, the member states are to implement the framework on a voluntary basis. Member states have no legal binding to implement the framework though they are encouraged to implement it.

Although SFDRR is considered non-binding "soft law" due to it being as a UN General Assembly resolution,[121] which generally does not give rise to legally binding obligations to

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[116] *Mysiak et al*... 2015, p. 3958.

[117] *UNGA*, Sendai Framework for Disaster Risk Reduction (2015 – 2030) 2015.

[118] *UNGA*, Sendai Framework for Disaster Risk Reduction 2015, Guiding Principle 19(a,b)).

[119] *Aronsson-Storrier et al*..2017, p. 502-513.

[120] *UNISDR 2*013, United Nations Plan of Action on Disaster Risk Reduction for Resilience, p. 2-5.

[121] *Martella-Grosko* 2014, p. 966.

states, the adoption of this document clearly evidences states' shared vision in terms of future steps towards real progress on DRR. It provides a framework for international and national arena for DRR action.[122]

In addition, there are other bilateral, regional and global treaties which support disaster risk reduction activities, however, they exist in different international legal platforms.[123] For example, the Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations of 1988,[124] and the Framework Convention on Civil Defense Assistance of 2000.[125] However, all these treaties have no linkage framework to climate change adaptation nor to other relevant regimes. In fact, there are more than 200 international instruments "regulating various matters related to the prevention, management of disasters and post-disaster rehabilitation and reconstruction.[126]

Also, there is a significant number of influential soft law instruments, such as resolutions, frameworks, codes, and guidelines, providing a normative basis for disaster risk management field.[127] This clearly shows that there is fragmentation of disaster risk reduction both soft and hard laws in the international system of governance. This fragmentation of both soft and hard international disaster risk reduction laws is a challenge towards establishing a clear DRR legal framework.

(Soft laws are nonbinding agreements, statements, declarations, resolutions, and recommendations which aim at providing a low-resistance path for the introduction of solutions surrounding a given environmental issue.), available (http://www.bdlaw.com/assets/attachments/418.pdf).

[122] *Aronsson-Storrier et al*… 2017, p. 507.

[123] *Peel-Fisher* 2016, p. 10.

[124] *Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations*, June 18,1998, in force, 8,2005, United Nations depositary notification C. N6008. 1998.Treaties.8 of Dec 4, 1998.

[125] *Framework Convention on Civil Défense Assistance*, 272 UNTS 213, May 22, 2000, in force Sept. 23. 2001.

[126] *De* 2012, p. 3-44.

[127] *Peel et al*..2016, p .10.

3.3 The rationale behind linking the international climate change adaptation and disaster risk reduction regimes.

This section critically evaluates the reasons why climate change adaptation and disaster risk reduction regimes should be linked together. Some of the key reasons discussed include to increase efficiency and effectiveness in the regimes, to address the conflicting legal and polices structures both at international and national levels for the two regimes, the regimes share common practical approaches, tools and stakeholders thus prudent to link them in addressing legal and institutional fragmentation, and ensuring other benefits of linkage like sharing of data and information among the regimes institutions, and facilitate towards achievement of sustainable development.

The literature identifies several compelling arguments on the reasons why CCA and DRR should be mainstreamed onto each. However, there are some scholars who have argued against the two regimes integration and why should they be treated differently. The analysis therefore presents both sides of the argument, however, for this research, it explores more on why there should be integration.

The pro-integration scholars for the two regimes have argued that linking climate change adaptation and disaster risk reduction would spell out onto several benefits, among them includes: reducing climate change-related losses through widespread DRR measures; it will ensure increased efficiency of resources (financial, human and natural, which is crucial when considering aid efficiency) and enhanced also lead to effectiveness and sustainability in management approaches used. [128] linking of these regimes wherever and whenever feasible is would often a lead to a 'win-win strategy' thus minimising climate change losses.[129]

First, both CCA and DRR share a common focus on risk-informed development. They have common objective to build a resilient community which can withstand and bounce back from crisis.[130] Both climate change and disaster risk management regimes recognize and accept that

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[128] *Gero-Dominey* 2011, p. 102.

[129] *Network* 2008, Climate change adaptation and disaster risk reduction, p. 1.

[130] *Ali 2017* Integrating climate change adaptation and disaster risk reduction.

the poor are disproportionately affected by hazards.[131] This is due to lack of access on how they can improve their resilience, whether this is in economic, social, physical, or environmental terms.[132] Poverty reduction and sustainable natural resource management are essential components of reducing vulnerability to hazards and climate change. In addition, part of sustainable development discourse entails exploring alternative DRR subsystems as well as alternative CCA subsystems, namely finding or developing DRR or CCA subsystems that are more likely to be sustainable.[133] Disaster risk reduction was a strong feature in the Rio20 outcome document. This called for "disasters to be addressed with a renewed sense of urgency in the context of sustainable development and poverty eradication, and as appropriate, to be integrated into policies, plans, programmes and budgets at all levels and considered within relevant future frameworks."[134]

Therefore, linking climate change adaptation and disaster risk reduction regimes will not only help to achieve the common objectives but also facilitate towards achieving sustainable development. It is necessary therefore to have a platform for linkage between climate change adaptation, disaster risk reduction and Sustainable Developmental Goals, especially an international framework which would be adopted for national legislation. Furthermore, the principle of sustainable development as recognised under the two regimes promote the integration of environmental, social, and economic concerns into all aspects of decision making by governments in achieving Sustainable Development Goals.[135] Linking disaster risk reduction and climate change adaptation strategies makes operational sense as it will enable countries to enhance coherence and synergies between DRR and CCA approaches, as well as maximize efficiency in terms of the human, technical and financial resources used to reach common goals, thus reducing the use of resources in duplicated institutional structures and implementation.[136]

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[131] *Venton- La Trobe* 2008, p. 5.

[132] *Thomalla et al*..2006, p. 39-48.

[133] *Burns-Machado Des Johansson* 2017, p. *13.*

[134] *Hillier-Nightingale* 2013, p. 1.

[135] *UNDP*, Sustainable Development Goals (SDGs) 2015.

[136] *Nicola et al*… 2018, p. 8.

Secondly, linking climate change adaptation and disaster risk reduction will foster sharing of information, experience and expertise across DRR and CCA institutions.[137] Based on the report assessment, by on global risk assessment report by GAP 2011, information sharing between DRR and CCA regimes was identified as a key challenge towards addressing climate related disaster risks.[138] The report further recommended institutional linkage for data sharing on climate related risk management.[139] This would impact the outcome in addressing both climate change and disaster risks by use of existing tools and methods. Collaboration among multiple levels of government increases the effectiveness of CCA and DRR integration. Often the design of some national governance systems does not facilitate collaboration. For example, in Australia the current architecture of the federal system provides limited space for tackling complex issues such as climate change and risks. The political system tends to encourage vagueness, duplication of responsibilities, and conflicts.[140] However, these challenges can be addressed though an international linkage framework and institutional linkage which can be adoption at national levels. The Red Cross and Red Crescent (2013) under their guideline for integration further supports the establishment of a legal framework and institutional linkage between CCA and DRR.[141]

Thirdly, linking climate change adaptation and disaster risk reduction regimes would utilize common approaches and tools towards addressing climate change hazards and environmental risks. For instance, disaster risk reduction has a long history of practice in communities previously focusing on response and recovery, which resulted in forming experience, tools, networks, knowledge, and institutions.[142] These tools would be used in addressing the common challenges for the two regimes rather than reinventing the tools for climate change adaptation.[143] This would avoid wasting financial, human, and natural resources. Thus,

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[137] *Olhoff* 2011, p. 26-29.

[138] *Ibid.*

[139] *Ibid*, p. 27.

[140] *Forino et al*…International Journal of Disaster Risk Science 2015, p. 375.

[141] *IRC/S* 2013. Mainstreaming DRR and CCA: a guide to mainstreaming guiding principles disaster risk reduction and climate change adaptation, p. 6.

[142] *Jansweijer* 2014, p. 13.

[143] *Mercer* Journal of International Development 2010, p. 263.

integration could lead to enhanced effectiveness and make the concepts more comprehensible for communities and individuals.[144]

Fourthly, linking climate change adaptation and disaster risk reduction regimes shall provide opportunities to strengthen the management of common areas like climate change and environmental hazards, natural hazards and other risks which would eventually lead to disasters. In addition, DRR needs to shift to a long-term risk prevention approach to address the short-term and long-term risks associated with climate change.[145] This shared learning will strengthen the rigor, robustness, effectiveness and efficiency in addressing climate change and disaster risks long-term.[146] An integral part of linking climate change adaptation and disaster risk reduction regimes would be through establishment of a legal framework to link DRR and CCA.

Developing countries who are more vulnerable to both climate change impacts and disasters can establish legislations and policies addressing these challenges jointly for efficient utilization of resources. An international legal framework linking the two regimes is likely to compel national states to adopt an integrated national policy and legislation. Fragmented legislation and policies internationally for the two regimes might lead to redundant and conflicting responses at regional and national level.[147] To avert such future conflicts between the CCA and DRR policies and legislation especially for the developing countries, linking the two regimes would spell better options and therefore making the adoption streamlined to national levels and community activities. Many adaptation mechanisms can be strengthened through: good governance, human resources, institutional structures, public finance, and natural resource management.[148] Such progress will help in building resilience of countries, communities, and households to climate change impacts and disasters.[149] Coping strategies to climate change impact and disasters can provide a good starting point for addressing adaptation

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[144] *Jansweijer* 2014, p. 14.

[145] *Nicola* et al… 2018, p. 8.

[146] Ibid.

[147] *Rivera* 2014, p. *6*

[148] *Marquina* 2012, p. 21.

[149] *Abeygunawardena et al*…2002, p.8.

needs in the context of poverty reduction. Furthermore, learning from experience can also help prevent the underachievement of sustainable development efforts and avoid maladaptation.[150]

Although there are efforts to link climate change adaptations and disaster risk reduction regimes based on the reasons discussed above,[151] it is still a challenge to merge the two regimes due to the difference in their legal nature and different institutional framework.[152] There is a challenge in reconciling the existing global policy arenas, including not only those that relate to adaptation and DRR, but also to climate change mitigation, development assistance. Weak regulatory frameworks and institutional capacity constraints with limited financial and technical resources tend to prevent their implementation or enforcement in practice at national level.[153] This calls for international support to enable countries achieve linkage between the two regimes. This would be achieved better through an international legal and institutional framework to enable downward adoption of policies and regulations which would then help in mainstreaming the two regimes.[154]

Contrary, there are those of the rather opinion that the two regimes should not be integrated due to the existing differences between CCA and DRR. They argue that despite the clear reasons and benefits of linking climate change adaptation and disaster risk reduction, the two regimes are established in different frameworks, operate under different communities of research and practice, have different implementation agencies, and receive their funding from different sources under different institutions.[155] These differences make it difficult to initiate a dialogue between DRR and CCA agents, even though these relations are critical for a successful integration.[156] However, the reasons and challenges given for separating DRR and CCA would be addressed with political goodwill, and an international linkage framework to

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[150] *Abeygunawardena et al*…2002, p. 1-14.

[151] *Kelman.* International Journal of Disaster Risk Science 2015, p, 125.

[152] *International Federation of Red Cross and Red Crescent Societies* 2013, A Guide to Mainstreaming Disaster Risk Reduction and Climate Change Adaptation, p. 1-62.

[153] *Olhoff* 2011, p. 33.

[154] *International Federation of Red Cross and Red Crescent Societies* 2013, A Guide to Mainstreaming Disaster Risk Reduction and Climate Change Adaptation, p. 1-62.

[155] *Jansweijer* 2014, p. 14.

[156] Mitchell et al..2008, p. 1-22.

address some of these concerns. For instance, a legal framework would be established under climate change adaptation regime to link the DRR framework. Also, now it is evident that in some countries, practical activities and programmes for climate change adaptation and disaster risk reduction would be carried out together.

Those of the contrary opinion in linking climate change adaptation and disaster risk reduction regimes further argue that the origin of the regimes eludes to differences in approaches within them.[157] While as CCA is based on a Top-down approach and embedded in hard international law, DRR uses both Top-down and Bottom-Up approaches with mainly soft international laws.[158]. However, the two regimes are now undergoing evolutionally changes in the approaches used. For instance, in the recent Paris agreement which makes the current legal framework was adopted with both Top-down and Bottom-Up approaches.[159] It is possible to apply both approaches in the two regimes. This also refers to the practical approaches where adaptive approach in risk management is common.[160] Besides, since climate change adaptation and disaster risk reduction aim and minimizing vulnerability and risk management to a resilient society, use of both regimes approaches would ensure effective management of environmental hazards.

In summary, the chapter presented an analysis on the origin and development of the international frameworks for climate change adaptation and disaster risk reduction regimes. It gives a critical review of the historical development of the frameworks for climate change adaptation and the current frameworks for the two regimes. The chapter also presents the reasons to why the international climate change adaptation and disaster risk reduction frameworks and institutions should be linked. The next chapter gives an analysis account of the progress of linking climate change adaptation and disaster risk reduction frameworks and their respective institutional cooperation/linkage.

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[157] *Birkmann-Pardoe* 2014, p. .48.

[158] *Jansweijer* 2014, p. 14.

[159] *Falkner* 2016, p. 1107-1125.

[160] *Birkmann et al*… 2011, p. 22-27.

4 LEGAL FRAMEWORK AND INSTITUTIONAL LINKAGES BETWEEN CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION REGIMES.

This chapter assesses the legal frameworks and institutional linkage between climate change adaptation and disasters risk reduction regimes. It has been presented in the following order: definition of terms (Linkage framework), disaster risk reduction in climate change adaptation framework, climate change adaptation in disaster risk reduction framework, Institutional linkages (climate change adaptation institutions, disaster risk reduction institutions) and their functional relationship.

4.1 What is a linkage framework in international environmental law?

The international environmental law is now characterized by an increasing number of multinational agreements some based on hard law treaties while others based on soft law instruments in dealing with environmental challenges.[161] Multilateral environmental agreements are also supplemented with additional institutional arrangements which facilitate further development of treaty regimes and to supervise their implementation and enforcement.[162] This has resulted in a "forest" of different secretariats, Intergovernmental Organizations , COPs and MOPs that are predominately un-coordinated which is also refereed as legal/institutional fragmentation .[163] The further resulting effect of fragmentation of environmental laws includes conflict of roles, duplication of roles by different institutional arrangements, ineffective utilization of resources and thus weakening the implementation course.[164]

However, in dealing with fragmentation of international environmental laws, many scholars have suggested approaches in solving the challenge among them being to establish a linkage framework for cooperation between regimes addressing common goals and

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[161] *Zelli- Van Asselt* 2013, p. 1-13.

[162] *Zovko* 2005, p. 112.

[163] *Ibd*.

[164]. *Zelli- Van Asselt* 2013, p. 1-13.

objectives.[165]Among the regimes which share common objectives and goals is climate change adaptation and disaster risk reduction regimes. Although the regimes are based on different frameworks with different legal nature, where climate change adaptation is based on a legally binding framework of the Paris Agreement 2015 under the UNFCCC 1992 Treaty[166] and disaster risk reduction is established on a "soft" international law under the framework of the United Nations General Assembly resolution 2015, The Sendai Framework for Disaster Risk Reduction 2015-2030.[167] The regimes would be linked up to effective implementations of the common objectives.

A linkage framework in international environmental law is derived from the theory of functional cohesion as a means of operationalizing multimodal and integrated approach to implementation, which represents an important rethinking of international environmental regimes linkage.[168] This is further supported by "polycentric governance" which is an approach to management of international environmental challenges. Climate change adaptation and disaster risk reduction linkage framework would be established based on "polycentric governance" which aims to leverage the relationship among multiple nodes of authority to achieve regulatory goals (e.g. Elinor Ostrom).[169]

International climate change adaptation and disaster risk reduction regimes are well placed to be linked up since they have an underlying connection of environmental risk and vulnerability management, and they have interconnection of actors involved in their objectives implementations.[170] Establishing linkage framework between environmental regimes with common goals is not a new phenomenon in the international environmental law, for instance, the link between desertification, biodiversity conservation, and climate change is well-

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[165] *Lyman* 2015, p. .*4*.

[166]*UNFCCC* 2015, Paris Agreement.

[167] *UNGA 2015*, Sendai Framework for Disaster Risk Reduction (2015 – 2030).

[168] *Lyman* 2015, p. 1-5.

[169] *Long- IUCN AEL Colloquium* (July 2, 2012), Linkage in 21st Century Global Environmental Governance.

[170] *International Federation of Red Cross and Red Crescent Societies* 2013, A Guide to Mainstreaming Disaster Risk Reduction and Climate Change Adaptation, p. 1-62.

recognized interface under the auspices of the United Nations to Combat Desertification framework in 1996.[171]

In the recent times, according to the literature there are efforts towards linking climate change adaptation and disaster risk reduction regimes towards addressing environmental risks.[172] However, the two regimes have evolved separately despite the common agenda of linking them.[173] Below is an analysing on the progress and efforts towards establishing a linkage platform for climate change adaptation and disaster risk reduction.

4.2 Linking disaster risk reduction to climate change regime framework

Climate change adaptation regime recognizes disaster risk reduction measures in managing environmental risks. This is reflected in the current climate change adaptation framework under the Paris agreement, especially in Article 7-8 which frames climate change adaptation, and loss and damage respectively.[174] There is an opportunity to ensure that climate change adaptation advancement is coherent with the ongoing global efforts to reduce disaster risks and losses.[175] This is further strengthened by sustainable development agenda.The achievement of many sustainable development goals including those related to poverty, hunger, climate action, sanitation and clean water will depend on how the Paris Climate Change Agreement, Sendai Framework of Disaster Risk Reduction and 2030 Sustainable Development Goals agenda are linked up together in implementation in order avoid duplication.[176] All these regimes have a common goal of creating a resilient and sustainable development oriented society, which aims to minimize both human vulnerability and environmental risks..

Resilience is defined by UNISDR as "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a

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[171] *United Nations Convention to Combat Desertification* 1994, entered into force December 26, 1996.

[172] Keweloh, R. Integrating Disaster Risk Reduction and Climate Change Adaptation in Theory and Practice, Pg. 4-10.

[173] Ibid 164

[174] *UNFCCC* 2015, Paris Agreement. Article 7 and 8.

[175] *UNFCCC- Glasser* (22nd MAY 2017), UN Climate Change Newsroom: 87 Countries Should Systematically Account for Disaster Losses by 2020 Outcome of 2017 Global Platform for Disaster Risk Reduction.

[176] *UNISDR-Margareta Wahlström* (22 Dec 2015), Paris Agreement shows political will to reduce disaster risk.

hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management."[177]

The Paris Agreement highlights resilience as an integral component of climate change adaptation, which is linked to concepts of building adaptive capacity and reducing climate change vulnerability.[178] This gives resilience a more prominent role than in previous climate change agreements, where resilience was given minimal attention. Paris Agreement also places "emphasis on the resilience of, and links between, socioeconomic and ecological systems."[179] In featuring the usage of the term 'resilience' in climate change adaptation regime, it first featured in COP 13 (2007) under climate change regime, where it was used only once.[180] It was later used again in COP 15 (2009) in relation to the adverse impacts of climate change.[181] In COP 16 (2010) resilience was embedded within the adaptation discourse, thus reflecting the rising popularity of the term globally, including as a way of linking climate change adaptation and disaster risk reduction.[182] Until 2015, when resilience featured prominently especially under climate change adaptation. This was particularly in building adaptive capacity and reducing vulnerabilities to the adverse effects of climate change. Like adaptive capacity, it is a characteristic to be 'strengthened', 'built' or 'fostered.[183] The chronological feature of resilience in climate change adaptation regime has been an important development towards disaster risk reduction and climate change adaptation linkage.

Disaster risk reduction under the Sendai Framework also calls for a substantial increase in the availability of, and access to, multi-hazard early warning systems and disaster risk information by 2030, an activity mentioned in Article 8 of the Paris Agreement which also references the

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[177] *UNISDR* 2007, Definition of terminologies: Resilience.

UNFCCC 2011, COP report.

[178]*Peters et al*… 2016, p. 16.

[179] *UNFCCC* 2015, Paris Agreement. Article 8 (4).

[180] *UNFCCC 2007*, Report of the Conference of the Parties on its thirteenth session, held in Bali from 3 to 15 December 2007.

[181] *UNFCCC* 2009, COP 15.

[182] *UNFCCC* 2010, COP 16.

[183] *Peters et al*... 2016, p. 16.

resilience of communities, livelihoods and ecosystems.[184] Article 8 of the Paris Agreement, requires parties to cooperate and facilitate, take action and support areas of risk management which would include: Early warning systems, emergency preparedness, slow onset events, comprehensive risk assessment, both economic and non-economic losses and lastly the resilience of communities, livelihoods, and ecosystems.[185] The same risk management intervention areas are also well covered as priority areas for action under the Sendai Framework for disaster risk reduction.[186] Linking the climate change adaptation and disaster risk reduction regimes is further supported under Article 8 (5) of the Paris Agreement which states that "the Warsaw International Mechanism shall collaborate with existing bodies and expert groups under the Agreement, as well as relevant organizations and expert bodies outside the agreement."[187]

Even though this provides a platform for future linkage between different groups and relevant organizations outside the agreement, it is not clearly framed on which organizations and under the mechanism of cooperation in terms of funding and other resources. The research assessment finds this as a gap for future COP conferences to negotiations and maybe establish a legal platform for linkage between climate change adaptation and disaster risk reduction regime. Although disaster risk reduction is based on a different note-legally binding framework, climate change adaptation would provide a legal linkage framework for both CCA and DRR regimes. However, this would be an option depending on future negotiations within the regimes.

4.3 Linking climate change adaptation to disaster risk reduction regime framework.

Climate change adaptation has been featuring in disaster risk reduction regime through the origin of disaster risk management under the Hyogo Framework for Disaster Risk Reduction 2005-2015,[188] through to the current regime under the Sendai Framework of Disaster Risk

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[184] *UNFCCC-Robert* (22nd MAY 2017), UN Climate Change Newsroom: 87 Countries Should Systematically Account for Disaster Losses by 2020 Outcome of 2017 Global Platform for Disaster Risk Reduction.

[185] *UNFCCC* 2015, Paris Agreement, Art. (8).

[186] *UNGA 2*015, Sendai Framework for Disaster Risk Reduction (2015-2030), 14-21.

[187] *UNFCCC* 2015, Paris Agreement, Art. (8.5).

[188] *UNGA* 2005, Hyogo framework for action 2005-2015.

Reduction 2015-2030.[189] However, according to literature, there is no legal framework which links climate change adaptation to disaster risk reduction regime since the entire regime is based on a non-legal (SFDRR) framework.[190] The principle was to guide member parties of the Hyogo framework for action in strengthening the relationship between climate change adaptation and disaster risk reduction.

The Sendai Framework for Disaster Risk Reduction mentions the phrase ‘‘climate change’’ 15 times in its 50 paragraphs, compared to the HFA 2005-2015 (UNISDR 2005), which mentioned the phrase 13 times in 34 paragraphs.[191] The several mentions indicate a progress towards establishing a clear relationship and linkage between climate change adaptation and disaster risk reduction. Several paragraphs in the SFDRR mention how climate change affects disasters, and on the efforts of collaborative synergies in managing climate related disasters. For instance, paragraph 4 states ‘‘Disasters, many of which are exacerbated by climate change and increasing in frequency and intensity, significantly impede progress towards sustainable development’’.[192] SFDRR calls on support for the development of a coherent global and regional follow-up with other relevant mechanisms for sustainable development and climate change.[193] The Sendai Framework for Disaster Risk Reduction further acknowledges the mandate of the UNFCCC as the primary oversight body for climate change policy.[194] It also highlights the role that climate change plays towards increased disaster risks, as well as the ability of adaptation and resilience-building to reduce disaster risk and achieve sustainable development.[195]

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[189] *UNGA* 2015, Sendai framework for disaster risk reduction (2015– 2030).

[190] *Kelman*- International Journal of Disaster Risk Science 2015, *p.* 117-127.

[191] *Kelman* 2015, p. 120.

[192]*UNGA* 2015, Sendai Framework of Disaster Risk Reduction, p. 4.

[193] *UNGA* 2015, Sendai Framework of Disaster Risk Reduction, p. 14.

[194] *United Nations Climate Change Secretariat* 2017, Technical paper by secretary: Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction (2015–2030).

[195] *Ibid.*

According to COP 23 (UN system) side event meeting report, the process of linking climate change adaptation and disaster risk reduction regimes through regional agencies, and initiatives is in progress.[196] Regional initiatives have made important advances in promoting coherence in DRR and CCA policy frameworks. For instance, in the Pacific region, small island developing States are pursuing an interconnected approach to implementation of the 2030 Agenda with the Small Island Developing States Accelerated Modalities of Action Pathway, the Sendai Framework, and the Paris Agreement on climate change.[197] Also, in the European Union, both disaster risk reduction and climate change adaptation are integrated into policies and strategies, including critical infrastructure protection, agriculture, health, environmental protection and key financial instruments.[198] Such regional initiatives of linking climate change adaptation with disaster risk reduction would be further strengthened with an international linkage framework which is legally binding within the climate change regime. This would mandate all member parties within the two regimes to adopt national legislation and policy frameworks which would ensure practical linkage.

While climate change adaptation and disaster risk reduction relationship is more elaborated under the current DDR framework compared to previous HFA framework, the SFDRR is found lacking an appropriate framing of climate change.[199] SFDRR's recommendations focuses on tackling the root causes of disaster risk, namely vulnerability, is a good approach, however it is undermined because it only focuses to address one hazard (climate change), which is also addressed in a separate intergovernmental process.[200] SFDRR states,

"Addressing climate change as one of the drivers of disaster risk, while respecting the mandate of the United Nations Framework Convention on Climate Change, represents an opportunity

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[196] *UNFCCC* 2017, COP-23 UN System Side Event on 'Disaster Risk Reduction - DRR', p. 1-5.

[197] *Ibid.*

[198] *Ibid.*

[199] Kelman, I. (2015). Climate change and the Sendai framework for disaster risk reduction. *International Journal of Disaster Risk Science*, *6*(2), 125.

[200] Kelman, I. (2015). Climate change and the Sendai framework for disaster risk reduction. *International Journal of Disaster Risk Science*, *6*(2), 125.

to reduce disaster risk in a meaningful and coherent manner throughout the interrelated intergovernmental processes."[201]

However, it further doesn't give a clear framework under which interrelated institutions and policies can be linked to climate change adaptation and disaster risk reduction regimes. This calls for opportunities to establish a more elaborate, clear linkage framework between climate change adaptation and disaster risk reduction.

In focusing the opportunities for linkage framework between climate change adaptation and disaster framework, the two regimes share common goals towards sustainable development.[202] Under the support of the international principle of sustainable development, climate change adaptation and disaster risk reduction will support meeting the global sustainable developmental goals. In addition, SFDRR aims towards creation a resilient society from natural disasters. SFDRR priority number 3 defines that disaster risk reduction regime prioritizes investing in disaster risk reduction resilience. Internationally, this priority will be achieved by "*promoting cooperation between academic, scientific and research entities and networks and the private sector to develop new products and services to help to reduce disaster risk, in particular, those that would assist developing countries and their specific challenge.*"[203]

The same applies to climate change adaptation regime, which also aims to establish resilience to climate change impacts, this is well covered under the Paris Agreement Article (7.9 (e)) and (8.4 (h)).[204] Resilience is one of the linking factors for climate change adaptation and disaster risk reduction frameworks, however, it has not been clearly linked between the regimes. This is apparent in the SDRR which despite mentioning resilience as one of the top priorities of investment, it is now well linked to other relevant environmental regimes. Perhaps future negotiations and global measures shall need to identify appropriate mechanisms for creating a linkage with other regimes with a focus on creating disaster resilient society.

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[201] *United Nations General Assembly*, Resolution adopted by the General Assembly on 3 June 2015, p. 5. A/RES/69/283.

[202] UNFCC, (2017). Technical paper by the secretariat: Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction 2015–2030

[203] *United Nations General Assembly*, Resolution adopted by the General Assembly on 3 June 2015, par. 31 (c).

[204] *UNFCCC Paris Agreemen*t 2015, Art. 7.9 (e)), (8.4 (h)).

To reduce disaster and climate change risk, exposure needs to be minimized, vulnerability reduced, and capacities for resilience strengthened in ways that address both disaster and climate change risk simultaneously, neither approach compromising the other.[205] These would be achieved with better linkage framework between DRR and CCA regimes from the international level to local activities. Thus, the respective international regimes should establish convergence point/ linkage within their frameworks.

Relationship between climate change adaptation and disaster risk reduction frameworks

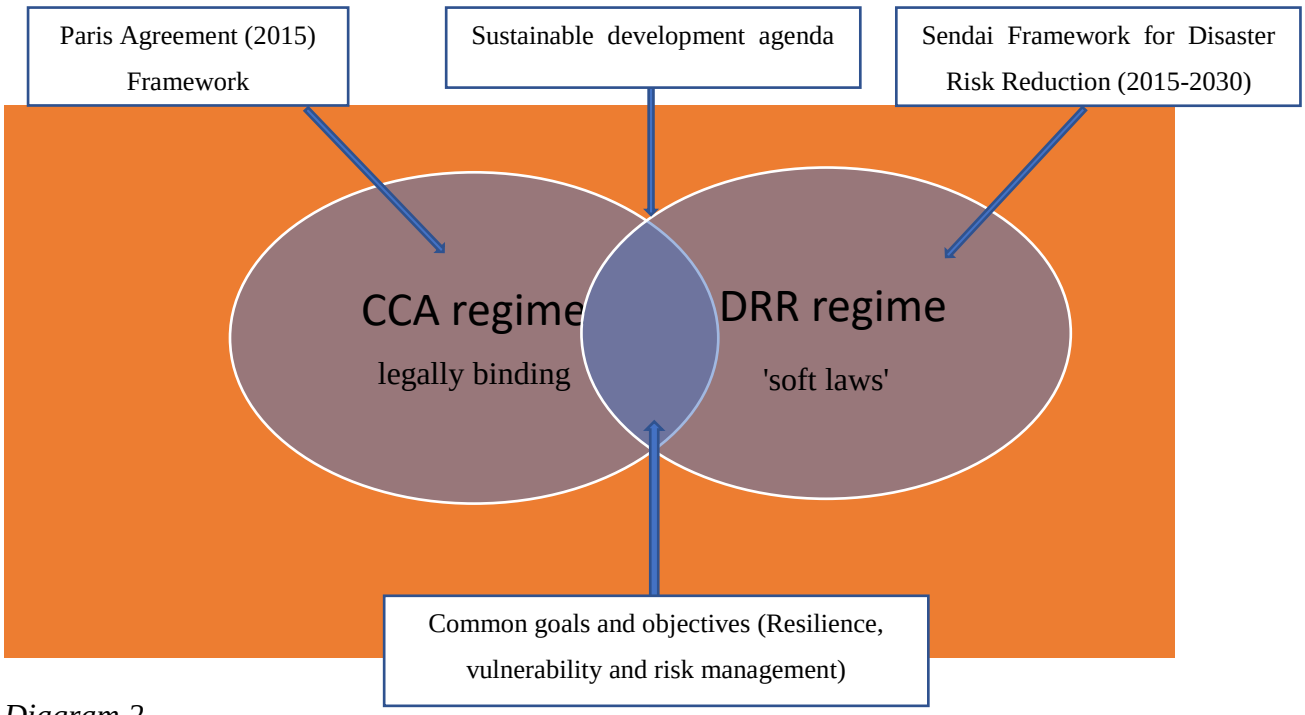

Diagram 2.

DRR- Disaster risk reduction regime

CC- Climate change adaptation regime

Summary of the diagram representation.

The diagram represents the research analysis of climate change adaptation and disaster risk reduction regimes based on their respective frameworks. It further shows the common goals and objectives which are (Resilience, vulnerability and risk management). The common goals represented in the two regimes would be used as basis of establishing a linkage framework,

[205] *Manzoor* 2013, p. 8.

which will facilitate meeting the sustainable development goals. Despite that climate change adaptation and disaster risk reduction regimes are established in different international frameworks, and the different legal nature of the frameworks, they have a common linking factor which would be developed further in future. However currently, there is no linkage framework between climate change and disasters risk reduction in their respective international regimes.

4.4 Institutional linkage between climate change adaptation and disaster risk reduction regimes

Institutional linkage in international environmental law emerged as a response to the problem of managing global dilemma in an anarchic world that is governed by weak and fragmented international institutions.[206] It can also be regarded as an institutional interaction where environmental institutions share some common objectives in different environmental regimes. A linkage is designed to unleash 'hidden synergies between regimes' and builds upon those connections to improve international environmental governance.[207] For this case, climate change adaptation institutions have similar functionalities with those of disaster risk management institution, which would be strengthened further with an institutional linkage. According to Red cross guideline 2013, it is necessary to designate an overarching body to develop strategies, define responsibilities at different levels of the organizations, coordinate this multi-sector, multi-tied engagement, monitor and evaluate the progress of linking DRR and CCA.[208] This will not only create a collaborative synergy between the institutions but also establish a platform for information sharing. Alternatively, institutional linkages between climate change adaptation and disaster risk reduction would be the solution instead of a new international overall institution for both DRR and CCA regimes.

As with many other types of linkages that arise in international law, for example, trade and environment, human rights and security among many other fields, a key question concerns how better coordination can be achieved between institutions and approaches dealing with

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[206] *Scott* 2011, p. *8*.

[207] *Ibid.*

[208] *International Federation of Red Cross and Red Crescent Societies* 2013, A Guide to Mainstreaming Disaster Risk Reduction and Climate Change Adaptation, p. 9.

overlapping issues from different perspectives. Calls for enhanced coordination in dealing with disaster risk reduction come from all sides.[209] For instance, the Sendai Framework articulates as a guiding Principle that:

"*The development, strengthening and implementation of relevant policies, plans, practices and mechanisms need to aim at coherence, as appropriate, across sustainable development and growth, food security, health and safety, climate change and variability, environmental management and disaster risk reduction agendas. Disaster risk reduction is essential to achieve sustainable developmen*t."[210]

However, although the links between disaster risk reduction and climate change adaptation regimes are increasingly recognized at a political level, a substantial "disconnect" persist between the regimes.[211] According to the Intergovernmental Panel on Climate Change, this reflects "different institutional structures and lack of awareness of linkages."[212] As Anne Sider notes, this may lead to common terms like "resilience" to be understood in substantially different ways in the different regimes.[213] Achieving better coordination between disaster risk reduction, environmental protection, and sustainable development is likely to require more than just the articulation of common languages; it will also be necessary to identify and develop workable models and approaches for bridging the gap between practices in climate change adaptation and disaster risk reduction areas. Working on this progress in different platforms sometimes leads to fragmentation which comes with challenges of coordination.

Disaster risk reduction and climate change occupy separate policy spheres, and institutional frameworks in the international arena, and usually also at national levels even though they interplay and overlap on each other.[214] Tracing the historical framework institutions, DRR is based on the United Nations General Assembly resolution Framework of Action while as CCA is embodied in the climate change regime under the United Nation Framework Convention on

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[209] *Peel-Fisher* 2016, p. 22.

[210] *UNGA* 2015, Sendai Framework of Disaster Risk Reduction, *Para 19 (h).*

[211] *Peel-Fisher* 2016, p. 22.

[212] *IPCC* 2007, Work Group II: Impacts, Adaptation and Vulnerability, Section 20.5.

[213] *Peel-Fisher* 2016, p. 101-120

[214] *Forino et al…*International Journal of Disaster Risk Science 2015, p. 373.

Climate Change (UNFCCC).[215] The institutional frameworks for climate change adaptation and disaster risk reduction parties therefore, originate from different institutions with different legal characteristics. As one way of linking climate change adaptation with disaster risk reduction regimes, there is need for institutional collaboration in coordination of the common activities. It will not only improve the efficiency of coordination, but also provide a platform for knowledge, technological know-how, and better resource management.[216] The key climate change adaptation and disaster risk reduction institutions as established with their respective objectives and functions are as follows:

4.4.1 Climate change adaptation regime institutions

Some of the key international climate change adaptation regime institutions with together with their functions or mandates includes:

(I) *Adaptation Committee (AC)*-It was established under the Cancun Adaptation Framework in (2010) to promote the implementation of enhanced action on adaptation in a coherent manner under the Convention. Its functions include: Providing technical support and guidance to the Parties; Sharing of relevant information, knowledge, experience and good practices; Promoting synergy and strengthening engagement with national, regional and international organizations, centres and networks, Providing information and recommendations, drawing on adaptation good practices, for consideration by the COP when providing guidance on means to incentivize the implementation of adaptation actions, including finance, technology and capacity-building, and Considering information communicated by Parties on their monitoring and review of adaptation actions, support provided and received.[217]

(II) *Warsaw International Mechanism (WIM)*- WIM looks to promote and enhance comprehensive risk management approaches through risk assessment, reduction and transfer. It also aims to provide information on risk pooling and transfer, catastrophe risk insurance and other instruments that address Loss and Damage through financing.[218] Under the Paris Agreement, it was included under the 3rd pillar of climate change regime, (Loss and Damage). Loss and

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[215] *Ibid.*

[216] *Carlarne* 2012, *p. 30-42.*

[217] *UNFCCC* 2010, Cancun Adaptation Framework.

[218] *African Risk Capacity* 2017, Fact sheet, p. 1-2.

damage have been existing under climate change adaptation, but in the Paris agreement 2015, his was a success after being included under Article 8, with specific mention made of insurance and climate risk pooling. It states that the 195 Parties to the Agreement must boost their understanding, action and support relating to climate change-caused Loss and Damage.[219] These shall include the following: Early warning systems; Comprehensive risk assessment and management, and Risk insurance facilities, and climate risk pooling and other insurance solutions.[220] Within the COP 21 Decisions, which were adopted by the Parties in Paris and which give effect to the Agreement, paragraphs 48 to 52 on Loss and Damage outlines the future work plan for comprehensive climate risk management.

(III) *The Adaptation Fund (AF*)- It was established in 2001 to finance concrete adaptation projects and programmes in developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change. The Adaptation Fund is supervised and managed by the Adaptation Fund Board (AFB).The AFB is composed of 16 members and 16 alternates and meets at least twice a year (Membership of the AFB).[221] The functions of the Adaptation Fund Board include the following functions and any other functions assigned to it by the CMP:Develop strategic priorities, policies and guidelines, and recommend their adoption to the CMP, Decide on projects, including the allocation of funds, in line with the Adaptation Fund principles, criteria, modalities, policies and programmes, in accordance with decision 5/CMP.2. Monitor and review implementation of the operations of the Adaptation Fund, Report on its activities at each session of the CMP and among other activities assigned to it.[222]

4.4.2 Disaster risk reduction regime institutions

Some of the key disaster risk reduction institutions and their key functions includes:

(I) *International Decade for Natural Disaster Reduction Secretariat*

An International Decade for Natural Disaster Reduction, beginning on 1 January 1990, was launched by the United Nations, following the adoption of Resolution 44/236 (22 December

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[219]UNFCCC/CP/2015, (COP 21), Article 8.

[220] *African Risk Capacity* 2017, Fact sheet, p. 1-2.

[221] UNFCCC, Adaptation Fund.

[222] UNFCCC. Adaptation Fund Board, Functions of the adaptation fund institution.

1989).[223] The Decade was intended to reduce, through concerted international action, especially in developing countries. The UN General Assembly established this secretariat organisation to coordinate, monitor the progress and report its activities. However, this was later succeeded by a more specialized secretariat for the DRR movement.

(II) The United Nations International Strategy for Disaster Reduction (UNISDR)

The United Nations International Strategy for Disaster Reduction Secretariat was established in 1999 as the successor to the Secretariat of the International Decade for Natural Disaster Reduction. It was established to support and coordinate disaster risk movement and management activates.[224] UNISDR was to lead UN member states towards the achievement of Hyogo Framework for Action, 2005-2015.

The formal mandate of UNISDR is given by the UN General assembly and is to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organisations and activities in socio-economic and humanitarian fields. UNISDR and its activities are funded wholly by extra-budgetary resources through the trust fund for disaster reduction. Just like other adaptation institutions in climate change regime, UNISDR coordinates international efforts in disaster risk reduction and to guide, monitor and report regularly on the progress of the implementation of Hyogo Framework for Action 2005-2015 and now the Sendai Framework of Action.[225]

International climate change adaptation and disaster risk reduction institutions with their respective mandates and functions can be analysed as represented in the diagram below. The diagram has been used to represent the pictorial form of the various institutions, their international frameworks of origin, and the common roles and mandates of the institutions for CCA and DRR regimes.

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[223] A/RES/44/236, UN General Assembly, (1989)

[224]Australian Multilateral Assessment 2012, p, 1.

[225] UNISDR, Coordination. (https://www.unisdr.org/we/coordinate).

Diagram 3. Representation of the international CCA and DRR institutional Relationship.

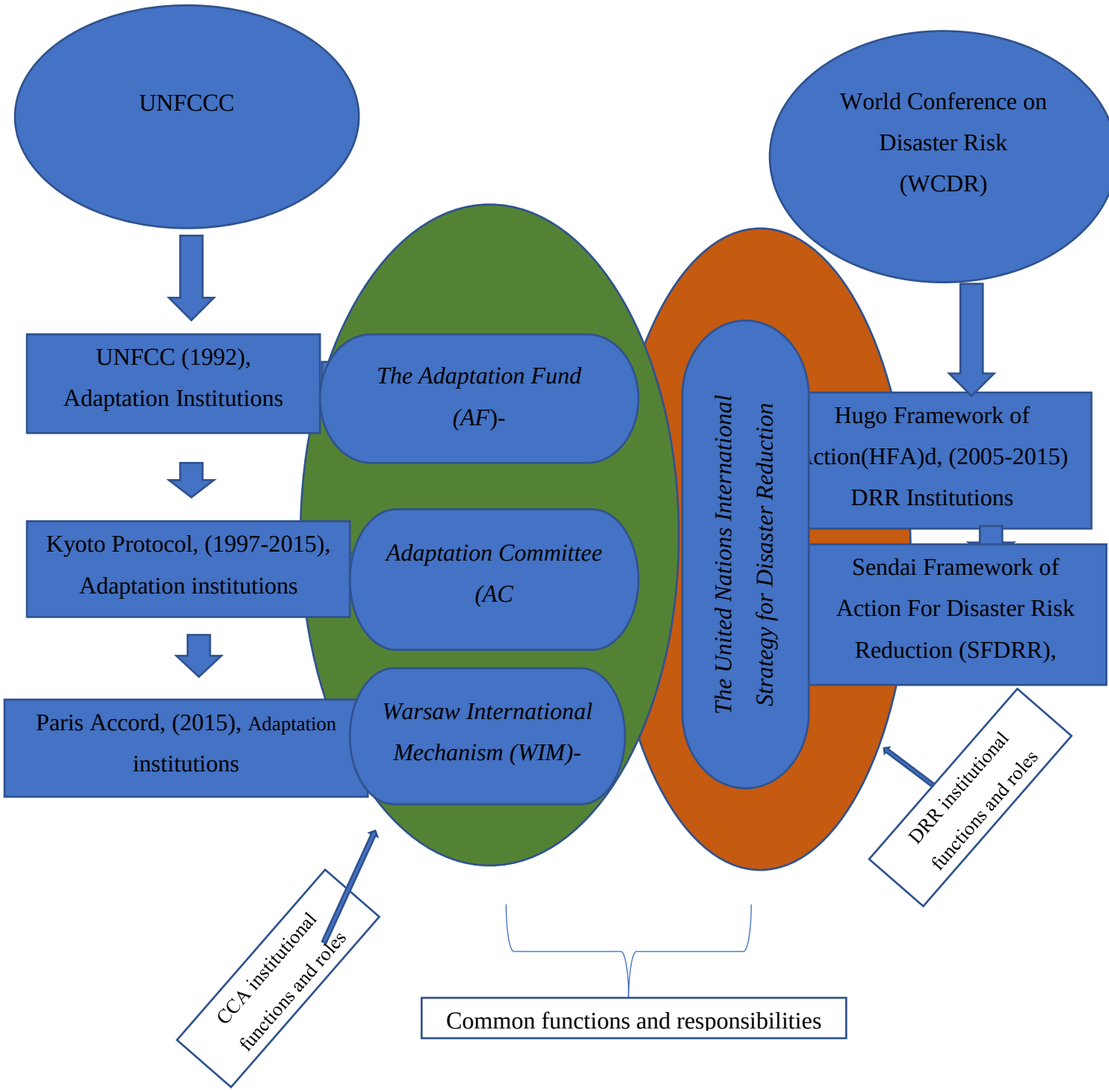

Diagram summary

The diagram above shows the relationship between agencies and organisations established in climate change adaptation and disaster risk reduction regimes. They are all established independently in their own regimes however with common functions and responsibilities which are meant to meet a common objective.

The diagram represents climate change adaptation institutions and disaster risk reduction institutions based on their respective frameworks. It shows further the relationship between climate change adaptation functions which are commonly shared with disaster risk reduction institutions. In summary, some of the shared common functions between climate change adaptation institutions and disaster risk reduction includes:

1) Establishing data and information on risk management progress.
2) International coordination of various activities and management programme for risk management.
3) Facilitation in establishment of policies, programs and activities towards resilience.
4) Financial and material resource mobilization.

For effective communication and sharing of information between climate change adaptation institutions and disaster risk reduction institutions, a linkage framework should be established.[226] This would be done at national level, however an international framework for linkage would reinforce the synergies of cooperation between climate change adaptation and disaster risk reduction. Funding and resource mobilisation for risk management would be facilitated effectively with well-coordinated link between DRR and CCA regime institutions.[227] Aligning institutions and negotiation tracks under UNFCCC: due to the conceptual similarities, a comprehensive climate risk management approach can contribute to linking and operationalising international work streams of UNFCCC with regard to NDCs, NAP and the Warsaw International Mechanism for loss and damage (WIM), as well as the Sendai Framework for Disaster Risk Reduction.[228] Institutional cooperation of the WIM's Executive Committee with UNFCCC bodies, especially the Adaptation Committee and the

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[226] *Djalante et al. International Journal of Disaster Resilience in the Built Environment, 2012,* p. 166-180.

[227] *Schipper 2009,* p. 16-30.

[228] *Waltraud* 2017, p. 3.

Least Developed Countries Expert Group, should be strengthened. Strengthening comprehensive risk management in the NAP process could for example be linked in the ExCom's five-year rolling work plan that is currently being developed to NAP.[229] It would use these synergies, link stakeholders, including the private sector actors and its information and expertise on risks and risk transfer solutions, and save resources due to joint efforts.

Currently, contingency or disaster risk response plans as well as NAPs and NDC documents, are often developed and operationalised in separate in-country processes. Linking contingency or disaster risk response plans with NDCs and NAPs and taking climate risks into account enriches NDC and NAP implementation, especially regarding the management of extreme weather events and preventive risk management.[230] While solution will differ based on countries and cultural setting, institutional arrangements should be put in place to enable networks and collaboration in addressing disasters and climate risks.[231] Multi-sectoral structures and networks should be developed and strengthened in order to improve awareness on disaster risk and climate change linkage. However, this would be effectively and efficiently achieved with international climate change and disaster risk reduction regimes linkage, which will then have a spill over effect at the national level through adoption of linkage legislations and policies.

Climate change adaptation is established in a separate legal framework to disaster risk reduction regime internationally, and they also have different regime governance approaches. Although there is progress towards recognizing each of the regimes in their respective international frameworks, there is no legal framework which links climate change adaptation and disaster risk reduction. This applies to their respective international institutions also, whilst despite the common functions and roles for both climate change adaption and disaster risk reduction institutions they are not linked together. This separation bot in the legal framework and institutions may create greater challenges in future. Some of these challenges would include, high level of fragmentation for the respective international laws and institutions, duplication of roles and legislations at national level which would lead to conflicts between the

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[229] *Ibid*.

[230] *Ibid.*

[231] *Venton-Trobe* 2008, p.11-15.

regimes, misuse of resources especially funding due to duplication of roles, and many other relevant challenges.

However, with the current international climate change framework under the Paris Agreement Article 7 and 8, it provides a legal platform for future negotiations and developments which might lead to the establishment of an international linkage framework. An international linkage framework will not only provide a linkage platform for the international climate change adaptation and disaster risk reduction regimes, but also open an opportunity for the respective regime institutional linkage and coordination. The legal status for the linkage framework between climate change adaptation and disaster risk reduction would determine the respective future agreements and cooperation. It is possible to establish legally binding linkage framework for international climate change adaption and disaster risk reduction as this is not a new phenomenon in the international environmental law.

In summary, this chapter assessed the linkage in legal frameworks between climate change adaptation and disaster risk reduction. It gives a detailed development on the progress of linking climate change adaptation and disaster risk reduction in their respective regimes. The chapter further presented an analysis on how climate change adaption institutions and disaster risk reduction are linked/cooperate with each other based on their functions and roles. The next chapter gives the future prospective analysis in linking the legal frameworks and institutions between climate change adaptation and disaster risk reduction. It also gives the discussion summary and conclusion.

5 DISCUSSIONS ANALYSIS SUMMARY AND CONCLUSION

This chapter presents the prospective future analysis for legal frameworks and institutional link between international climate change adaptation and disaster risk reduction regimes, challenges facing linkage process between climate change adaptation and disasters risk reduction regimes, discussion analysis summary and conclusion.

5.1 The future prospect for international legal frameworks and institutional linkage between climate change adaptation and disaster risk reduction regimes.

Although the current climate change adaptation and disaster risk reduction regimes are not legally linked, there is some progress towards cooperation especially, at a practical level. It is a challenge for national climate change adaptation institutions and disaster risk reduction institutions to collaborate since they are established in different frameworks as reflected from the respective international regimes. In addition, climate change adaptation and disaster risk reduction originate from different international frameworks with different legal status thus making it a challenge to establish a linkage framework. However, with the current regimes under the Sendai Framework for Disaster Risk Reduction and the Paris Agreement, there are prospective opportunities to establish an international linkage framework with a legally binding status.

Strengthening international climate change adaptation and disaster risk reduction regimes would be achieved much better by establishing an international framework and institutional linkage between the regimes. A linkage framework would be the solution for institutional fragmentation problems in global environmental governance which is an issue that requires consideration given that it causes notable delays and financial expense in the functioning the respective regimes.[232] This would be achieved by developing greater synergies between the existing regimes as well as by attributing greater authority to one central agency, be it the existing climate change adaptation institutions, disaster risk reduction institutions or by establishing a new one.[233] For instance, UNISDR has been the overall agency under the disaster

[232] *Zovko* 2005, p. 4.

[233] *Ibid*, p. 3.

risk reduction regime that is mandated to coordinate various international activities for the entire disaster risk reduction regime.[234]

Though UNISDR would be regarded as a good convener, disaster risk reduction stakeholders maintain that it has not taken a strong enough role in setting the agenda and ensuring appropriate follow-up to the multi-stakeholder meetings which it has organized and facilitated in the past.[235] In addition, under climate change adaptation regime, the different types of committees or treaty bodies established during COPs meetings, normally serve as compliance control mechanisms. However, these bodies are not entrusted with the power to impose sanctions against non-compliant parties but can only recommend on how such parties can be assisted to comply or on whether to undertake investigations surrounding alleged or detected breaches.[236] Thus, it is easier to facilitate compliance to measures by bodies/institutions which are established under regimes with a legally binding framework. Legal framework and institutional linkage will facilitate multi-sectoral platforms for community participation to achieve a sustainable system of linking climate change adaptation and disaster risk reduction regimes.[237]

As a complement to International DRR efforts such as the Hyogo and now current Sendai framework advocate greater linkage with environmental, development and climate-focused treaties and institutions but with as 'soft law documents' lack binding effect.[238] Examples of efforts to modify global treaties to improve state implementation of DRR include:

- The adoption of a decision at the 12th conference of the parties of the Convention on Biological Diversity (CBD), with reference to "Biodiversity and climate change and disaster risk reduction". [239]The CBD COP decision requests the CBD executive's secretary to promote ecosystem-based approaches for disaster risk reduction given a mandate to initiate action to

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[234]*United Nations International Strategy for Disaster Reduction (UNISDR) Secretariat*. (2nd 2010). Evaluation report: Executive summary.

[235]*Ibid.*

[236]*Mrema* 2006, p. 201-228.

[237] *Sagala* 2015, p. 32.

[238] *Peel* 2016, p. 9.

[239] *BCD COP, Biodiversity and Climate Change and Disaster Risk Reduction*, Dec XII/20, UNEP/CB/COP/12/20, Oct,17,2014.

promote DRR through instruments available to CBD parties, including national biodiversity strategies and action plans.[240] The decision

- The adoption of a resolution at the 12th COP of the Ramsar Wetlands Convention on "Wetlands and Disaster Risk Reduction," which introduces DRR as one of the objectives for wetlands management.[241] The decision was arrived at with the goal of sustainable utilisation of wetland resources with minimal arm or destruction to the environment.

These efforts would be extended further to climate change adaptation regime towards establishing a legally binding framework for linkage between climate change adaptation and disaster risk reduction. The climate change regime's turn towards adaptation and climate change-induced damage which is consulted by the 2015 Paris Agreement, brings it into greater alignment with disaster risk reduction regime.[242] Although the full implication of the closer relationship between climate change adaptation and disaster risk reduction regimes and related areas such as development assistance for legal requirements, approaches, institutions, and financing arrangements remain far from clear, the current Paris Agreement would be a platform for future prospective linkage. A common objective of resilience and environmental risk management would be the future point of convergence between climate change adaptation and disaster risk reduction.[243]

The Paris Agreement Article 7 and 8 provides a better platform for future development of linking climate change adaptation and disasters risk reduction since the articles are aimed at addressing resilience and environmental risk management through cooperation with other international bodies/regimes.[244] In the next subsequent COP conferences, parties are expected to negotiate on particularly the funding mechanism for loss and damage resulting from climate change disasters. This will also boost funding efforts in the DRR regime in resource mobilization for disaster response.

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[240]*Peel* 2016, p. 9.

[241] *Wetlands and Disaster Risk Reduction. 12th meeting of Conference of Parties of convention of Wetlands, Punta del Este*, Uruguaway, 1-9 June. Res, XII/13.

[242]*Peel* 2016, p. 10.

[243] *Peters et al*…2016, p, 16.

[244]*UNFCCC,* Paris Agreement 2015, Article 7 (9)(E), 8 (4)(h).

Legal frameworks and institutional linkage between climate change adaption and disaster risk reduction regimes would be pursued under the support of sustainable development principle in Rio Declaration.[245] Sustainable development aims to maintain economic advancement and progress while protecting the long-term value of the environment; it provides a framework for the integration of environmental policies and development strategies.[246] Sustainable development can be considered part of the object and purpose of many international treaties and frameworks including the 1992 UN Convention on Biological Diversity and its 2000 Cartagena Protocol,[247] the 1992 UN Framework Convention on Climate Change and its 1997 Kyoto Protocol,[248] the 1994 UN Convention to Combat Desertification and Drought.[249] In each treaty or framework, the sustainable development objective is slightly worded differently, and operationalized differently.

For this case, ending absolute poverty is a priority for the post-2015 sustainable development goals and this requires a strong commitment to reducing disaster risks, otherwise development efforts for the poorest will be unsustainable.[250] A significant gear change is required to deliver on 'resilience' in all its forms by 2030, across the Sendai Framework, the SDGs, and the Paris Agreement. The principle of sustainable development brings all these international regimes towards a common goal.[251] It would be wise to pursue solutions that deliver resilience across the global frameworks through a linkage between the regimes. This will increase the synergies, efficiency of meeting common goals and objectives. Part of sustainable development discourse entails exploring alternative DRR subsystems as well as alternative CCA subsystems, namely finding or developing DRR or CCA subsystems that are more likely to be sustainable.[252]

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[245] *Peters et al*…2016, p, 16.

[246] Kates et al..2005, p. 8-21.

[247] *UNCBD* 1992, Convention on Biological Diversity: Preamble.

[248] *UNFCCC 1*992, Framework Convention for Climate Change: Preamble.

[249] *United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa*, adopted 17th June 1994, entered into force 26th Dec 1996. Preamble. 1954 UNTS 3; 33 ILM 1328 (1994).

[250] *Hillier-Nightingale* 201, p. 3.

[251]*Peters et al*…2016, p, 16.

[252] *Burns- Des Johansson* 2017, p. .293.

5.2 Challenges facing link of international climate change adaptation and disaster risk reduction frameworks, and their institutions.

Although there are efforts towards linking international climate change adaptation and disaster risk reduction regimes, there are several challenges towards meeting this goal. Among them includes:

5.2.1 Lack of appropriate international legal and institutional framework for linkage

Lack of a clear international linkage framework onto which climate change adaptation and disaster risk reduction would converge is a key challenge towards regime linkage[253]. Both climate change adaptation and disaster risk reduction regimes originate from different political spheres, different legal frameworks status, and political ideological differences. However, this challenge has been brought close to an end after the Paris Agreement 2015 adopted new legal framework for climate change adaptation with an option to further expound climate change adaptation and loss and damage articles in subsequent COP decisions. Article 7 and 8 of the Paris Agreement would be a founding article for establishing a linkage framework between climate change adaptation and disaster risk reduction under the Sendai framework for disaster risk reduction 2015-2030. However, realization of this would need a political goodwill from the two regimes.

5.2.2 Fragmentated knowledge, Insufficient and/or not sufficiently shared information

Often scientific data which links climate change adaptation and disaster risk reduction are not adequately monitored, and when available the information is not easily accessible to organisations or countries.[254] Also, the data collected for climate change adaptation and disaster risk reduction regimes may not be inclusive, as often informal settlements are neglected from national databases. Furthermore, due to a lack of monitoring and observation systems and especially in developing countries, historical climate records may be insufficient while other

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[253] *UN Economic and Social Council* 2013, Economic and Social Commission for Asia and the Pacific Committee on Disaster Risk Reduction: Integrating disaster risk reduction and climate change adaptation for sustainable development, p. 5.

[254] *Sagala* 2015, p. 32.

factors, such as local adaptation strategies and social information, are also often lacking. [255]This creates ambiguity in establishing the linkage between climate change adaptation and disaster risk reduction regimes due to scepticism. Despite the need to strengthen collaboration and to facilitate learning and information exchange between them, DRR and adaptation have largely remained distinct research and policy communities, with different approaches, institutions, conferences, assessment mechanisms, strategies and funding sources.[256] However, with continued research studies, there is a clear relationship being established with the aim of convergence between climate change adaptation and disaster risk reduction practice.[257]

5.2.3 Political challenges

Climate change adaption and disaster risk reduction share a common goal of resilience in development. However, a key challenge for resilience as a framing development goal is that the concept can be used to pursue a range of different goals, supporting a range of different values.[258] Resilience as a narrative has been interpreted as depoliticising the global negotiations over climate change and finance. This has been a political subject on who funds for resilience and climate change damage and losses. While disaster risk reduction shares the same goal, it is therefore a challenge to focus about funding for these regimes especially if linked together.

5.3 Discussion analysis summary and conclusion

In the discussion analysis for this research, the research objectives were met by answering the three research questions. In answering research question number one, (How is climate change adaptation and disaster risk reduction related? And why should they be linked?) the research finds out in chapter 2 that, there is a relationship between climate change adaptation and disaster risk reduction. Even though there are some differences between climate change adaptation and disaster risk reduction, there are more similarities which include common focus of minimizing risks and vulnerabilities and a common goal of achieving environmental/societal resilience. In achieving this, there are many compelling reasons on why climate change

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[255] *UN Economic and Social Council* 2013, Economic and Social Commission for Asia and the Pacific Committee on Disaster Risk Reduction: Integrating disaster risk reduction and climate change adaptation for sustainable development, p. 5.

[256] *Schipper et al*… international Journal of Disaster Resilience in the Built Environment, 2016, p. 216-228.

[257] *Birkmann- Teichman* 2010, p. 171-184.

[258] *Tanner et al*… 2017, p. 16.

adaptation and disaster risk reduction should be linked. Some of the key reasons include achieving effective and efficient risks and hazard management in the respective regimes, it will help in managing international environmental challenge of fragmentation of laws and institutions, to avoid future conflicts and duplication or of legislations relevant to respective regimes at both international and national levels, will also lead to other benefits easy access, sharing of information between climate change adaptation and disaster risk reduction institutions, facilitate collaboration among respective regime institutions, and will also be a link point of achieving sustainable developmental goals.

In the discussion analysis in chapter 3, the research also answered the question no 2. (What are the legal frameworks for climate change adaptation and disaster risk reduction regimes?). Through research analysis, climate change adaptation is currently based on the Paris Agreement framework, under the treaty framework of UNFCCC.[259] Article 7 of the Paris Agreement gives the legal text framework for climate change adaptation regime. The framework is legally binding to member parties under climate change adaptation regime. The Paris Agreement creates a global goal on adaptation that had been absent from previous UNFCCC agreements, aiming to enhance 'adaptive capacity, strengthening resilience and reducing vulnerability to climate change' in Article 7.[260]

The Agreement determines that countries should put more emphasis on adaptation planning, and based on this planning Parties should strengthen their cooperation, including through the transfer of funds Article. 7.[261] The adequacy of action and support will be reviewed as part of the global stocktake. Loss and damage, which has been historically treated as a component of adaptation, it now has its own legal text under the Paris Agreement in Article 8 .[262] The loss and damage agenda also emphasises the need for taking responsive measures and highlights areas of cooperation and facilitation to enhance understanding, action and support which includes early warning systems, slow onset events, emergency preparedness, resilience of communities and livelihood, ecosystems among other areas related to risk management. While

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[259] United Nations Framework Convention for Climate Change (2015). *Paris Agreement*. Paris: United Nations, Pg.1-27.

[260] United Nations Framework Convention for Climate Change (2015). *Paris Agreement*. Art 7.

[261] Ibid 249.

[262] UNFCCC 2017, *Paris Agreement*. Art 8.

the international disaster risk reduction regime is based on a voluntary, non-binding (soft law) legal framework under the UN Sendai Framework for Disaster Risk Reduction.[263] This framework is a time-bound, between 2015-2030 with disaster risk reduction priorities and guiding principle measures. The SFDRR is a successor to the Hyogo Framework for Disaster Risk Reduction while was also created under the same platform by the UN General Assembly resolution 2005-2015. Disaster risk reduction regime, however, is not well developed unlike climate change adaptation regime.

Lastly, research question number 3 "To what extent are the international regimes for climate change adaptation and disaster risk reduction linked? What are the opportunities for their further linkage' was answered in chapter 4 and 5. Despite the recognition of both climate change adaptation and disaster risk reduction in their respective regimes, there is a clear gap of lack of a legal framework to link climate change adaptation and disaster risk reduction framework and their respective institutions. However, the progress so far in climate change adaptation and disaster risk reduction regimes provides a platform for future opportunities to establish a legal framework to link the regimes and their respective institutions. This is especially with the current climate change adaptation international framework of the Paris Agreement, Under Article 7 on strengthening the adaptation measures through cooperation and Article 8 with the aim of resilience. Future linkage of climate change adaptation and disaster risk reduction frameworks would also open opportunities for their respective regime institutions for collaborative synergies.

[263] *United Nations General Assembly* 2015, The Sendai Framework for Disaster Risk Reduction (2015-2030), UNISDR. Resolution (Dec. 69/283).

5.4 Conclusion

From the research analysis, international climate change adaptation and disaster risk reduction regimes exists separately despite many practical similarities. The two regimes are anchored in different international frameworks, with different legal nature, and different institutions. There are also a several compelling reasons on why the two regimes should be linked. However, even though there is progress towards linking climate change adaptation and disaster risk reduction regimes, there is no clear international linkage framework between the two regimes. In addition, international climate change adaptation and disaster risk reduction institutions operate separately despite having common functions and roles in their respective regimes. Nevertheless, the current international framework on climate change and disaster risk reduction offer an opportunity for future respective regime linkage. An international linkage framework would be one of the best option in linking climate change adaptation with disaster risk reduction as it is not a new phenomenon under the international environmental law. The common objectives of vulnerability and risk management which aim at resilience, should form the basis for climate change adaptation and disaster risk reduction linkage. Article 7 and 8 of the Paris Agreement provides an opportunity for future engagement in establishing a legal framework to link climate change adaptation and disaster risk reduction regimes and their respective institutional collaboration/linkage.