

UNIVERSITÀ DEGLI STUDI DI PADOVA

DEPARTMENT OF POLITICAL SCIENCE, LAW,
AND INTERNATIONAL STUDIES

**Master's Degree in
Human Rights and Multi-level Governance**



CLIMATE CHANGE ADAPTATION AND
DISASTER RISK REDUCTION FOR
SUSTAINABLE DEVELOPMENT:
THE CASE OF KARAMOJA

Supervisor: Prof. ALBERTO LANZAVECCHIA

Candidate: SATI ELİFCAN ÖZBEK

Matriculation No. 1148290

A.Y. 2017/2018

ACKNOWLEDGEMENTS

I would like to first pay my regards and show my deepest gratitude to my thesis supervisor, Prof. Alberto Lanzavecchia at the University of Padova, who put faith in me and this research from the beginning and gave me the full support and opportunity to pursue part of this research in the field, in Karamoja, Uganda. He steered me in the right direction when I ran into a trouble spot or had a question, while at the same consistently allowing me to own this research.

I am grateful for my three-week journey in Karamoja that broadened my horizons both academically and personally, acquainting me with the ability to see anything through different lenses. In this regard, I would like to thank ECO Uganda for opening their doors for me in Uganda, and ECO Nabilatuk Field Office staff Justin Bob Kocho and Peace Achok for hosting me in Karamoja and contributing to my research with their expertise and guidance.

Personally, my special heartfelt thanks go to my beloved boyfriend, Mirko, for always being there for me with his constant support, tolerance and warm encouragement in this process.

Finally, I must express my profound gratitude to my parents, Fatma and Veli Özbek, for providing me with unfailing support and continuous encouragement throughout my life to follow my dreams. This accomplishment would not have been possible without their unconditional love and support.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES.....	1
LIST OF ACRONYMS	2
INTRODUCTION.....	3
1. CLIMATE CHANGE, ADAPTATION AND DISASTER RISK REDUCTION.....	7
1.1 Global Climate System and Climate Change: Scientific Basis and Evidence.....	7
1.2 Global Political Response to Climate Change.....	13
1.3 Climate Resilience: Adaptation as a Pathway.....	17
1.4 Disaster Risk and Disaster Risk Reduction.....	20
2. CLIMATE CHANGE, HUMAN RIGHTS AND SUSTAINABLE DEVELOPMENT.....	28
2.1 Human Rights and Climate Change.....	28
2.2 The Human Rights Implications of Climate Change.....	31
2.2.1 Right to Life.....	32
2.2.2 Right to Adequate Standard of Living.....	33
2.2.2.1 Right to Food.....	35
2.2.2.2 Right to Water and Sanitation.....	36
2.2.3 Right to Health.....	39
2.3 Sustainable Development and Climate Change.....	42
2.3.1. The Sustainable Development Goals (SDGs).....	45
2.3.2 The Implications of Climate Change on the 2030 Agenda.....	49
2.4 Climate Change, Disaster Risk, Sustainable Development and Human Rights: Coordination and Engagement.....	52

3. THE CASE STUDY: CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION IN KARAMOJA.....	58
3.1 Country Background: Uganda.....	60
3.2 Uganda: Climate Change, Disaster Risk and Sustainable Development Agendas.....	62
3.3 Regional Background: Karamoja.....	67
3.4 ECO and Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Karamoja.....	73
3.4.1 Interventions.....	75
3.4.2 Napayan.....	80
3.4.3 Nathinyonoit (A).....	82
3.4.4 Namidikao.....	85
3.5 Impact Assessment of ECO’s Project Interventions in Three Villages.....	90
3.5.1 Findings of the Impact Assessment of ECO’s Project Interventions in Three Villages.....	92
3.5.2 SDGs and Human Rights Relevance.....	97
3.6 Prospect for Action: Graduation and Exit Strategies.....	105
CONCLUSION.....	111
BIBLIOGRAPHY.....	115
SITOGRAPHY.....	125

LIST OF FIGURES AND TABLES

FIGURES

Figure 1. Globally Averaged Greenhouse Gas Concentrations.....	9
Figure 2. Global Temperature Anomalies over Land and over Ocean.....	9
Figure 3. Number of Climate-related Disasters around the World 1980-2011.....	20
Figure 4. The Interacting Core Concepts of Climate Change Adaptation and Disaster Risk.....	21
Figure 5. Disaster Risk Equation.....	22
Figure 6. Venn Diagram of Sustainability.....	43
Figure 7. The 17 Sustainable Development Goals.....	46
Figure 8. Integrating Climate Change Adaptation with the SDGs and DRR.....	53
Figure 9. Comprehensive Map of Uganda and Karamoja (by districts).....	68
Figure 10. A kitchen garden in Nathinyonoit (A).....	84
Figure 11. A debt pay-off between the VSLA members at the Climate Information Center in Namidikao.....	87
Figure 12. Two beekeepers with their bee hives in Namidikao.....	88

TABLES

Table 1. Focus Group Discussion Facilitating Questions.....	59
Table 2. Environmental, Social and Economic Impact Categories and Indicators.....	91
Table 3. Recap of Impacts of Interventions in Napayan Village.....	93
Table 4. Recap of Impacts of Interventions in Nathinyonoit (A) Village.....	94
Table 5. Recap of Impacts of Interventions in Namidikao Village.....	96
Table 6. Attribution of ECO Interventions and Impacts with the nexus of SDGs.....	101
Table 7. Attribution of ECO Interventions and Impacts with the nexus of Human Rights.....	104

LIST OF ACRONYMS

AR	Assessment Report
CBDR	Common but Differentiated Responsibilities
CESCR	Committee on Economic, Social and Cultural Rights
CPESDRR	Climate Proof Eco-Smart Disaster Risk Reduction
COP	Conference of the Parties
DRR	Disaster Risk Reduction
EAC	East African Community
ECO	Ecological Christian Organization
GHG	Greenhouse Gas
HFA	Hyogo Framework for Action
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
MDGs	Millennium Development Goals
NGO	Non Governmental Organization
NAPA	National Adaptation Programme of Action
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
SREX	Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VSLA	Village Savings and Loan Association
WHO	World Health Organization

INTRODUCTION

Across our planet, the climatic characteristics and patterns are rapidly changing at an unprecedented scale, substantially due to the human activities that have led to adverse consequences on the Earth's climate system. Industrialization and urbanization, for instance, have exacerbated deforestation, environmental degradation, environmental and air pollution. These human interventions in the climate system make climate change more abrupt and intense, therefore the recent experience of climate change is considered anthropogenic. Most significantly, the technical advancements in energy-intensive mechanization and industrialization in the modern era have necessitated a constant energy production-consumption loop for the functioning of the industrial economy, and the process of energy generation through the combustion of fossil fuels results in the emission of carbon dioxide (CO₂) that is the most prevalent human-driven greenhouse gas in the Earth's atmosphere. The excessive greenhouse gas emissions trap the heat in the atmosphere through an enhanced greenhouse effect, and the planet warms up. Thus, climate change primarily manifests itself through the spearheading symptom of global warming that drives the other ensuing symptoms, such as ocean acidification, sea level rise, loss of ice sheets, retreat of glaciers and snow covers, climate-driven extremes such as droughts, floods and tropical cyclones that have also intensified following the warming of the air, land and oceans. All these symptoms in the climate system have enormous immediate impacts on human systems as well, including on settlements, livelihoods, public health and safety, economy and society through heavy losses and burdens that are borne by populations, which interferes with the socio-economic development processes. The adverse impacts, risks and challenges posed by climate change are harsh reality for many communities around the world, even though the type, severity, and loss experienced are different. Thus, the global society envisaged the need for a collective yet customized action against climate change according to the specific geographical, social, economic, educational, and infrastructural conditions through establishing and strengthening the ability of systems and communities to resist, absorb, accommodate, adapt to, transform and recover from the hazardous effects of climate change in a timely and efficient manner, in short *climate resilience*. For this end, the climate change governance regime today incorporates mitigation, adaptation, disaster risk reduction and sustainable development paradigms, acknowledging that substantial

climate resilience depends on the blend of these channels. The concept of climate resilience holds specific importance in the poorest and vulnerable contexts where high exposure to adverse impacts and lack of capacity exist, which requires immediate adaptation and disaster response strategies before a climate hazard evolves into a disaster and severely interferes with the normal functioning of a community and of development path. In particularly vulnerable contexts as such, the adverse impacts of climate change pose serious threats -unless appropriate adaptation and disaster risk measures are taken- on human lives, agricultural production and food security, rural livelihoods, water availability and accessibility, community health and sanitation, and general living standards; which mirrors several internationally recognized human right standards in content. Given the fact that human rights is an historic indispensable cornerstone of global governance regimes in all spheres and the practical relevance of human rights discourse to the adverse socio-economic impacts of climate change on the path for sustainable development; human rights have recently become one of the normative frameworks that have been employed to think about climate change governance and sustainable development globally. In this regard, today, the global climate change governance regime and the post-2015 sustainability agenda fairly base their origins on and interrelate to the premises of the international human rights discourse, which empowers and legitimizes their positions and assertions. The overall comprehensive and guiding global post-2015 agenda is composed of three 2015-born instruments in synergy representing the domains of climate change, disaster risk and sustainable development respectively -Paris Agreement, Sendai Framework for Disaster Risk Reduction and the Agenda 2030 comprising 17 Sustainable Development Goals (SDGs) - that create an integral scale for the evaluation and accomplishment of climate resilience and sustainable development across the globe through their distinctive interpretations and practices on the common purpose of resilience.

In this light, the present research aims at translating the theoretical premises of global discourses of climate change, disaster risk, human rights and sustainable development into a local level practice case through the particularly vulnerable context of the region of Karamoja in Uganda in pursuit of sustainable development and community resilience against the challenges and risks posed by climate change.

In the first part of this research, we address the scientific basis and evidence of climate change with numbers and graphics that are compiled from various reliable scientific data sources; the global political cooperation mechanisms that are designed to act upon the mitigation of climate change; the climate resilience and adaptation as a pathway in order to deal with the impacts and challenges posed by climate change and its symptoms; and lastly the disaster risk reduction framework that is the cornerstone for physical, economic, social and environmental resilience building in the wake of increasing intensity and frequency of climate and weather extremes that threaten the normal functioning of human systems.

The second part of this research encapsulates the trio of climate change, human rights and sustainable development. In doing so, we shortly cover the theoretical relationship between the human rights and climate change discourses, the practical relevance of human rights and climate change through the implications of climate change on the enjoyment of the five selected human rights: right to life, right to adequate standard of living, right to food, right to water and sanitation and right to health. Moreover, we address the paradigm of sustainable development, the sustainable development goals (SDGs) framework, and the impacts of climate change on the achievement of six selected SDGs: SDG1 (no poverty), SDG2 (zero hunger), SDG3 (good health and well-being), SDG6 (water and sanitation), SDG13 (climate action) and SDG15 (life on land). At this juncture, the methodology employed for the selection of these specific human rights and SDGs results from the thematic focus nexus developed for the scope of this work, which is comprised of poverty, food, health, water, and climate. In this part, we lastly gather the four paradigms examined throughout this thesis -climate change, human rights, disaster risk and sustainable development- under the roof of the concept of resilience and elaborate on their coordination and engagement in the post-2015 global sustainability agenda showing how they are inextricably interdependent on one another.

The last part of this research is devoted to the case study that centers upon the region of Karamoja in Uganda, in order to illustrate how climate change adaptation, disaster risk reduction and sustainable development paradigms interplay in a particularly vulnerable local context through multi-level governance model that incorporates international regional, national and local level mechanisms in pursuit of community resilience against

climate change and disasters. While doing so, we first cover the country background of Uganda, pointing out the particular socio-economic vulnerabilities and climate change impacts in the country; and Uganda's climate change, disaster risk and sustainable development agendas through the interplay between the country's international and regional commitments and Ugandan national policy instruments, focusing on the national level. After that, we direct the attention to a regional level analysis within Uganda through the region of Karamoja, addressing the geographic, climatic and socio-economic characteristics together with the symptoms of climate change prevalent in the region. Thereupon, the local and community level analysis are carried out through the field research data that was collected between 25th February 2018 and 18th March 2018 in Nabilatuk and Lolachat sub-counties of Nakapiripirit District in Karamoja under the supervision of Ecological Christian Organization (ECO) Nabilatuk Field Office. In this regard, the ECO Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Nakapiripirit District with a focus on three villages -Napayan, Nathinyonoit (A), and Namidikao- constitutes the focal point with a community-level analysis within the case study of this thesis. In the data collection process, we employed participatory ethnographic data collection methods of participant observation, interview, focus group discussions, and audio-visual tools. This community-level analysis commences with the examination of ECO's project interventions in the defined area and continues with the reflections on the interventions in the particular contexts of each village. In order to evaluate the contribution of the project to community resilience in the area, we conduct an impact assessment and display the findings separately for each village. Afterwards, we connect the contents and scopes of ECO interventions coupled with the findings from the impact assessment to the abovementioned nexus of SDGs and human rights standards that are elaborated in this thesis. Lastly, we take a prospective stand and look beyond the current phases of the ECO CPESDRR project life cycle through the evaluation of the exit strategies in a going-forward basis.

1. CLIMATE CHANGE, ADAPTATION AND DISASTER RISK REDUCTION

1.1 Global Climate System and Climate Change: Scientific Basis and Evidence

*Since the beginning of Earth's history, climate has varied on all timescales.*¹The climate variations or temperature anomalies for million years have occurred as a result of internal and external dynamics of the Earth and cosmos such as earth orbital forcing, solar irradiance changes, and tectonics; in other words, of natural causes.²

Especially over the last century, the climate is rapidly changing across our planet at an unprecedented scale, substantially due to the human activities that have led to adverse consequences on the Earth's climate system: industrialization and urbanization, for instance, have exacerbated deforestation, environmental degradation, environmental and air pollution. The human intervention processes in the climate system makes the change more abrupt and intense, therefore the recent experience of climate change is considered anthropogenic.

As from the simple steam engines of the Industrial Revolution in the 18th century to the massive industrial complexes of the 21st century, the technical advancements in energy-intensive mechanization and industrialization in the modern era have necessitated a constant energy production-consumption loop for the functioning of the industrial economy. In this regard, fossil fuels have been the primary source of energy with the utilization of coal, oil, and natural gas respectively. The process of energy generation through the combustion of fossil fuels results in the emission of carbon dioxide (CO₂), which is the most prevalent human-driven greenhouse gas (GHG)³ in the Earth's atmosphere. The other two prevalent anthropogenic GHGs, CH₄ and N₂O emissions largely emanate from the activities on agriculture, forestry and other land use (AFOLU). To illustrate, CO₂ emissions from fossil fuel combustion and industrial processes contributed about 78% of the total GHG emission increase from 1970 to 2010. Moreover, as of 2010, CO₂ remains as the major anthropogenic GHG accounting for

¹ Goosse, H. (2015). Chapter 5 Brief history of climate: causes and mechanisms. *Climate System Dynamics and Modelling*. p.110

² For more detailed information see Goose (2015) Chapter 5.

³ Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary natural greenhouse gases in the Earth's atmosphere, whilst fluorinated gases (F-gases) are a family of GHGs that are purely human-made.

76% of total anthropogenic GHG emissions in 2010, whilst 16% come from methane (CH₄), 6.2% from nitrous oxide (N₂O), and 2.0% from F-gases.⁴

The excessive human-caused emission of CO₂, CH₄ and N₂O has changed the protected balance of atmospheric gas composition, disturbing the natural greenhouse effect dynamics: The Sun powers the Earth with solar irradiance and the part of the solar energy is absorbed by the land and ocean, while the rest is emitted toward the outer space. The part of this emitted infrared thermal radiation is re-absorbed and re-emitted by the greenhouse gases that are heat-trapping in the atmosphere.⁵ The dramatic human-induced increase in the concentration of the GHGs in the atmosphere enhances the absorption of the infrared thermal radiation, which is called “enhanced greenhouse effect.”⁶ This process leads to the over-heating of the Earth surface and air, that is to say, “global warming”, being only one of the key indicators of anthropogenic climate change. Consequently, there is a strong causal link between the concentration of GHGs and temperature anomalies on the globe, which has been accepted by the global scientific community with high confidence. The evaluation of the successive two graphs on the levels of GHG emissions and global temperature index on land and ocean clearly presents this causal relationship.

Figure 1 shows the average levels of Greenhouse Gas concentration around the globe from 1750 to 2010 taking into account CO₂, CH₄ and N₂O. The graph illustrates that the emissions of these GHGs have started to increase exponentially as of 1950s, and sharply continues to rise in 2000s. According to the latest measurements by National Oceanic and Atmospheric Administration (NOAA) on March 2018, the current level of global CO₂ emissions is 408 ppm⁷, which had been 390 ppm in 2010 as illustrated on the graph below and on NOAA measures in 2010.

⁴ Edenhofer, O.et.al. (Eds.). (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III (WGIII) to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (AR5), Summary for Policymakers Chapter, p.6

⁵ Solomon, S. et al. (Eds.) (2007). Climate Change 2007:Physical Science Basis. Contribution of Working Group I (WGI) to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (AR4) , Technical Summary Chapter p.93

⁶ Houghton, J.T.et.al. (Eds.). (2001). Climate Change 2001: Physical Science Basis. Contribution of WGI to the Third Assessment Report of the Intergovernmental Panel on Climate Change (TAR), Chapter 1 on the Climate System, p.93

⁷ For more information and timescales on CO₂ emissions, see NASA website.

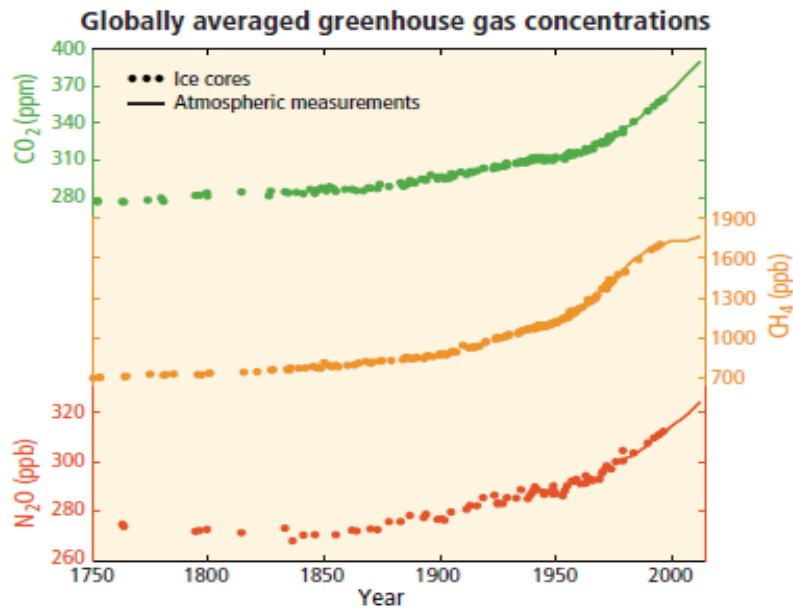


Figure 1. Globally Averaged Greenhouse Gas Concentrations⁸

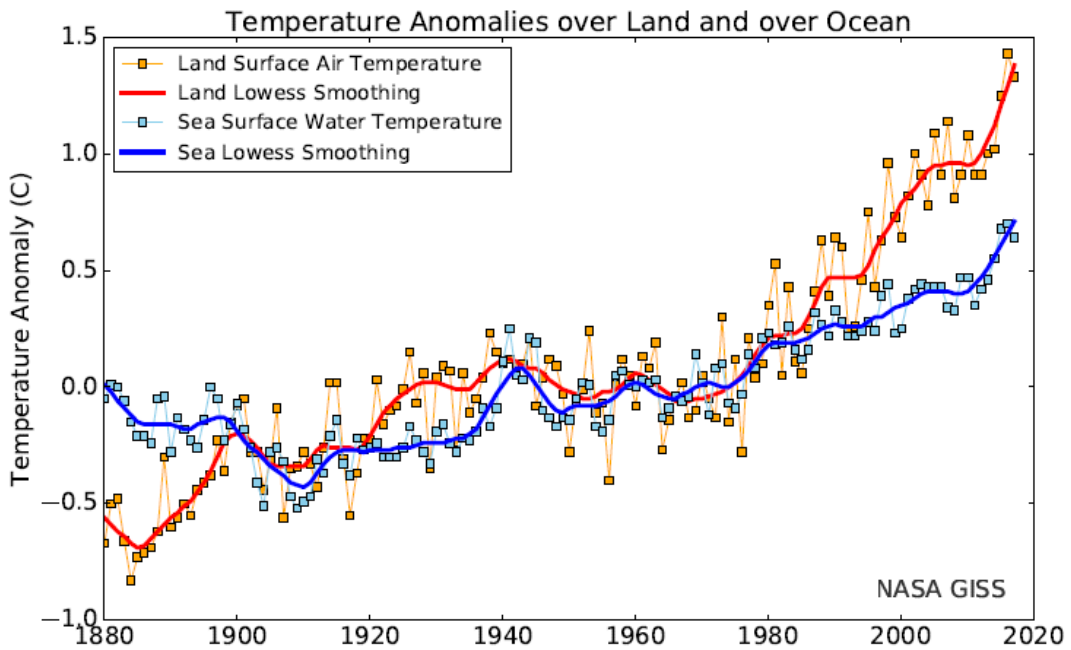


Figure 2. Global Temperature Anomalies over Land and over Ocean⁹

⁸ The figure is retrieved from IPCC AR5 Synthesis Report Summary for Policymakers, p.3

⁹ The figure is retrieved from the NASAGISS Database. Available at

<https://data.giss.nasa.gov/gistemp/graphs/>

Figure 2 depicts the global temperature anomalies on land and ocean separately, from 1880 to 2017, based on annual averages. The graph demonstrates that after 1970s, sporadically-fluctuating but ever-growing trends for both land and ocean temperatures supersede the casual ups and downs of the period 1880-1970. When we focus on the 2000s, we see yet another sharply increasing trend starting from 2011. As the latest annual mean available, in 2017, the temperature anomalies for land and for ocean have been recorded as 1.33 °C and 0.64 °C respectively.¹⁰ Taking into account these two graphs, we can confidently assert that recent abrupt temperature anomalies are in direct proportion to anthropogenic GHG emissions of previous decades.

As mentioned before, global warming of Earth's land and ocean surface is simply one of the symptoms of the much larger problem¹¹ of global climate change. Climate change not only incorporates global warming but also the side effects of warming that are observed on all the components of the climate system. The Earth's climate system is an interactive and complex system that consists of the atmosphere, the hydrosphere, the cryosphere, the land surface and the biosphere. This system is influenced by various natural or anthropogenic external forcing mechanisms. Since "*many physical, chemical and biological interaction processes occur among the various components of the climate system*"¹², the variation in the dynamics of one component gradually alters the dynamics of the others in the system. Due to the fact that the atmosphere is the most unstable and rapidly changing component in the climate system, the atmospheric composition variations and global warming provoke corresponding changes on the other components. We will now briefly examine these changes.

To begin with, hydrosphere is the component of the climate system that is composed of all water cover in fluid form on the Earth's surface, including seas, oceans, lakes, and rivers. The adverse effects of GHG concentrations in the atmosphere and global warming on hydrosphere reveal themselves firstly as the temperature and heat content variations on the upper and deep levels of oceans and seas, that is to say, the oceans and seas are warming. The increased level of CO₂ concentrations in the atmosphere leads to

¹⁰ The data is retrieved from the NASAGISS Database.

¹¹ Kennedy, C., Lindsey, R. (2015, June 17). What's the difference between global warming and climate change, n.p.

¹² IPCC TAR Contribution of WGI Chapter 1 on the Climate System , p.89

a correspondent increased retention of CO₂ on the water mantle, causing the warming. According to NASA sea-level observations, the average change on sea rise level is 3.2 mm per year, from 1993 to 2017.¹³ The heat content and temperature anomalies of the water mantle disturb the balance of salinity and freshwater levels of oceans and seas as a result of extra evaporation of water caused by the warming; therefore the salinity increases and fresh water level decreases in the composition of seas and oceans unless rainfall offsets the evaporation. Moreover, the warming of seawater contributes to sea level rise due to the volumetric expansion of water as the temperature rises; which specifically threatens the low-lying settlements. Furthermore, the increased CO₂ retention upsets the biogeochemical balance of oceans and seas by changing the carbon and oxygen concentrations as well as the pH level of water. For instance, oxygen concentrations have declined in the open ocean thermocline since 1960s¹⁴ because warmer waters hold less oxygen, while the carbon inventory of the oceans has increased since 1990s. The excessive retention of CO₂ results in gradual acidification of oceans, i.e., decrease in the pH level of waters. To illustrate, “*the pH of surface seawater has decreased by 0.1 since the beginning of the industrial era.*”¹⁵ All in all, temperature rise, variances in the carbon and oxygen inventories and ocean acidification unbalance the natural harmony and order below water, they consequently derange the marine habitat such as coral reefs, as well as the interaction of hydrosphere with the other components of the climate system.

Secondly, cryosphere is the component of the climate system that is composed of all water cover in solid form on the Earth’s surface, such as sea ice, glaciers, ice-sheets and snow cover. The adverse effects of GHG concentrations in the atmosphere and global warming on cryosphere appear in the form of rapid decrease¹⁶ in the sea ice extent and thickness in the Arctic and the opposite effect in Antarctica but at a lower rate¹⁷, glacier shrinkage, ice-sheet loss, and snow cover decrease. Cumulative ice loss from all glaciers and ice sheets of Greenland and Antarctica significantly contributes to the rising sea

¹³ See more on <https://climate.nasa.gov/vital-signs/sea-level/>

¹⁴ See more on IPCC AR5 Contribution of WGI Chapter 3 on Oceans.

¹⁵ IPCC AR5 Contribution of WGI Chapter 3 on Oceans, p.259

¹⁶ IPCC AR5 Contribution of WGI Chapter 4 on Cryosphere: Between 1979 and 2012, Arctic sea ice extent declined at a rate of between 3.5 and 4.1% per decade, with larger losses in summer and autumn.

¹⁷ IPCC AR5 Contribution of WGI Chapter 4 on Cryosphere: Between 1979 and 2012, Antarctic sea ice extent increased at a rate of between 1.2 and 1.8% per decade.

levels as a result of the added melting water to hydrosphere with an annual mean of 1.0 to 1.4 mm (sea level equivalent) for the period 1993-2009.¹⁸ The latest data available, thanks to NASA GRACE Satellites, indicate that the ice mass loss from the ice sheets of Greenland and Antarctica has accelerated since 2009.¹⁹ All the observed and ongoing changes on the different components of the cryosphere not only damage the polar ecologic systems and biotopes; but also interfere in the complex interactions throughout the climate system.

Lastly, when we come to the land surface and biosphere, whilst acknowledging that the biodiversity losses, ecosystem destructions and environmental degradation are also cumulative consequences of adverse climate change effects and anthropogenic activity on Earth, we will rather concentrate on the extreme climate events that have physical, social, and economic impacts on human lives and habitats. Global warming and climate change boost the likelihood and magnitude of certain extreme climate events, such as temperature extremes, droughts, heat waves, floods, precipitation, and tropical storms or cyclones. To begin with, there are global and regional large-scale trends of increase in the number of warm days and nights and decrease in the cold ones, which is found to be consistent with the warming.²⁰ At this juncture, since the beginning of 20th century, the maximum and minimum temperature thresholds for summer and winter periods are rising jointly: whilst the maximum threshold ascends at a lower rate, the minimum temperatures rise at a faster rate; meaning that the winters are becoming warmer in many parts of the world though with few local and regional exceptions of cooling.²¹ Therefore, the extreme events that are attributed to an aspect of temperature provide more reliable and precise data for the correlation between the extremes and the anthropogenic climate change. Apart from causing temperature anomalies, *“warming also is expected to lead to more evaporation that may exacerbate droughts and increased atmospheric moisture that can increase the frequency of heavy rainfall...”*²² and the heavy rainfall may lead to floods in the contexts of infrastructural vulnerability. In this regard, for the frequency and intensity droughts, precipitation and floods, there

¹⁸ IPCC AR5 Contribution of WG1 Chapter 4 on Cryosphere, p.367

¹⁹ See more on <https://climate.nasa.gov/vital-signs/ice-sheets/>

²⁰ IPCC AR5 Contribution of WG1 Chapter 2 on Atmosphere and Surface, p.162

²¹ Ibid., p.212

²² National Academies of Sciences, Engineering and Medicine. (2016). *Attribution of Extreme Weather Events in the Context of Climate Change*, p.1

are regional and local trends²³ of increase or decrease rather than a global disposition; because of the variability of climate and climate system mechanisms around the world. On the cyclone activities, while the annual number of tropical storms and hurricanes has altered little, the intensity and frequency of strongest tropical cyclones have increased over the past 100 years.²⁴ However, there is no robust evidence for a change in the intensity and frequency of the extra-tropical cyclone activities over the same period.

After this scientific introduction and illustration of the symptoms of climate change, we will now address how the global political society reacts to the adverse impacts, risks and challenges posed by the climate change.

1.2 Global Political Response to Climate Change

The above-mentioned changes in the climate system have enormous immediate impacts on human systems on Earth. Rising sea levels, extreme climate events such as droughts, hurricanes and floods, and climate variability disturb frequently and noticeably wide range of areas such as agriculture, husbandry and other livelihoods, health, water and sanitation in many parts of the world. To illustrate briefly, ascending droughts and climate variability today – driven by global warming and climate change- in arid and semi-arid regions of developing sub-Saharan African countries endanger the provision of agricultural and pastoral products as a result of crop failures and loss of cattle and ovine. Bearing in mind the fact that the agriculture and husbandry are rain-fed and nature-reliant in those countries, crop failures and livestock losses occur in those regions in consequence of lack of rainfall, or irregular and untimely rainfalls, dryness, evaporation of existing outdoor water resources, lack of infrastructure to utilize underground water resources and other irrigation systems. Since agriculture and husbandry hold utmost importance for household consumption and national economy in those countries, the adverse impacts on these sectors together with lack of available water threaten food and water security for the population and raise risks for under-nutrition, malnutrition or even hunger crisis, therefore impair general health and wellbeing, and damage the economic activities and livelihoods. Since the heavy losses

²³ For the specific impacts on different regions and continents, see IPCC AR5 Contribution of WG1 Chapter 2 on Atmosphere and Surface, p.211

²⁴ IPCC AR5 Contribution of WG1 Chapter 2 on Atmosphere and Surface, p. 217

and burdens are borne by states and populations under their jurisdictions, the state governments first individually and then collectively started to respond to the climate change and its effects.

In 1970s, thanks to the advancement of space and satellite technology, the scientific knowledge and evidence on atmospheric and climatic variations such as air and environmental pollution, global warming, and ozone layer depletion have come to the fore, and the states started to collectively engage with the environmental issues. At this point, in 1972, under the United Nations (UN) umbrella, the international community gathered in Stockholm for the UN Conference on Human Environment to discuss, the international environmental action plans, control of pollutants, and the preservation and enhancement of the human environment.²⁵ The outcomes of the Conference were the foundation of United Nations Environment Programme (UNEP) and the adoption of a declaration. The Declaration raised the issue of climate change for the first time in the international political sphere; however, “*not as a stand-alone priority issue, but a subset of other major global environmental problems.*”²⁶ Starting from the 1980s, as the human sufferings and economic losses soared up due to the hazards driven and escalated by global warming and climate change, and concurrently stronger scientific evidence and knowledge were accumulated for the cause of climate change; the states promptly and adequately felt the urge to react and treat climate change as a separate priority issue. In 1988, Intergovernmental Panel on Climate Change (IPCC) – the leading international body for the assessment of climate change- was established in order to “*prepare comprehensive review and recommendations with respect to the state of knowledge of the science of climate change; social and economic impact of climate change, possible response strategies and elements for inclusion in a possible future international convention on climate.*”²⁷ IPCC in this regard has prepared 5 assessment reports (AR) and 11 special reports (SR) since 1988.

²⁵ Jackson, P. (2007). From Stockholm to Kyoto: Brief history of climate change. In *the Magazine of the United Nations UN Chronicle*, 44 (2).

²⁶ Hall, N. (2016). The institutionalization of climate change in global politics. In E. Atkins and G. Sosa-Nonez (Eds.), *Environment, Climate Change and International Relations*, p.63

²⁷Compiled from IPCC website, History section

After the intergovernmental joint action for the science and impacts of climate change, the first concrete political action by the international community was the adoption of UN Framework Convention on Climate Change (UNFCCC) in 1992 at the Earth Summit in Rio de Janeiro, Brazil that entered into force in 1994, and since then UNFCCC as an institution has been the cornerstone of the global climate change regime. The Framework Convention aimed at stabilizing the levels of greenhouse gas concentrations in the atmosphere at a point that would not interfere with the climate system perilously,²⁸ meaning mitigation, and briefly touched upon the issues of adaptation and sustainable development. The Conference of the Parties (COP)²⁹ sessions are annually held since 1995 up until today in order to review the implementation of the Convention, to assess the progress in coping with climate change, and to take further decisions and adopt other legal instruments for the facilitation of achieving the ultimate goal of the Convention.³⁰ In fact, several COP sessions have been remarkable for the emergence of new legal documents governing different spheres of multilateral action against climate change. In 1997, COP3 in Kyoto, Japan culminated in the adoption of the Kyoto Protocol that entered into force in 2005, which “*commits its parties by setting internationally binding emission reduction targets.*”³¹ Within the commitment process, the Protocol recognizes and activates the principle of “common but differentiated responsibilities”³² (CBDR), considering that “*developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations.*”³³ The first commitment period 2008-2012 targeted to reduce the GHG emissions to an average level of 5% compared to 1990 levels. At this juncture, the Protocol lists a number of developed countries that are bounded by the achievement of the targets of the Protocol, which are known as “Annex B”³⁴ countries. The transitioning economies and developing countries are not bounded by the targets, and the reduction targets for the Annex B countries differ from country to country.

²⁸ For more detailed information, see Article 2 of UNFCCC.

²⁹ The COP is the supreme decision-making body of the UNFCCC.

³⁰ UNFCCC. (n.d.). Conference of the Parties (COP)., paras 1-3

³¹ UNFCCC.(n.d.). What is the Kyoto Protocol., para1

³² CBDR is a principle of international environmental and climate change law establishing that all states are responsible for addressing global environmental destruction yet not equally responsible.

³³ Ibid., para 3

³⁴ For the full list of Annex B countries, please refer to the Kyoto Protocol.

Among Annex B countries, whilst some countries or groupings such as the European Union achieved the targets set for the first commitment period³⁵, some others like Canada not only failed to meet the targets but also increased the GHG emissions.³⁶ Along with the mitigation efforts of Kyoto Protocol, COP16 in Cancun, Mexico in 2010 was concluded with the Cancun Agreements, the most significant of which is the Cancun Adaptation Framework that emphasized the role of adaptation as equally important as mitigation. The Cancun Framework highlighted the core characteristics that adaptation plans or strategies should have for successful results: participatory, gender-sensitive, country-driven and localized, taking into consideration vulnerable groups, communities and ecosystems, integrating natural resources and disaster risk management into adaptation, and guided by the best available science accompanied by traditional and indigenous knowledge.³⁷ Soon after the incorporation of adaptation into international political agenda on climate change, the international community returned to the mitigation arrangements. The second commitment period to the Kyoto Protocol (2013-2020) together with the updated targets were agreed upon at COP18 in Doha, Qatar with Doha Amendments in 2012: the Parties committed to reduce GHG emissions by an average of 18 percent below 1990 levels between 2013-2020; however, the Amendment has not entered into force yet because of the insufficient number of ratifications by the parties to the Protocol. It is worthy of consideration that the top CO₂ emitter at the time, the United States, has never agreed to the Protocol, that the potential great emitters like China and India have not been bounded by the targets of the Protocol since they are not listed in the Annex B, and that the Doha Amendment has not yet reached the ratification threshold for entry into force. These circumstances have been regarded as vulnerabilities and deficiencies for the future of the Kyoto Protocol and mitigation measures.

The latest centerpiece of the global climate change regime is the Paris Agreement that was adopted in 2015 at COP21 in Paris, France and entered into force in 2016 after the

³⁵ European Commission. (n.d.). Kyoto 1st commitment period (2008-12), para 3

³⁶ UNFCCC. (2011). Report of the individual review of the annual submission of Canada submitted in 2010, p.3

³⁷ Cancun Adaptation Framework (2012), pp.4-5, paras. 11-15

“55-55 double threshold”³⁸ for the ratifications had been met. The Agreement aims to enhance the implementation of the UNFCCC and to strengthen the global response to the threat of climate change. The most significant pledge of the Agreement is to hold “*the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre industrial levels.*”³⁹ Together with the mitigation measures, the Agreement incorporates the contexts of climate change adaptation, sustainable development, climate finance, capacity building, and risk reduction of loss and damage driven by the adverse effects of climate change. Considering its scope, the Agreement is the most comprehensive instrument of the global climate governance today. As of 2018, 176 out of 195 signatories have ratified the Agreement -among those the top CO₂ emitters such as the US, China, and India-; which raises the hopes and expectations on the governance of global climate change regime and mitigation efforts.

In brief, when we ground on the contents of all the aforementioned international institutions and instruments -let it be political or scientific-, we see that they gather under the same roof of “*climate resilience*” through the concepts of mitigation, adaptation and sustainable development. For the purposes of this work, in the next section, we will now address the climate resilience with an emphasis on adaptation.

1.3 Climate Resilience: Adaptation as a Pathway

To begin with, the generic term “resilience” is defined by IPCC in AR5 as “*the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.*”⁴⁰ Within the context of climate change, what we intend by resilience is “resilience to climate change”: the ability of systems -including societies or communities- to resist, absorb, accommodate, adapt to, transform and recover from

³⁸ Article 21 (1) of Paris Agreement (2015) states: “*This Agreement shall enter into force on the thirtieth day after the date on which at least 55 Parties to the Convention [UNFCCC] accounting in total for at least an estimated 55 per cent of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession.*”

³⁹ Article 2 (1a) of Paris Agreement (2015)

⁴⁰ The definition is retrieved from IPCC AR5 Glossary of Terms.

the hazardous effects of climate change in a timely and efficient manner.⁴¹ The achievement of substantial climate resilience depends on the blend of three channels: sustainable development, mitigation and adaptation. Sustainable development is the blanket of the triple nexus of climate resilience because it is a broader phenomenon that interacts with the other two channels. Sustainability holds utmost importance for the development strategies as a result of the incorporation of environmental and intergenerational considerations into development discourse, which ultimately relates to climate change. In this regard, mitigation is crucial in order to limit the levels of anthropogenic climate change, so in a sense coping with the root of the problem; however, the realization of mitigation is only possible in the long-run. Adaptation, on the other hand, seeks for immediate and flexible adjustments to actual or expected climate and its effects, in a way, learning to live with climate change.⁴² In synthesis, the integration of mitigation and adaptation strategies fosters sustainable development through counterbalancing climate change and its adverse impacts that stress the development processes.

Among these, adaptation as a pathway for climate resilience may be particularly seen as the highest priority in vulnerable contexts, *“because there are immediate benefits to be obtained by reducing vulnerabilities to current climate variability and extremes as well as future climate changes.”*⁴³ The adaptation methods; however, may differ according to time and space as well as to the needs of people, therefore there is not a single adaptation formula that fits for all. Primarily, adaptation can be ex situ or in situ, meaning that people respond to climate change either by simply migrating or by remaining in their places. It is also possible to classify adaptation according to the level of governance, such as local, regional, national or international. Moreover, adaptation can be categorized with regard to the timeliness of adaptation as pro-active (meaning that adaptation is anticipatory so before an incident occurs) or reactive (referring that adaptation is responsive to an incident that has already taken place).

⁴¹ The definition is compiled from the United Nations Office for Disaster Risk Reduction (UNISDR) Terminology.

⁴² The definition is harmonized from IPCC AR5 Glossary of Terms.

⁴³ IPCC AR5 Contribution of WGII Chapter 20 on Climate Resilient Pathways, p.1117

Furthermore, adaptation can be carried out through a top-down or bottom-up approach according to the driving force of adaptation. To set an example, in drought-prone semi-arid rural areas of developing states, a common adaptation strategy is to promote the use of drought-resilient seeds among local farmers or the switch to drought-resilient crops, along with trainings on simple water catchment methods. As the example illustrates, for the purposes of this work, we are focusing on in situ adaptation performed at a local level that is both proactive and reactive in timeliness with a bottom-up approach; that is all to say, community-based adaptation (CBA). Community-based adaptation embraces a participatory approach that involves local stakeholders -along with policymakers, climate scientists, development experts, and disaster risk specialists- in all decision making processes regarding adaptation; because it is mostly the vulnerable communities that encounter, suffer from and respond to locally and contextually specific climate change effects in the first place.⁴⁴ In this connection, the inclusion of local communities and utilization of their indigenous knowledge enhance the feasibility and acceptability of the adaptation strategies, and therefore the vulnerability reduction and adaptive capacity building.

Vulnerability and capacity are two important determinants of climate change adaptation that preferably act in opposite directions for an adaptation strategy to be successful. Thus, the preeminent objective of adaptation is to minimize the vulnerabilities of the communities against the adverse impacts of climate change whilst maximizing capacities to adapt and response to these effects. In this context, climate change adaptation is closely linked to disaster risk reduction (DRR), especially in relation to the concepts of vulnerability, resilience, and capacity. This is because human systems are affected by the climate change mostly through the extreme climate events or hazards (such as extreme temperature anomalies, droughts, floods, and cyclones) that evolve into disasters where vulnerability and lack of capacity exist.

⁴⁴ Ayers, J. and Forsyth, T. (2009) Community based adaptation to climate change. *Environment: Science and Policy for Sustainable Development*, 51 (4), p.5

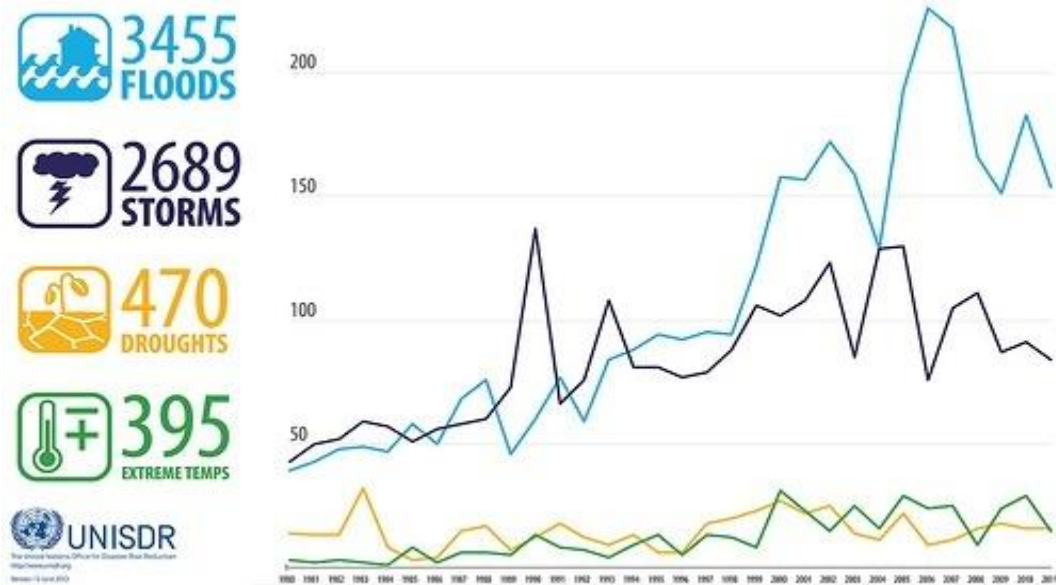


Figure 3. Number of Climate-related Disasters around the World 1980-2011⁴⁵

Figure 3 shows the gradual yet wavelike changes in the number of climate-related disasters around the world between the years 1980 and 2011, with a noticeable increase in the number of floods and storms. Consequently, the increasing trends in the frequency and intensity of climate-related extremes in the last decades pave the way for the interactive relations between the fields of climate change adaptation and disaster risk reduction, particularly once encountered with infrastructural and socio-economic vulnerabilities. In order to better understand this correlation, we will now address the paradigm of disaster risk reduction in the next sub-chapter.

1.4 Disaster Risk and Disaster Risk Reduction

Disaster risk as a concept is defined by IPCC as *“the likelihood over a specified time period of severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response.”*⁴⁶ When embedded in the context of climate change, disaster risk engages with the climate-related extremes that turn into disasters.

⁴⁵ The figure is taken from the UNISDR disaster statistics database.

⁴⁶ Field, C.B. et.al. (Eds.). (2012). Special Report of the Intergovernmental Panel on Climate Change on Managing Extreme Weather Events And Disasters To Advance Climate Change Adaptation (SREX), p.32

Figure 4 screens the broad interplay among climate change, adaptation and disaster risk. The climate change that principally results from anthropogenic GHG emissions leads to weather and climate extremes, and combined with vulnerability and exposure, disaster risk appears in the intersection point. As the disasters interfere with livelihoods and development processes, disaster risk and climate change adaptation come in view so as to ensure the immediate and future normal functioning of the communities through a sustainable development path. In order to achieve this, along with strengthening of the adaptation efforts, the disaster risk needs to be minimized, which directs us to disaster risk reduction that is the policy objective of disaster risk management.

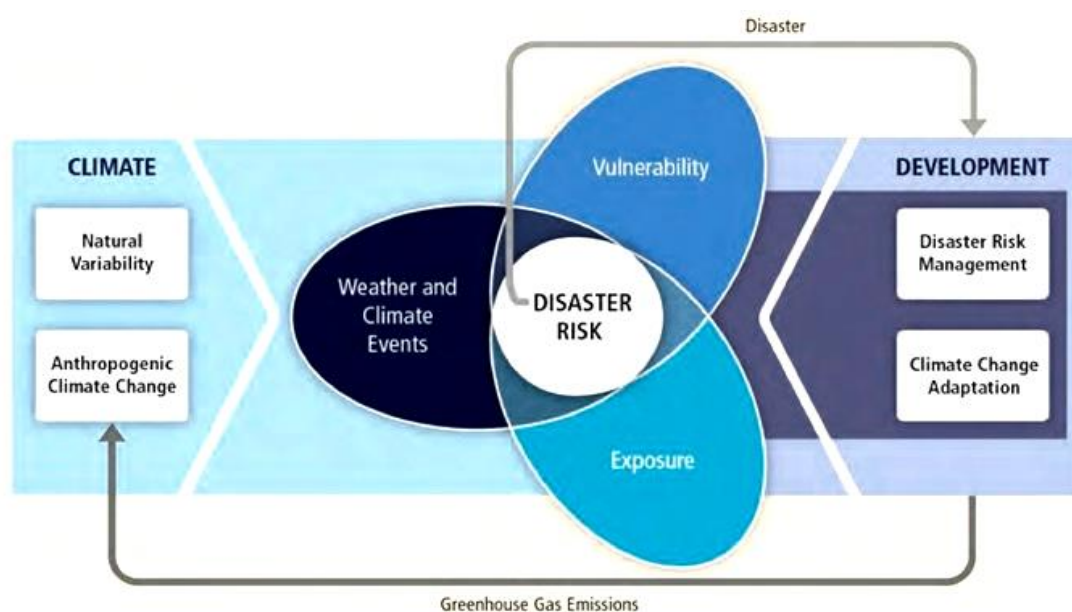


Figure 4. The Interacting Core Concepts of Climate Change Adaptation and Disaster Risk ⁴⁷

Disaster risk reduction aims at substantially reducing existing disaster risk, managing residual risk and preventing the creation of new risk through DRR strategies and policies that foster economic, social and environmental resilience and therefore the achievement of sustainable development.⁴⁸ For the purposes of this work, the modus operandi of disaster risk reduction can be best understood by the conceptual examination of the components of the disaster risk equation illustrated in Figure 5: Vulnerability, Hazard, Exposure and Capacity.

⁴⁷ The figure is taken from IPCC SREX, p.4

⁴⁸ The objectives of DRR are compiled from UNISDR Terminology.

$$\text{Disaster Risk: } \frac{\text{Vulnerability} \times \text{Hazard} \times \text{Exposure}}{\text{Capacity}}$$

Figure 5. Disaster Risk Equation

Vulnerability refers to the propensity or susceptibility of an individual, a community or systems to the impacts of hazards, in which the conditions are determined by physical, social, economic and environmental factors or processes.⁴⁹ Considering the position of the vulnerability component in the equation, the aim is to lower, minimize if possible, the value of vulnerability in order for the reduction of overall disaster risk.

Hazard stands for the potential occurrence of a natural or human-induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, and environmental resources.⁵⁰ In the context of climate change and disaster risk, the hazard component of the equation is affected by the changes in the frequency, intensity, and duration of weather and climate events.⁵¹ In the long run, thanks to the adaptation and mitigation efforts, the value of human-induced and climate-driven hazards could be diminished, which aligns with the purposes of disaster risk reduction.

Exposure is the presence of people; livelihoods; environmental services and resources; infrastructure; or economic, social, or cultural assets in places that could be adversely affected from hazards.⁵² The impact of the exposure component alone in the equation is not significant since in theory it is possible to set the exposure to hazards to almost zero through migration. The actual weight of exposure in the equation is closely related to vulnerability, because a community or system can be exposed to hazards; however, with a successful vulnerability reduction, the disaster risk may still be diminished.

Capacity is the combination of the strengths, attributes, and resources available to an individual, community, society, or organization; and it comprises adaptive capacity and coping capacity. While the adaptive capacity is those of that can be used to prepare for

⁴⁹ The definition is harmonized from UNISDR and IPCC Terminology.

⁵⁰ IPCC SREX Glossary of Terms, p.560

⁵¹ IPCC SREX, p.76

⁵² Ibid.

and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities⁵³, the coping capacity is the ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risk or disasters.⁵⁴ With regard to the disaster risk, bearing in mind the location of capacity component, the aim is to increase the capacity so that the value of overall disaster risk is lowered.

Among the components of the equation, the core determinants of disaster risk are vulnerability and capacity, which are also the point of intersection for climate change adaptation and disaster risk reduction paradigms. The two determinants are strongly affiliated with each other, because capacity is mostly utilized as a baseline in order to understand how vulnerable people or systems are to a specific hazard, i.e., vulnerability assessment.⁵⁵ This relationship is straightforward: vulnerability and capacity operate reversely that increasing capacity means reducing vulnerability, and high vulnerability means low capacity.⁵⁶ Therefore, for the communities exposed to disasters, the most practical and reliable way to reduce the disaster risk is to increase the capacity and decrease the vulnerability simultaneously, which simply means building resilience.

The challenges posed by the weather and climate events are harsh reality for many communities around the world, even though the disaster type, severity, and loss experienced are different. The common ground for these communities is the need for appropriate adaptation and disaster risk reduction strategies that are customized according to the specific geographical, social, economic, educational, and infrastructural conditions of a given community. The primary actors in the planning, implementation and evaluation of the strategic measures on this matter for local communities are the states that hold duties towards their citizens. For this reason, the state parties have become aware of the common challenges that they encountered in the governance and monitoring of risk reduction, risk identification, early warning systems, disaster response and recovery plans, and therefore, the need for a collective political action at international level in order to ensure more systematic action on building resilience globally. Especially after the adverse impacts of climate change on the intensity,

⁵³ IPCC SREX Glossary of Terms, p.556

⁵⁴ The definition is compiled from UNISDR Terminology.

⁵⁵ IPCC SREX, p.72

⁵⁶ Ibid.

frequency and duration of the extremes around the world; the international cooperation on disaster risk management has gradually gained strength. In this regard, the latest documents that shape the global partnership on disaster risk management and resilience are Hyogo Framework for Action Building the Resilience of Nations and Communities to Disasters 2005-2015 (HFA) and Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR).

The Hyogo Framework for Action was adopted in 2005 in Kobe, Hyogo, Japan during the World Conference on Disaster Reduction, by 168 governments; in order to take action to reduce disaster risk, to reduce vulnerabilities, and to cope better with the hazards that threaten their development processes.⁵⁷ In this regard, the HFA established five specific objectives to be fulfilled by 2015, and identified five priorities for action and key activities for the achievement of the goals.⁵⁸ The international community showed a marked progress under the umbrella of HFA with a 10-year time frame and commitment for the implementation; however, the disasters have continued to exact a heavy toll around the world, and the gaps have been persistent. After the end of the commitment period of HFA, the international community gathered in Sendai, Japan for the Third World Conference on Disaster Risk Reduction in 2015, and adopted the Sendai Framework with a commitment period of 15 years between 2015 and 2030. The Sendai Framework is considered to be an improved follow-up to the previous HFA commitments and aims to “*achieve the 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.*”⁵⁹

For the achievement of the expected outcome, the SFDRR has determined seven global targets, guiding principles and four priorities for action that have brought innovative ways of thinking on global disaster risk reduction governance. The four priorities are identified as:

- Understanding disaster risk
- Strengthening disaster risk governance to manage disaster risk
- Investing in disaster risk reduction for resilience

⁵⁷ PreventionWeb. (n.d.). About the Hyogo Framework for Action (2005-2015).

⁵⁸ For further information, refer to Hyogo Framework for Action, pp.3-12, paras 10-20

⁵⁹ Sendai Framework for Disaster Risk Reduction (2015), p.12, para16

- Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction ⁶⁰

The innovative aspects are found throughout the key actions determined for the priorities of action. To begin with, the state parties to the Framework acknowledge that *“policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.”*⁶¹ This proves that disaster risk reduction is understood to be most effective and successful when all dimensions and the interplay among the dimensions are taken into account, which evokes the disaster risk equation and its working principles. Secondly, under disaster risk governance, the Framework draws specific attention to the importance of local level action and participation along with other relevant stakeholders such as civil society and indigenous peoples in the disaster risk management processes. Therefore, one of the key actions is designed *“to empower local authorities, as appropriate, through regulatory and financial means to work and coordinate with civil society, communities and indigenous peoples and migrants in disaster risk management at the local level.”*⁶² This arrangement is specifically applicable for the climate-related disaster risk reduction programs since the climate extremes and harms are mostly experienced at a local level, the policies and practices should be developed and coordinated with the locals and communities, that is to say, should be community-based. Thirdly, the Framework highlights the critical need for the provision financial mechanisms both to ensure the implementation of policies, strategies and plans and to reduce the financial impact of disasters, such as public and private investments on infrastructure and insurance services for disaster risk prevention and reduction.⁶³ Fourthly, the Framework includes in its scope the significance of the *“sustainable use and management of ecosystems and integrated environmental and natural resource management approaches that incorporate disaster risk reduction”*⁶⁴.

⁶⁰ Ibid., p.14, para 20

⁶¹ Ibid., p.14, para 23

⁶² Ibid., p.18, para 27(h)

⁶³ Ibid., p.18, para 29

⁶⁴ Ibid., p.20, para 30(n)

The extension is to the point since the proper management of natural resources such as land and soil plays a vital role in reducing the disaster risk for climate-related extremes. For instance, the forests may help to diminish the likelihood of exposure to floods and droughts. Fifthly, the Framework places a great emphasis on sophisticated forecasting, early warning and communication systems that are people-centered, localized, multi-hazard and multi-sectoral.⁶⁵ Especially in rural and remote areas that are exposed to devastating impacts of hazards, people-centeredness and localization of forecasting and early warning systems take precedence, together with the consideration of low-cost and simple equipment and facilities. Lastly, the Framework underlines the possibility of turning exposure to disasters into an advantage through “building back better” during the recovery, rehabilitation and reconstruction phases.⁶⁶ In this way, the communities, infrastructures and economies will be more resilient for the possible future disasters; therefore the damages will be far less minor. There still lays a period of 12 years in front of the states as of 2018 in order to pursue, implement and complete the set objectives of SFDRR, and in progress of time, we will see the level of progress and results achieved in global disaster risk management.

All in all, in the first chapter, we respectively addressed the scientific basis and evidence of climate change with numbers and graphics that are compiled from various reliable scientific data sources; the global political cooperation mechanisms such as UNFCCC, the remarkable COP sessions, Kyoto Protocol and Paris Agreement that are designed to act upon the mitigation of climate change; the climate resilience and adaptation as a pathway in order to deal with the impacts and challenges posed by climate change and its symptoms; and lastly the disaster risk reduction framework that is the corner stone for physical, economic, social and environmental resilience building in the wake of increasing intensity and frequency of climate and weather extremes that threaten the normal functioning of human systems.

In the second chapter of this thesis, we will examine the trio of climate change, human rights and sustainable development. The first part will shortly cover the theoretical relationship between the human rights and climate change discourses. The second part will be devoted to the practical relevance of human rights and climate change through

⁶⁵ Ibid., p.21, para 33 (b)

⁶⁶ Ibid., p.21, para 32

the implications of climate change on the enjoyment of the five selected human rights: right to life, right to adequate standard of living, right to food, right to water and sanitation and right to health. The third part will address the paradigm of sustainable development, the sustainable development goals (SDGs) framework, and the impacts of climate change on the achievement of six selected SDGs -SDG 1, SDG2, SDG3, SDG6, SDG 13 and SDG15-that are relevant to the purpose of the thesis. The last part of the second chapter will elaborate on the coordination and engagement of climate change, disaster risk, human rights and sustainable development discourses in the post-2015 global sustainability agenda, and will illustrate how they are inextricably interdependent on one another.

2. CLIMATE CHANGE, HUMAN RIGHTS AND SUSTAINABLE DEVELOPMENT

2.1 Human Rights and Climate Change

Anthropogenic climate change has harmful direct or indirect impacts on human systems around the world. It already interferes with the normal functioning of communities in various ways, and in the near future it may reach to the point that lives of human beings may be at stake. Thus, right to life being at the forefront, “*climate change will undermine –indeed, is already undermining- the realization of broad range of internationally protected human rights.*”⁶⁷ For this reason, “human rights” has become one of the normative frameworks that have been employed to think about climate change most recently.⁶⁸

Human rights refer to rights and freedoms that every human being is inherently entitled to regardless of race, nationality, ethnicity, sex, language, religion, or any other status. These right or freedom entitlements firstly have been written out in the 1948 Universal Declaration of Human Rights (UDHR), as a non-binding normative threshold. In 1966, the International Covenants on Civil and Political Rights (ICCPR) and on Economic, Social and Cultural Rights (ICESCR) have laid out the list of rights and freedoms in legally binding treaties. All the state parties that ratified the Covenants are legally bounded by the Covenants; therefore an international human rights regime has been established since then. Today, there are nine core international human rights instruments⁶⁹ that underpin the primary sources of international human rights regime. In human rights law, the core human rights treaties are supplemented by regional and national case laws, soft law instruments like declarations, and customary international law. The operation mechanism of human rights law in the simplest term is straightforward: the states are the primary actors as duty bearers, and their citizens or inhabitants are the right holders. The states hold the duty to respect, protect and fulfill the human rights and freedoms of the citizens under their jurisdiction, and when there is

⁶⁷ Humphreys, S. (2009). Introduction: Human rights and climate change. In *Human Rights and Climate Change*, p.1

⁶⁸ Caney, S. (2009). Climate change, human rights and moral thresholds. In S. Humphreys, *Human Rights and Climate Change*, p.69

⁶⁹ The nine core international human rights treaties are chronologically as follow: UDHR, ICCPR, ICESCR, ICRD, CEDAW, CRC, UNCAT, ICMW, and CRPD.

violation, the citizens claim their rights. Interestingly, the states are both the protector and violator of human rights and freedoms. Therefore, the primary responsibility is assigned to the state parties. It is also state's responsibility to protect the rights and freedoms of people (citizens or other inhabitants) against a violation by a third party. Despite "*human rights also carry formal interstate obligations, their duties are primarily held toward citizens, and so are generally kept, broken or challenged at national level.*"⁷⁰ However, state's duties toward their citizens can be carried to regional or international arena.

In the context of human rights and climate change, the application of basic functioning principles of human rights law to the domain of climate change complicates the interdisciplinary relationship between the fields. Firstly, the drivers and adverse impacts of climate change are global in nature that "*the actions taken in one part of the world had consequences in other parts.*"⁷¹ The previous extensive carbon emissions of the industrialized countries affect the populations in parts of the world to be hit hardest by climate change. If we are to establish the framework of duty bearer and right holder, in case of rights violation by impacts of climate change, the "*responsibility for impacts in the most vulnerable countries lies not with the government nearest to hand, but with diffuse actors, both public and private, many of whom are located far away.*"⁷² There arises an extraterritorial responsibility that is often difficult to establish in the human rights regime because the identification of a specific perpetrator is not possible. In case of violation of rights by climate change impacts, a person's own state is still responsible to respect and protect the rights and freedoms in question and this may include strengthening own mitigation efforts as duty to respect and adaptation strategies as duty to protect.⁷³ However, it is grueling for the state party to fulfill the obligations successfully unless the primary perpetrators in distance also act upon the mitigation processes. Therefore, the duty to respect, protect and fulfill is diffused upon multiple countries in order to fully guarantee the enjoyment of rights and freedoms of a person that falls under the jurisdiction of another state. Secondly, "*since climate change is*

⁷⁰ Humphreys, S. (2009). Introduction: Human rights and climate change, p.11

⁷¹ Ibid., Competing claims: human rights and climate change, p.38

⁷² Humphreys, S. (2009). Introduction: Human rights and climate change, p.11

⁷³ Bodansky, D. (2010). Introduction: Climate change and human rights: Unpacking the issues. *Georgia Journal of International and Comparative Law*, 38 (3), p.520

attributable primarily to emissions by private actors (...) a crucial question is whether the duties to respect, protect, and fulfill apply to private actors as well as to states."⁷⁴ In human rights law, the duties are imposed on states, and the states may limit the activities of private actors such as factories or power plant complexes to a certain extent, in order to fulfill their duty to protect toward the people under their jurisdictions against climate change. The private actors *per se* are not considered as the subjects of international law that are legally bounded by the duty to respect, protect and fulfill the rights and freedoms of individuals or groups in international human rights regime.⁷⁵ Thus, the direct obligations to ensure human rights are not applicable for the private actors. The transnational nature of the private entities that are responsible for the greatest portion of GHG emissions and the abundance of individuals and acts involved in the emission processes that are spread around the world also complicate the assignment of a specific direct liability. In this regard, the private actors are involved in the matter mostly on voluntary basis, with the commitments of "corporate social responsibility" and "going green". Thirdly, in climate change regime, there exists an inter-state right holder and duty bearer mechanism. The principle of "common but differentiated responsibilities" and the differentiation of states as Annex I and non-Annex I countries⁷⁶ in the climate change instruments pave the way for this mechanism when combined with the claims for collective "right to development" that entered into human rights discourse in the last decades. The poor unindustrialized states claim their right to development that requires the continuation of high rates of carbon dump, so they become right bearers. In return, the rich industrialized states become duty-bearers that hold the responsibility to protect, respect and fulfill the right to development of other states by agreeing to the different measures in mitigation efforts. Therefore, both the claimant and provider of a right in this case are state parties, which bring out state-to-state duty within the context of human rights.

The theoretical compatibility of the relationship between human rights and climate change may seem complex; however, the connection becomes self-evident once examined in practical terms. The themes and human rights considerations at stake in

⁷⁴ Ibid., p.521

⁷⁵ Humphreys, S. (2009). *Competing claims: human rights and climate change*, p.61

⁷⁶ Annex I countries are industrialized countries and economies in transition while non-Annex I countries are developing countries.

relation to climate change are numerous. To briefly illustrate, the adverse impacts of climate change on environmental components like water and air cause problems on human health and wellbeing, which relates to basic human rights such as right to life, right to health, and right to water. Moreover, the extreme weather and climate events often lead to loss of human lives, affect agricultural production and economic activity, and interrupt development processes that are in connection with right to life, right to food and right to development. Furthermore, rising temperatures and climate variability together with environmental degradation affect adversely forestry, natural resources and ecological balance that are of prime importance for indigenous communities that are strongly linked to their traditional lands and nature, which leads us to indigenous people's rights branch of human rights.⁷⁷ Besides, the emerging concept of "climate refugees" (or persons displaced across borders as a result of climate change) is directly associated with migration and immigrant rights branch of human rights. In fact, the specialized funds and programs of the UN, such as UNEP and UN Refugee Agency (UNHCR), and various non-governmental organizations (NGOs) have started to produce reports and studies on climate change dimensions of human rights in the last decade. Thus, the practical implications of climate change on human, social and economic environments have facilitated the establishment of an interdisciplinary relationship between the fields.

For the purposes of this work, the range of rights to be examined in relation to climate change is narrowed down to 5 internationally recognized basic rights: right to life (Article 6 of ICCPR), and right to adequate standard of living (Article 11 of ICESCR), right to food (derived from Article 11 of ICESCR), right to water and sanitation (derived from Articles 11 and 12 of ICESCR), and right to health (Article 12 of ICESCR). In the next section, we will now touch upon the ways climate change interferes with and endangers the enjoyment of the human rights identified above.

2.2 The Human Rights Implications of Climate Change

Climate change, as discussed in the first chapter, has profound effects on terrestrial and aquatic ecosystems, hydrological cycles, atmospheric system, natural resources and

⁷⁷ Aminzadeh, S.C.(2007). A moral imperative: Human rights implications of climate change. *Hastings International and Comparative Law Review*, 38 (2), p.256

environment, gradually disturbing the functioning of natural systems around the globe. The changes in the natural functioning of these systems correspondingly alter the quality and quantity of environmental endowments available such as air, water, and land. Human beings are dependent upon primarily these ecosystem services that are vital for their survival: air to breathe, water to drink and food to eat. These basic needs of human beings are recognized as human rights entitlements with the development of international human rights regime, along with right to life, right to adequate standard of living and right to health. Right to food and right to water have been substantially derived from right to adequate standard of living and right health, and later they have become stand-alone human rights that are characterized as preconditions for the realization of other rights. According as climate change has started to upset the balance of environmental endowments, therefore basic needs and related human rights, it has been recognized that “*a clean, healthy and functional environment is integral to the enjoyment of human rights, such as the rights to life, health, food and an adequate standard of living.*”⁷⁸ At that point, the impacts of climate change on the environment and thereby on these basic human rights have become the main point of conversation since the severity of the implications of climate change on human lives and health has been acknowledged, and the language of rights facilitates the communication of the threats in a more convincing manner. In the following sections, the impacts of climate change on the aforementioned five selected human rights will be addressed severally.

2.2.1 Right to Life

The fundamental human right to life is recognized and codified in the Article 6 (1) of ICCPR by stating that “*every human being has the inherent right to life.*”⁷⁹ Climate change is recently mentioned as a stressor that threatens the full enjoyment of this fundamental right, among many others. Climate change interferes with the exercise of right to life directly and indirectly. In other words, sudden-onset events pose a direct threat to human lives and safety, as well as more gradual forms of environmental degradation undermine access to clean water, food, and other key resources that support human life.⁸⁰ To set an example for the direct threats, in tropical low-lying coastal areas

⁷⁸ UNEP.(2015). Climate Change and Human Rights, p.13

⁷⁹ Article 6 of ICCPR (1966)

⁸⁰ UNEP.(2015). Climate Change and Human Rights, p.2

*“the projected increase in the intensity of tropical cyclones, exacerbated by sea level rise and the degradation of ecosystems that provide protection from storms and flooding, will pose a direct threat to human lives and coastal settlements.”*⁸¹ The indirect threats of climate change to human lives are more complicated and interconnected to other health-determining factors. The devastating impacts on environmental determinants of life such as air, water, and food have the potential to turn into a deadly weapon. For instance, extremely high temperatures increase the death toll resulting from cardiovascular and respiratory diseases particularly among elderly people in Europe.⁸² Moreover, warming temperatures combined with evaporation of freshwater resources and variable precipitation patterns trigger the increasing prevalence of water-borne and vector-borne diseases that easily turn into deadly epidemics in Africa. Furthermore, the adverse impacts of droughts, floods or other events on food production and livelihoods cause food scarcity and under nutrition in arid and semi- arid regions in Africa and Asia, which may turn into hunger crisis that results in starving people to death in the long run. Therefore, while the patterns that climate change threatens lives appear diverse around the world, it is estimated that millions of people will be at risk of losing their lives unless adequate adaptation and disaster risk reduction measures are customized accordingly.

2.2.2 Right to Adequate Standard of Living

The right to adequate standard of living is present and codified in the Article 11 (1) of ICESCR as: *“the States Parties to the present Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions.”*⁸³ As it is seen, the content of the right is broad from the outset, and the realization of each aspect is essential in order for the right to be considered fully enjoyed.

Climate change poses a threat to the enjoyment of this right through the devastating impacts on food, water, housing, properties, livelihoods and economic activities. The food and water aspects are examined in detail under the following sub-sections,

⁸¹ Ibid., p.4

⁸² The information is taken from World Health Organization (WHO) Regional Office for Europe Webpage, Data and Statistics section.

⁸³ Article 11 of ICESCR (1966)

therefore housing, properties, livelihoods and economic activities will be the point of discussion herein. To begin with, the climate-driven hazards such as sea level rise, storms and floods cause serious damages to the houses, settlements, properties and infrastructure. For instance, it is predicted that the tropical coastal systems in low-lying areas such as small island states will increasingly experience submergence and flooding primarily due to sea level rise, and the projected increase in the intensity of tropical cyclones will exacerbate the threats to lives and settlements.⁸⁴ This means that in the simplest form, a broad spectrum of city functions and infrastructures will be damaged so that the provision of services such as electricity and water will be interrupted, affecting the businesses and domestic life. In the worst case scenario, the damages could reach the point that the inhabitants will lose their homes, assets, and businesses, which results in displacement. Moreover, climate change will affect a variety of economic sectors and services, including energy, agriculture and livestock, forestry, fisheries, and tourism.⁸⁵ The sectors of agriculture and livestock, forestry, and fisheries are particularly exposed to the impacts of climate change since they rely on natural resources. In this regard, “*due to a greater dependence on agriculture and natural resources, such as fisheries and forests; and existing vulnerabilities caused by poverty, lower levels of education, and physical isolation*”⁸⁶, the rural populations are uniquely susceptible to adverse impacts of climate change on livelihoods. This particular vulnerability of rural areas and their economic sectors may perpetuate a vicious circle of poverty. The incomes of agriculturist become lower because of reduced production due to adverse climate change impacts, on the other hand the prices of scarce products -because of reduced production or availability due to climate change impacts- such as food and water increase, and the purchase power diminishes. Therefore, the enjoyment of right to adequate standard of living in this case becomes jeopardized, in concern with loss of livelihoods, inadequate income, and scarcity and costliness of staple products for consumption.

In short, climate change endangers the realization of right to adequate standard of living in various ways, directly and indirectly, around the globe. The adverse impact ranges

⁸⁴ UNEP. (2015). Climate Change and Human Rights, p.4

⁸⁵ Ibid., p.6

⁸⁶ Ibid.

from loss of lives to loss of housing, properties, assets, business, and livelihoods, which result in inadequate income, insufficient access to basic commodities such as food, water and clothing, poverty, and ill health. The severity and consequences of impact also depend on geographical and socio-economic vulnerabilities, therefore the communities in hazardous areas and developing states are at peril. However, the appropriate adaptation and disaster risk reduction programs could minimize and control the risks and damages, therefore, the climate change driven limits on the enjoyment of right to adequate standard of living can be lifted.

2.2.2.1 Right to Food

The right to food is initially derived from the Article 11 of ICESCR within the statements of “... *including adequate food*” and “... *recognizing the fundamental right of everyone to be free from hunger*”.⁸⁷ The core elements of right to food are framed in the General Comment No. 12 (1999) of Committee on Economic Social and Cultural Rights (CESCR), and in 2009, UN General Assembly with the Resolution 64/159 explicitly recognized the human right to food. The instruments underline that the content of right to food includes the availability of food in sufficient quantity and quality, accessibility, nutritious and dietary values; so that reaffirming “*the right of everyone to have access to safe, sufficient and nutritious food.*”⁸⁸ The enjoyment of right to food is a precondition for the enjoyment of all other fundamental human rights such as right to life and right to health.

Human beings are dependent on the agricultural production systems in order to meet the basic food needs, along with fisheries and livestock farming. In this regard, climate change poses a significant threat to the food production, fisheries and livestock industries and therefore challenges the food security around the globe. However, the scale for risks for food insecurity exacerbated by climate change differs from region to region in the world, so that “*regions already vulnerable to food insecurity and societies that depend on natural resources or practice climate sensitive activities [...] will be particularly vulnerable to the impacts of climate change and at an increased risk of*

⁸⁷ Article 11(2) of ICESCR (1966)

⁸⁸ The content of right to food is compiled from the abovementioned instruments.

*food insecurity as a result.*⁸⁹ The erratic precipitation patterns, prolonged droughts, high temperatures, and other climate hazards are the most common factors that affect the agricultural production on land. The rainfall variability and seasonal shifts result in destruction of crops either as a result of untimely excessive rainfall or lack of rainfall therefore diminishing agricultural yields and reduced production. The prolonged droughts and high temperatures dry out the crops in arid and semi-arid regions in the world especially where the rain-fed agriculture is common, water scarcity problem exists and irrigation is not possible. The climate hazards such as storms and floods damage the fields and generally sweep away the crop plants that cause bad harvest. When we come to fisheries, the warming temperatures in the sea waters, acidification, and marine ecosystem deterioration pose a threat to the biotope of marine animals, which affect the quality and quantity of sea food products that are provided for human consumption. The livestock farming is affected by the climate change indirectly but significantly. The decrease in freshwater resources as a result of evaporation, high temperatures and lack of rainfall influences the amount of drinking water available for cattle; the dried pasturages and decreased production of crops of which by-products are utilized as fodders also affect the animal feeding, which altogether threatens the sustainability of animal products. Taken into account the impacts on agriculture, fisheries and husbandry, we infer that the quantity and quality of overall food produced decreases, which affect availability and nutritious utilization of sustenance; and the reduced production also leads to the increased prices in the market for that food product thus concordantly accessibility diminishes.⁹⁰ Consequently, in short, the food insecurity increases, and in vulnerable contexts where appropriate adaptation and disaster risk measures are not applied, it reaches to the point of chronic poverty and hunger crises that threaten the enjoyment of right to food that is vital for human survival.

2.2.2.2 Right to Water and Sanitation

The right to water is implicitly derived from Article 11 and 12 of ICESCR, in connection to the rights to adequate standard of living and health. In fact, in 2003 the normative and legal bases of right to water and sanitation were founded upon these

⁸⁹ Chaplin, D. et. al.(2017). The Impacts of Climate Change on Food Security and Livelihoods in Karamoja, p.14

⁹⁰ Ibid., p.15

articles when CESCR concluded the General Comment No: 15. Later in 2010, the UN General Assembly with the Resolution 64/292 explicitly recognized the human right to water and sanitation. Furthermore, in 2011, the Human Rights Council (HRC) reaffirmed, through Resolution 16/2, access to safe drinking water and sanitation as a human right. In the instruments it is noted that, the sufficiency, quality and safety, accessibility, and affordability of water for personal and domestic use are crucial in order to evaluate the enjoyment of this right.⁹¹ In this regard, according to the World Health Organization (WHO), “*between 50 and 100 liters of water per person per day are needed to ensure that most basic needs are met and few health concerns arise*”⁹², so that it can be regarded as sufficient. In emergency situations, a minimum of 15 liters of water per person per day is needed in order for human survival.⁹³ The quality and safety of water is critical with regard to drinking water and water used for hygiene and sanitation purposes in order to ensure general personal hygiene and to prevent the transmission of waterborne diseases. The safety of water is mostly evaluated by local and national standards that are based on the international guidelines most important of which is WHO Guidelines for Drinking-Water Quality. Moreover, the physical accessibility and immediate vicinity of water matters in the assessment; and according to WHO, “*the water source has to be within 1,000 meters of the home and collection time should not exceed 30 minutes.*”⁹⁴ Lastly, the affordability of water and water facilities counts an aspect of right to water and “*the United Nations Development Program (UNDP) suggests that water costs should not exceed 3 per cent of household income*”⁹⁵, to be considered affordable.

The nature provides us with water that is indispensable for our survival and health. The water cycle determines the abundance and distribution of freshwater resources on earth that are utilized for human consumption. Climate change interferes with the natural functioning of the water cycle; therefore, it alters the capacity and availability of freshwater resources in different parts of the world. To begin with, “*climate change is*

⁹¹ The aspects are compiled from the abovementioned instruments.

⁹² Office of High Commissioner for Human Rights (OHCHR). (2010). Factsheet No:35 on Right to Water, p.8

⁹³ WHO. (2013). Technical notes on drinking-water, sanitation and hygiene in emergencies No.9: How much water is needed in emergencies, p.2

⁹⁴OHCHR. (2010). Factsheet No:35 on Right to Water, p.10

⁹⁵ Ibid., p.11

*projected to reduce renewable surface water and groundwater resources significantly in most dry subtropical regions*⁹⁶ such as Central America, due to the increasing temperatures, evaporation and reduced precipitation. Moreover, whilst wet regions and seasons become wetter, dry regions and seasons become drier.⁹⁷ The reduced precipitation (rain and snow) results in fewer water supplies for recharge of rivers and streams, and warming increases evaporation on the present water resources: there exists a double adverse effect. Therefore, the potential for water scarcity in presently dry areas is high and the scarcity intensifies the competition that results in higher prices for water. In this way, the availability, accessibility and affordability of water are threatened in many parts of the world. To illustrate, it is stated that with the existing climate change scenario, global population growth and water demand “*at present, an estimated 3.6 billion people (nearly half the global population) live in areas that are potentially water-scarce at least one month per year, and this population could increase to some 4.8–5.7 billion by 2050.*”⁹⁸ Furthermore, the regions in which warmer water temperatures and increased rainfall are jointly present, such as Southeast Asia, the quality of water becomes a matter of consideration. The warmer temperature alters the physical and chemical properties of water and heavy rainfall loads the water resources with pollutants⁹⁹, which drops off the quality of water. At this point, the safety and quality aspects of right to water come to the forefront. For example, “*since the 1990s, water pollution has worsened in almost all rivers in Africa, Asia and Latin America. The deterioration of water quality is expected to further escalate over the next decades.*”¹⁰⁰

The predicted water scarcity and water pollution expectedly have an impact on the sanitation conditions around the world. The water use for personal and domestic hygiene in the scenario of water scarcity will decrease drastically since the priority is given to the water use for basic needs. The maintenance of sanitation facilities such as pit latrines and sewer systems is affected by climate change simultaneously due to the extreme events like floods and water scarcity. Accordingly, in the case of water

⁹⁶ IPCC AR5 Contribution of WG II Chapter 3 on Fresh Water Resources , p.12

⁹⁷ Ibid., p.13

⁹⁸ United Nations World Water Development Report.(2018), p.3

⁹⁹ IPCC AR5 Contribution of WG II Chapter 3 on Fresh Water Resources, p.4

¹⁰⁰ United Nations World Water Development Report. (2018), p.3

contamination because of heavy rainfall or floods, the water-borne epidemics will increase and threaten the human health and the environment.

In short, climate change interferes with the enjoyment of basic human right to water and sanitation in various ways in different parts of the world. In the extreme cases, the water scarcity may lead to water crisis in the most vulnerable dry lands, threatening lives, public health and security due to over competition for water. Thus, in the absence of proper adaptation and disaster risk strategies -such as sensitization for sanitary services, water catchment plans, and nature-based water resources management-, the adverse impacts of climate change may present a greater danger to the realization of right to water and sanitation for about some 5 billion people by 2050 as predicted.

2.2.3 Right to Health

The right to health is explicitly found and codified in the Article 12 (1) of ICESCR as *“the States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.”*¹⁰¹ The content of this right has been frequently associated with access to health care and treatment; however, in 2000, the General Comment No: 14 of CESCR clarified that *“the right to health [...] extends to the underlying determinants of health, such as food and nutrition, housing, access to safe and potable water and adequate sanitation, safe and healthy working conditions, and a healthy environment.”*¹⁰² Therefore, it is affirmed that the full enjoyment of right to health depends upon the fulfillment of other human right entitlements such as right to food and water.

Climate change affects the realization of this right directly and indirectly, most prominently through the adverse impacts on the underlying determinants of health. Firstly, extreme high weather temperatures and heat waves increase the incidents of cardiovascular and respiratory problems because the proper functioning of circulatory and respiratory systems is temperature-sensitive. Therefore, the interference of warm air temperature with the body thermoregulation, the health problems such as heart attack, asthma, and blood circulation disorders become more prevalent especially among elderly. Secondly, extreme high weather temperatures affect the balanced proportion of

¹⁰¹ Article 12 of ICESCR (1966)

¹⁰² CESCR General Comment No. 14: The Right to the Highest Attainable Standard of Health , para.11

parasites and bacteria in the environment due to the fact warmer weather establishes a more favorable condition for the reproduction of certain types of microorganisms, leading to the vector-borne diseases. For instance, it is noted that in the highlands of East Africa, the incidents of malaria has increased especially among children under 5 years old as a result of more favorable air temperature for the reproduction of plasmodium parasites that cause malaria and for the presence of anopheles mosquitoes that transmit the disease between individuals.¹⁰³ Moreover, when combined with heavy precipitation, the malaria risks increase even more because of the fresh breeding sites for the mosquitoes and water contamination. Another vector-borne disease that is climate sensitive is the dengue fever commonly seen in Southeast Asia. The high temperature, humidity, and rainfall are positively associated with dengue incidences, since the principal vectors for dengue and mosquitoes find a suitable environment for breeding and transmission.¹⁰⁴ Thirdly, heavy rainfall and flooding exacerbate the human exposure to water-borne diseases. The heavy rainfall and floodwater spread the contaminants in the air and water cycle, and the floods may destroy drainage and sewer systems that drinking water and surface water resources become further contaminated with pathogens that cause hepatitis A, diarrhea, typhoid or cholera in immediate surroundings. When the increasing air and water temperatures are added to heavy precipitation and humidity, the environment becomes more suitable for the breeding ground of these pathogens so that the risk for the infection rises. In a nutshell, both water-borne and vector-borne diseases are correlated with the humidity, temperature and precipitation conditions that are adversely affected by the changing climate. Fourthly, as explained in the previous sub-chapters, the impacts of climate change on agricultural production systems therefore food quantity and quality, and on water availability and quality threaten the right to health through malnutrition, under nutrition and water-and-food borne diseases. The pathogens of hepatitis A, typhoid, cholera and diarrhea may also infect individuals through contaminated fresh food resulting from contaminated irrigation water.

In this juncture, it is important to bear in my mind that some of the diseases under discussion are easily preventable, controllable or treatable with vaccinations, prevention

¹⁰³ IPCC AR5 Contribution of WG II Chapter 11 on Human Health, p.722

¹⁰⁴ Ibid., p.725

pills and treatment through medical interventions, which depends on the public health and adaptation capacity of governments. Thus, the interplay between geographical, socio-economic, infrastructural vulnerabilities and adaptation capacities is crucial for the final consequences of the climate related health impacts. Nonetheless, in a base case socio-economic scenario, i.e., under middle income- middle economic growth, between 2030 and 2050, climate change is expected to cause approximately 250.000 additional deaths per year mainly from malnutrition, malaria, diarrheal diseases and heat stress.¹⁰⁵ Certainly, the extent of exposure to these serious health impacts and deaths is at variance around the world. In this regard, for example, sub-Saharan Africa and south Asia are projected to have the greatest burdens of mortality and health impacts attributable to climate change.¹⁰⁶

To sum up, the right to health, along with the rights to life, adequate standard of living, adequate food, and water and sanitation, is negatively affected by the symptoms of climate change such as warming air and water temperatures, extreme precipitation patterns, and floods. The underlying determinants of health, such as adequate and nutritious food, safe and potable water, and adequate sanitation connect the right to health with the comprehensive right to adequate standard of living; and the critical endangerment of right to health relates to the scope of right to life. Therefore, the scopes of the nexus of rights chosen for this analysis are of utmost importance, complementary and inseparable within the international human rights framework, and also relevant for the essence of the recent global agendas for climate change, disaster risk and sustainable development that have been grounded upon the basic premises of these rights. In the next section, we will first address the paradigm of sustainable development pursuant to climate change, secondly elaborate on the 2030 Agenda for Sustainable Development through the Sustainable Development Goals (SDGs) Framework, and then cover the implications of climate change on the six selected SDGs that are relevant in terms of theme and scope to the nexus of rights examined above.

¹⁰⁵ WHO.(2014). Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s, p.1

¹⁰⁶Ibid., p.13

2.3 Sustainable Development and Climate Change

Development has been, and still is, the sole and ultimate goal to be pursued by all the countries in the world in the modern era. The origins of international development thinking prioritized “*economic growth and the application of modern scientific and technical knowledge as the route to prosperity [...]*.”¹⁰⁷ The industrial modernization of economies and entry to global capitalist system has been regarded to be the key for national economic growth that at the end contribute to the global development. However, the rapid globalization in 1990s revealed the widening socioeconomic disparities between the developed and developing world and the neoliberal policy prescriptions for economic growth failed the developing nations¹⁰⁸, in the meanwhile the advancing climate science informed the international community on the excessive GHG emissions, depletion of ozone layer, environmental pollution and degradation that industrialization processes caused. After this point, the development paradigm revised the classical thinking and shifted the emphasis from pure economic growth to a more holistic approach that takes into account socio-economic structures, political factors, social development, environment and natural resources within a development process, that is, sustainable development.

Sustainable development is commonly defined as “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*”¹⁰⁹ Sustainable development aims at balancing the economic growth, environmental integrity and ecological capacity, social development and equity in present and for the future. In other words, sustainable development is a multi-dimensional way of thinking about the economic, social, and environmental dynamics in a system context of development.¹¹⁰ Therefore, sustainable development consists of three pillars, as illustrated in Figure 6:

- Environmental
- Economic
- Social

¹⁰⁷ Elliott, A.J. (2013). What is sustainable development, In *An Introduction to Sustainable Development* (4th ed.), p.26

¹⁰⁸ Ibid., pp.26-30

¹⁰⁹ World Commission on Environment and Development. (1987). *Our Common Future*, p.1

¹¹⁰ Flint, R.W. (2013). Basics of sustainable development, In *Practice of Sustainable Community Development*, p.35



Figure 6. Venn Diagram of Sustainability ¹¹¹

Environmental sustainability and development pillar relates to the environmental preservation and natural resources management, considering that overconsumption of natural resources beyond irreversible state, environmental pollution and degradation threaten the sustainability of ecological systems in the future. Social sustainability and development pillar centers upon the social justice and equity, so that development process is to ensure the provision of equal access jobs, education, natural resources, and services for all people; therefore enhancing total societal welfare and human development.¹¹² Lastly, the economic pillar addresses that the economic growth has to continue in the light of increasing population growth and human needs around the world; however, without damaging the environment and stressing the natural resources.

Sustainable development has become a global aspiration to be pursued; however, the challenges exist, one of which is the climate change and its symptoms. The relationship between sustainable development and climate change is complex. Climate change adversely affects the “*key natural and human living conditions and thereby also the basis for social and economic development.*”¹¹³ On the other hand, certain policy choices and priorities on development processes influence the scale of environmental degradation and consumption of natural resources, and most importantly the level of

¹¹¹ The figure is retrieved from the website of Live Green! Initiative of Iowa State University of Science and Technology. Available at <https://www.livegreen.iastate.edu/take-action/resources/3-facets-in-practice>

¹¹² Flint, R.W. (2013), p.34

¹¹³ Metz, B. et.al. (Eds.). (2007). Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III (WGIII) to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (AR4) Chapter 2 Framing Issues, p.121

GHG emissions that is causing climate change.¹¹⁴ To illustrate, the policy choice of transition to a low-carbon economy that is based on clean energy resources would reduce the GHG emissions contributing to mitigation by time and reduce the impacts of climate change on natural and human systems; however, there may be immediate additional costs of production resulting from green energy technologies that the businesses are not willing to bear at once. The other way around, the reliance on carbon-intensive energy production for economies would keep the costs of production low; however, in the long run, the adverse effects of climate change would damage the production systems, societies and environment so that the development process is in any case interrupted.

Being aware of the dual relationship between sustainable development and climate change and the global scale of consequences attached to that, the national governments around the world recognized the need for global cooperation and partnerships in order to systemize the development policies and actions in a sustainable manner, so that sustainable development becomes a worldwide vision to be monitored through the achievement of clear goals and indicators. In this regard, in 2000, the UN Millennium Summit resulted in the adoption of eight development goals to be achieved by 2015, known as millennium development goals (MDGs), with twenty one targets and sixty indicators for measuring the progress of poverty eradication in all its forms between the years 1990 and 2015.¹¹⁵ The scope of the MDGs ranged from poverty reduction, universal primary education to environmental sustainability. In 15-year time frame, the international community showed profound progress towards the achievement of this global development framework; however, the big gaps between the poorest and the richest as well as between rural and urban areas, poverty and hunger, gender inequality, conflicts, climate change and environmental degradation still persisted around the world.¹¹⁶ The work was not complete and sustainable development was still the core urgent priority for the international community. For this reason, in 2012, at the UN Conference on Sustainable Development, Rio+20, in Brazil, the member states projected the need for the continuation of basic premises of MDGs commitments in the

¹¹⁴ Ibid.

¹¹⁵ UNICEF. (2014). Millennium Development Goals (MDG) Monitoring, paras. 1-2

¹¹⁶ United Nations. (2015). *The Millennium Development Goals Report 2015* Summary, p.7

next decades, and therefore agreed to launch a process for the development of updated and more detailed set of goals to be followed after 2015 and adopted ground-breaking guidelines on green economy policies in the outcome document of the Conference, *the Future We Want*.

In September 2015, the UN Sustainable Development Summit in New York adopted the 2030 Agenda for Sustainable Development, the new *plan of action for people, planet and prosperity*¹¹⁷ to be implemented over the next 15 years. The 2030 Agenda includes 17 universal sustainable development goals (SDGs), 169 targets and 230 indicators as a more detailed, extensive and ambitious follow-up to the previous MDGs framework, in order to mainstream a global vision of sustainable development so that to eradicate poverty and transform our shared planet into a just, equitable and inclusive world.

In the next two subsections, we will firstly address the 2030 Agenda for Sustainable Development through the examination of the SDGs Framework with a focus on the six selected SDGs that fit the purposes of this thesis: No poverty (SDG1), Zero hunger (SDG2), Good health and wellbeing (SDG3), Clean water and sanitation (SDG6), Climate action (SDG13) and Life on land (SDG15); and later the adverse impacts of climate change on the fulfillment of the six aforementioned global goals.

2.3.1. The Sustainable Development Goals (SDGs)

The 17 Sustainable Development Goals, illustrated by the schema in Figure 7, are the first and foremost part of the 2030 Agenda for Sustainable Development, and they officially came into force on 1 January, 2016. While the SDGs Framework is not legally binding, the world governments pledged to achieve the global goals by 2030, through their sustainable development policies, plans and programs, mobilization of resources, national frameworks for the implementation, national monitoring and follow-up mechanisms. The SDGs are universal, transformative and indivisible, and they comprise the three dimensions of sustainable development: *plan of action for people* (society), *planet* (environment) and *prosperity* (economy); and each goal covers a specific theme that is related to three dimensions of sustainable development.

¹¹⁷ United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development* A/RES/70/1, p.1



Figure 7. The 17 Sustainable Development Goals ¹¹⁸

To begin with, SDG 1 principally aims at *eradicating extreme poverty for all people everywhere* and *reducing at least by half the proportion of men, women, and children of all ages living in poverty in all its dimensions*.¹¹⁹ In this regard, the extreme poverty is measured as living less than \$1.90 per day that is the international poverty line last updated in 2015. Poverty, however, is much more than the lack of income and resources, therefore the several manifestations of poverty such as hunger, malnutrition, and limited access to education, health and other basic services are included in the scope of the goal.¹²⁰ Secondly, SDG 2 aspires to *end hunger, achieve food security and improved nutrition and promote sustainable agriculture*¹²¹, in particular for the poor and people in vulnerable situations. This requires to ensure access to safe, nutritious and sufficient food for everyone, and to work on the sustainable food production systems and agricultural productivity around the globe. Therefore, the sectors of agriculture, forestry and fisheries are central for hunger and poverty eradication, and if the global food and agriculture system is managed properly; they can nourish today’s 815 million

¹¹⁸ The figure is taken from the UN Sustainable Development web platform.

¹¹⁹ United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development* A/RES/70/1, p.17

¹²⁰ United Nations.(n.d.) Goal 1: End poverty in all its forms everywhere, para. 2

¹²¹ United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development* A/RES/70/1, p.17

hungry and the additional 2 billion people expected by 2050.¹²² Thirdly, SDG 3 intends to *ensure healthy lives and promote well-being for all at all ages*.¹²³ The specific targets of the goal include the reduction of global premature, neonatal, child, and maternal mortality ratios, the termination of epidemics of AIDS, malaria and tuberculosis as well as the other water-borne, vector-borne and tropical diseases, and the achievement of universal health coverage including reproductive and sexual health, and access to quality essential health-care services, medicines and vaccines for all.¹²⁴ Moreover, briefly stated, SDG 4 concentrates on *ensuring inclusive and equitable quality education for all*¹²⁵ and SDG 5 focuses on the gender equality and empowerment of women and girls.¹²⁶

SDG 6 seeks to *ensure access to water and sanitation for all*.¹²⁷ The targets of the goal comprise the achievement of universal and equitable access to safe and affordable drinking water as well as access to adequate and equitable sanitation and hygiene for all, improvement of water quality, the management and restoration of water-related ecosystems.¹²⁸ Moreover, the adverse impacts of water scarcity, poor water quality and inadequate sanitation on food security, livelihoods and health are recognized and interconnected to the other SDGs targets within the framework. In short course, SDG 7 targets *to ensure access to affordable, reliable, sustainable and modern energy for all*¹²⁹, SDG 8 addresses the promotion of *inclusive and sustainable economic growth, employment and decent work for all*¹³⁰, SDG 9 centers upon *building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation*¹³¹, SDG 10 seeks to *reduce inequality within and among countries*¹³², SDG 11 aims for *making cities inclusive, safe, resilient and sustainable*¹³³, and SDG 12

¹²² United Nations.(n.d.) Goal 2:End hunger, achieve food security and improved nutrition and promote sustainable agriculture, paras. 2-5

¹²³ United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development* A/RES/70/1, p.18

¹²⁴ Ibid.

¹²⁵ Ibid., p.19

¹²⁶ Ibid., p.20

¹²⁷ Ibid., p.20

¹²⁸ Ibid., pp.20-21

¹²⁹ Ibid., p.21

¹³⁰ Ibid.

¹³¹ Ibid., p.22

¹³² Ibid., p.23

¹³³ Ibid., p.24

aspires to *ensure sustainable consumption and production patterns*.¹³⁴ Furthermore, SDG 13 calls for *taking urgent action to combat climate change and its impacts**¹³⁵ and it has an asterisk in order to acknowledge that the UNFCCC is the primary international, intergovernmental forum for negotiating the global response to climate change even though SDGs Framework includes commitments for climate action. The targets of the goal consist of strengthening resilience and adaptive capacities in all countries, integrating climate change measures into national policymaking, improving education, awareness raising and capacities on mitigation, adaptation, impact reduction and early warning, and climate finance.¹³⁶ Besides, SDG 14 focuses on the *conservation and sustainable use of the oceans, seas, and marine resources*.¹³⁷ In addition, SDG 15 aims at the *sustainable use of terrestrial ecosystems, combating desertification, halting and reversing land degradation, halting biodiversity loss*.¹³⁸ The targets of the goal incorporates the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems, in particular forests, wetlands, mountains and dry lands, as well as the conservation of their biodiversity, the promotion of afforestation and reforestation globally, restoring degraded land and soil, reducing the degradation of natural habitats, and protection of the threatened species.¹³⁹ Lastly, SDG 16 aspires to the *promotion of just, peaceful and inclusive societies*¹⁴⁰ and SDG 17 seeks to *revitalize the global partnership for sustainable development*¹⁴¹ in all aspects.

The ambitious commitments of the world governments and the multi-stakeholder partnership approach including public and private sectors and civil society are promising for the achievement of SDGs by 2030; however, as mentioned before, the climate change and its symptoms are posing a serious challenge along with the other factors, for the accomplishment of 2030 Agenda. We will now address how climate change interferes with the road to successful implementation of SDGs framework.

¹³⁴ Ibid.

¹³⁵ Ibid., p.25

¹³⁶ Ibid.

¹³⁷ Ibid., p.26

¹³⁸ Ibid., p.27

¹³⁹ Ibid.

¹⁴⁰ Ibid., p.28

¹⁴¹ Ibid.

2.3.2 The Implications of Climate Change on the 2030 Agenda

Climate change is an inevitable and urgent global challenge with long-term implications for the sustainable development of all countries¹⁴², especially that of the poorest and the most vulnerable. One of the key international frameworks that are employed to evaluate the interconnection between climate change and sustainable development is the 17 SDGs of the 2030 Agenda. For the purposes of this study, we will concentrate on the aforementioned six SDGs in order to evaluate the impacts and link of climate change on the achievement of those SDGs.

To begin with, the climate change impacts are projected to slow down economic growth, make poverty reduction more difficult, further erode food security, and prolong existing and create new poverty traps¹⁴³ in the developing countries, which is directly linked to SDG 1 and its specific targets. Numerous studies¹⁴⁴ show that higher temperatures and climate extremes are to “*reduce agricultural output, industrial output and aggregate investment*”¹⁴⁵ and therefore to affect the incomes of the households, and the national economies, which relates to the economic dimension of poverty. For example, extreme events such as hurricanes, droughts, and floods interrupt the economic activity through direct damages to business properties, products or production systems, including agricultural sector and industries. The socio-economic dimensions of poverty are also indirectly influenced by climate change, through the food-related, health-related and water-related impacts that are examined more in detail with regard to the specific SDGs devoted to them. To briefly illustrate, the impacts of climate change on the agricultural sector together with the climate extreme events have broad implications for the manifestation of poverty in all its dimensions: the reduced agricultural outputs increasing prices, and the reduced nutritious values of food products all relate to food insecurity; the health-related impacts may range from malnutrition or under nutrition to prevalence of water-borne or vector-borne diseases that heightened by the warming, heavy rainfall, flooding, and the consequences of climate change on water

¹⁴² Matthew, R.A. & Hammill, A. (2009). Sustainable Development and Climate Change. *International Affairs*, 85(6), p.1117

¹⁴³ IPCC AR5 Contribution of WG II, Summary for Policymakers, p.20

¹⁴⁴ See Dell, M. et.al. (2008), Arndt, C. et.al. (2012), IPCC AR5 (2014) Contribution of WG II, and OECD (2015) The Economic Consequences of Climate Change.

¹⁴⁵ Dell, M. et.al. (2008). Climate Change and Economic Growth: Evidence from the last half century. *National Bureau of Economic Research (NBER) Working Paper Series*, Paper no: 14132, p.3

scarcity, quality and sanitation reflect on poverty manifestation as well. In this regard, the challenges posed by climate change are explicitly recognized within SDG1 through the target of building resilience and reducing exposure and vulnerability to climate-related extreme events and disasters.

Secondly, the vulnerability and exposure of agricultural, livestock and fishery industries to climate change impacts negatively affects the food production and therefore threatens the food security, and may pave the way for chronic hunger crisis. This directly relates to SDG 2 that aims for ending hunger and ensuring food security by 2030. To illustrate, the high rainfall variability and prolonged dry spells in sub-Saharan Africa may result in crop failures since the agricultural activities are mostly rain-fed and nature-dependent. The untimely or scarce precipitation impairs the growth patterns of certain agricultural products so that the crop failures occur, therefore those food products are not sufficiently provided and served in the market, this increases the prices for those products and at the end, and both availability and accessibility aspects of food security are endangered. Moreover, extremes such as storms or flooding may simply destroy the plantations and lead to almost zero harvest, which affects both the producers and the consumers. Acknowledging the negative impacts of climate change on agricultural production and food security, SDG 2 contains a specific target on sustainable and resilient production systems, and capacity for adaptation to climate change and extreme weather events.

Thirdly, the health-related climate change impacts endanger the achievement of SDG 3 good health and wellbeing. The climate-related extremes such as hurricanes and floods may directly threaten the human lives in certain cases. Moreover, the warming air temperatures together with air pollution increase the incidents of cardiovascular and respiratory health problems, and lead to more favorable conditions for the reproduction of certain types of microorganisms, such as plasmodium parasites that cause malaria. Furthermore, the heavy precipitation and flooding may spread the contaminants in the air and water or destroy drainage and sewer systems that drinking water and surface water resources become further contaminated with pathogens, so that the risks for water-borne diseases increase. In this regard, the specific targets of SDG 3, such as ending the epidemics of malaria and water-borne diseases and reducing the number of

deaths and illnesses that result from air-water pollution or contamination, become more difficult to be realized.

Fourthly, the climate-related events such as floods and droughts will affect water supply, water quality and sanitation conditions¹⁴⁶ that are in connection with the scope of SDG 6. For example, due to the increasing temperatures, evaporation and reduced precipitation, the surface water and groundwater resources will decrease in some regions of the world, which affects the potential for water scarcity in presently dry places, increasing the water stress. Moreover, the warmer temperatures may change the properties of water, and the heavy precipitation and floods concordantly will pollute the water resources further, which decrease the quality of water for drinking and domestic use. Accordingly, the projected water scarcity and pollution will have profound effects on personal hygiene and sanitation facilities. All these estimated impacts on water cycle will hinder the achievement of the targets on safe drinking water, adequate hygiene and sanitation conditions, and improving water quality through reducing pollution.

Fifthly, the 2030 Agenda dedicates a separate goal for dealing with climate change, SDG 13. The goal explicitly recognizes that climate change is posing, and will pose, a challenge for the global sustainable development, and underlines the necessity for global action on adaptation, mitigation and disaster risk reduction measures for resilience against climate change and climate-related hazards. Therefore, the commitment to an ambitious climate action in line with the Paris Agreement of 2015 is the prerequisite in order to endure climate change on the road to the achievement of the rest of the 2030 Agenda items, therefore clearing the way for developing with climate change. Lastly, climate change contributes to degradation of ecosystems, desertification, land degradation and biodiversity loss, which leads us to the scope of SDG 15 life on land. To illustrate, the rising sea levels in low-lying coastal areas threaten the wetlands and river delta ecosystems¹⁴⁷, and in the long run, will result in complete land cover loss on coastlines. Moreover, the global warming and climate-related hazards combined with human activities on land affect the natural habitats of fauna and flora species, and when certain species are unable to adapt to an altered environment or shift their habitats, they

¹⁴⁶ Ansuategi, A. et.al. (2015). The impact of climate change on the achievement of the post-2015 sustainable development goals. Climate and Development Knowledge Network(CDKN), p.48

¹⁴⁷ Huq, S. et.al. (2015). Impact of climate change on least developed countries: Are SDGs possible?, p.3

are at increased risk of extinction.¹⁴⁸ Therefore, the fulfillment of the specific targets of SDG 15 for the conservation, restoration and sustainable use of terrestrial ecosystems, preservation of natural habitats, and prevention of biodiversity loss is further threatened by the adverse impacts of climate change in the absence of comprehensive action plans and policies.

In short, climate change and its symptoms hamper the global capability to achieve the 17 SDGs by 2030 unless the appropriate adaptation, mitigation and risk reduction commitments are employed globally. The level of interference of climate change on the global sustainable development agenda will be the highest for the poorest and the most vulnerable countries where the factors of poverty, food insecurity and water stress are still prevalent. After the close examination of sustainable development and the SDGs framework in relation to climate change, we will now address the post-2015 agenda with a holistic approach through the integration of climate change, disaster risk, human rights and sustainable development paradigms in the global arena.

2.4 Climate Change, Disaster Risk, Sustainable Development and Human Rights: Coordination and Engagement

Today's global governance agenda has been determined by the year 2015 since three separate international forums on disaster risk, sustainable development and climate change were convened in 2015, and these forums have led to the emergence of three landmark documents that jointly compose and regulate the post-2015 global agenda with an integrated perspective since then¹⁴⁹:

- Sendai Framework for Disaster Risk Reduction 2015-2030 (March 2015)
- The 2030 Agenda for Sustainable Development and 17 SDGs (September 2015)
- The Paris Agreement (December 2015)

¹⁴⁸ Matthew, R.A. & Hammill, A. (2009), p.1125

¹⁴⁹ UN Climate Change Secretariat. (2017). Technical Paper: Opportunities and options for integrating climate change adaptation with the sustainable development goals and the Sendai framework for disaster risk reduction 2015-2030, p.5

From the perspective of global climate change governance, adaptation is directly connected to SDG and DRR paradigms, rather than mitigation. Presented in Figure 8, the idea of enhancing resilience through capacity building and vulnerability reduction is the connecting factor for these agendas.

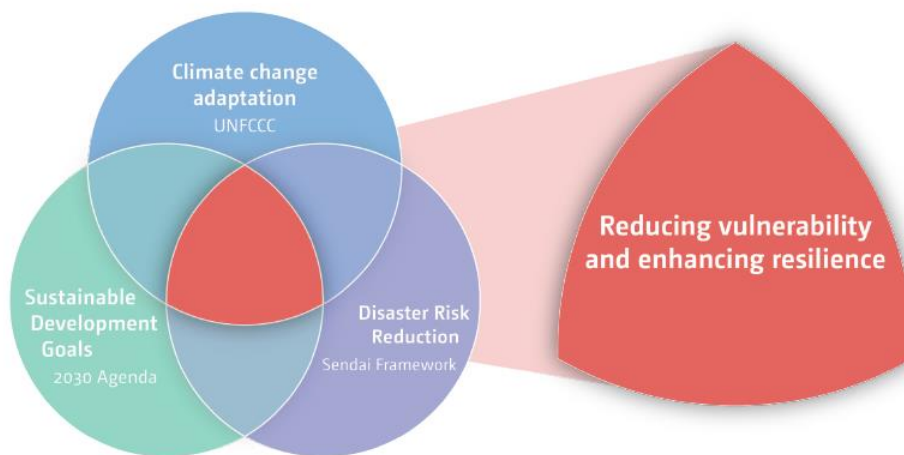


Figure 8. Integrating Climate Change Adaptation with the SDGs and DRR¹⁵⁰

To begin with, Sendai Framework being chronologically the first mechanism among the three, explicitly refers to the challenges posed by climate change and “*highlights the role that climate change plays as a key driver of disaster risk, as well as the ability of adaptation and resilience-building to reduce disaster risk and achieve sustainable development*”.¹⁵¹ The priority area number three of the framework is completely devoted to enhancing resilience through disaster risk reduction.¹⁵² Secondly, the SDGs of 2030 Agenda show a clear link primarily through SDG 13 on climate action, calling for strengthening resilience and adaptive capacity to climate-related hazards and natural disasters, and mention early warnings.¹⁵³ Moreover, several other SDGs, the ones regarding poverty (SDG 1), hunger (SDG 2), health (SDG 3), and life on land (SDG 15) also mention resilience building within their scopes in the form of resilience of the poor and those in vulnerable situations, reducing exposure and vulnerability to climate-related extremes and disasters, resilient agricultural practices, early warning and risk

¹⁵⁰ The figure is retrieved from UN Climate Change Secretariat. (2017). Technical Paper: Opportunities and options for integrating climate change adaptation with the sustainable development goals and the Sendai framework for disaster risk reduction 2015-2030, p.5

¹⁵¹ Ibid., p.12

¹⁵² See more on Sendai Framework for Disaster Risk Reduction (2015), paras 29-31

¹⁵³ United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development* A/RES/70/1, p.25

reduction for health risks, and resilience of ecosystems. Thirdly, the Paris Agreement addresses the global goal on “*enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development*”¹⁵⁴, and recognizes the importance of early warning systems, emergency preparedness, comprehensive risk assessment and management, and resilience of communities, livelihoods and ecosystems.¹⁵⁵ Given the centrality, common themes and objectives of the three global agendas in the post-2015 era, many countries and other actors have expressed an interest in pursuing integrated approaches to adaptation, sustainable development and disaster risk reduction.¹⁵⁶ The global stance on the level of integration of three frameworks revolves around a *partial but robust integration model* that recognizes the core alignments among the agendas whilst distinguishing the specific formulations, distinct processes with different actors and legal frameworks that the agendas operate in.¹⁵⁷ At this juncture, it is important to bear in mind that the core concept of resilience is treated through a different viewpoint in each of the frameworks depending on the context, sectors or scales. For instance, while the Sendai Framework centers upon anticipatory and absorptive capacity building for resilience in dealing with climate and natural shocks and stresses, the SDGs framework highlights the adaptive capacity, anticipatory adaptation and institutional capacity for poverty reduction and vulnerability together with climate-related hazards, and the Paris Agreement naturally elaborates on the adaptive capacity to climate change.¹⁵⁸ Moreover, the scopes of the agendas are divergent; the SDGs framework being more comprehensive and broader in terms of issues tackled compared the other two instruments. Nevertheless, when *taken together, the different approaches and contributions of these frameworks make for a more complete ‘resilience agenda’*¹⁵⁹ in the post-2015 global governance scenario.

The coordination and engagement of the three agendas ensures complementarities between the actions that are undertaken as a part of each agenda so that the contradictions that may undermine the progress are eliminated, thus enhances efficiency

¹⁵⁴ Article 7 (1) of Paris Agreement (2015)

¹⁵⁵ Article 8 (4) of Paris Agreement (2015)

¹⁵⁶ UN Climate Change Secretariat. (2017). Technical Paper, p.9

¹⁵⁷ Ibid., pp.9-10

¹⁵⁸ Peters, K. et.al. (2016). ‘Resilience’ Across the Post-2015 Frameworks: Towards Coherence? Working Paper, p.42

¹⁵⁹ Ibid., p.14

and achievability of each framework, eases the monitoring and follow-up processes and provides for a comprehensive assessment of progress in the post-2015 global development agenda.¹⁶⁰

While the three post-2015 global agendas engage and coordinate with one another, yet another unique common ground they share is that, they are guided by the purposes and principles of the international human rights paradigm since the motto of “*human rights and fundamental freedoms for all*” is the oldest and most deeply-rooted aspiration compared to the three agendas for the international community with regard to human dignity and prosperity. All the three documents explicitly refer to respect, protection, promotion and fulfillment of all human rights and principles; however, the degree of relevance with human rights is different for each agenda. Firstly, in the Sendai Framework, the guiding principles contains the promotion and protection of all human rights, including the right to development, along with a mention on non-discrimination principle and maintaining a gender, age, disability and cultural perspective.¹⁶¹ Secondly, the Paris Agreement clearly acknowledges that when taking an action to climate change, the state parties should “*respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity.*”¹⁶² Lastly, among the three agendas, the 2030 Agenda with the SDGs is the most relevant framework to the human rights discourse. The 2030 Agenda in its vision envisages a world of universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination.¹⁶³ Indeed, the motto of the 2030 Agenda “*leaving no one behind*” reflects the embodiment of principles of justice, equality and nondiscrimination. Moreover, it openly states that the new 2030 Agenda is grounded in the Universal Declaration of Human Rights and international human rights treaties and reaffirms the state responsibilities to respect, protect and promote human

¹⁶⁰ UN Climate Change Secretariat. (2017). Technical Paper, pp.10-11

¹⁶¹ Sendai Framework for Disaster Risk Reduction (2015), para 19(c,d)

¹⁶² Preamble of Paris Agreement (2015), para.11

¹⁶³United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development* A/RES/70/1, p.5

rights and fundamental freedoms for all.¹⁶⁴ Furthermore, within the agenda, 17 SDGs and 169 targets cover a wide range of issues that resemble the content of international human rights framework, and several SDGs and their targets directly correspond to specific human rights standards that especially relate to the economic, social and cultural rights.¹⁶⁵ For instance, at a glance, the six SDGs that we examined in detailed in the previous sections either directly reflects or partially relates to several human rights and their instruments:¹⁶⁶

- SDG 1 relates to the right to an adequate standard of living (Article 11 of ICESCR) and right to social security (Article 9 of ICESCR)
- SDG 2 effectively mirrors the right to adequate food (Article 11 of ICESCR), and links up with right to life (Article 6 of ICCPR) and right to health (Article 12 of ICESCR)
- SDG 3 directly reflects the right to health, and is associated with right to life
- SDG 6 clearly resembles the right to safe and drinking water and sanitation (Article 11 of ICESCR), and is connected with right to health
- Both SDG 13 and SDG 15 regard to right to health including the right to safe, clean, healthy and sustainable environment, right to adequate food and right to safe drinking water

In a more detailed manner, the targets of these SDGs are also associated with the corresponding regulations of more specific human rights instruments -such as the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW) (1979) and the Convention on the Rights of the Child (CRC) (1989) - since the SDGs framework employs a gender and age perspective. In this regard, the comprehensive and detailed database of the Danish Institute for Human Rights, named Human Rights Guide to Sustainable Development Goals, associates 156 of the 169 SDG targets (92%) with the international and regional human rights instruments and working standards.¹⁶⁷ For example, the specific targets on reproductive and sexual health as well as child mortality of SDG 3 are also associated with Article 12 of CEDAW on women's

¹⁶⁴ Ibid., p.6

¹⁶⁵ OHCHR. (n.d.). Human Rights and the 2030 Agenda, p.1

¹⁶⁶ Compiled from OHCHR. (n.d.). Summary table on the linkages between the SDGs and relevant international human rights instruments, pp.1-5

¹⁶⁷ For more information and to access the database, please visit www.sdg.humanrights.dk

health, as well as the Articles 6 and 24 of CRC on right of the child to life and to the enjoyment of the highest attainable standard of health respectively.¹⁶⁸ The association of the SDGs framework with the human rights can pave the way to keep SDGs on task, bringing power to their promise.¹⁶⁹ This also creates operational opportunities for pursuing integrated approaches to implementation, monitoring and accountability given the fact that human rights are legally binding and enforceable while the SDGs are built upon a voluntary and non-binding basis.¹⁷⁰

All in all, the synergy among the three frameworks to foster sustainable development, climate change action and disaster risk governance creates an integral scale for the evaluation and accomplishment of the post-2015 global agenda through their distinctive interpretations and practices on the common purpose of resilience. The fact that the three agendas base their origins on and interrelate to the premises of the international human rights discourse empowers and legitimizes their positions and assertions, and as well reiterates the substantiality of human rights in the global system.

After the second chapter encapsulated the trio of climate change, human rights and sustainable development through the examination of human rights and climate change relationship, of the sustainable development paradigm and the SDGs Framework with regard to climate change, and lastly gathered the four paradigms examined in this thesis -climate change, human rights, disaster risk and sustainable development- under the roof of the concept of resilience; in the third chapter, we will put the core paradigms of this work –that have been examined so far at a global level- into multi-level governance practice through a detailed case study from Uganda, which incorporates the interplay among international, regional, national and local level mechanisms on climate change adaptation, disaster risk reduction and sustainable development in the specific local context of Karamoja.

¹⁶⁸ Retrieved from the Database Human Rights Guide to Sustainable Development Goals of the Danish Institute for Human Rights (DIHR).

¹⁶⁹ Wagner, J (Auth.) & Sattelberger, J. (Ed.). (2017). How does the 2030 Agenda relate to human rights?, KfW Development Brief.

¹⁷⁰ Ibid. ; DIHR. (2018). Human Rights and the 2030 Agenda For Sustainable Development, p.6

3. THE CASE STUDY: CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION IN KARAMOJA

The last chapter of this thesis is devoted to the case study that centers upon the region of Karamoja in Uganda, in order to illustrate how climate change adaptation and disaster risk reduction paradigms interplay in a particularly vulnerable context in pursuit of community resilience and sustainable development. In addition to the desk research, the field search data is utilized throughout the chapter, and the field research was conducted between 25th February 2018 and 18th March 2018 in Nabilatuk and Lolachat sub-counties¹⁷¹ of Nakapiripirit District¹⁷² in Karamoja under the supervision of Ecological Christian Organization (ECO) Nabilatuk Field Office. In this regard, we examined the ECO Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Karamoja, and the project constitutes the focal point with a community-level analysis within the case study of this thesis. In the process of field research, the participatory ethnographic data collection techniques have been employed, including participant observation, interview¹⁷³, focus group discussions and audio-visual tools. The focus group discussions have been organized and performed as semi-structured through the open-ended questions that facilitated the discussions and brought about comparative, informative, and interpretive information on the ECO projects in three specific villages: Napayan, Nathinyonoit(A)¹⁷⁴ and Namidikao in Nakapiripirit District. In this regard, the focus groups in each village have been composed of 10-12 people, all of whom are farmers and pastoralists. Moreover, during the selection of participants, we have taken into account the equal numeric representation of men and women as well as elderly and youth. There have been five questions employed in the semi-structured focus group discussions, listed in Table 1.

¹⁷¹ Sub-county is the fifth level administrative unit in Ugandan administrative divisions.

¹⁷² District is the third level administrative unit in Ugandan administrative divisions.

¹⁷³ The interview was done with health center nurse/midwife in the Health Center of Nabilatuk in March 2018.

¹⁷⁴ Nathinyonoit village has been divided into two intervention areas by ECO Nabilatuk Field Office, and they are identified as Nathinyonoit (A) and Nathinyonoit (B).

Focus Group Discussion Facilitating Questions
1. Do you see changes in the climate/weather patterns compared to the previous years? If yes, what changes?
2. How do these changes affect your livelihoods?
3. How do you respond to these effects?
4. How do the ECO interventions affect your before-after conditions with regard to the climate change adaptation and disaster risk reduction? You can reflect on positive and negative effects or no effect.
5. What are the risks and challenges you encounter in the implementation and outcomes of the project interventions?

Table 1. Focus Group Discussion Facilitating Questions ¹⁷⁵

The choice of participatory and community-based approaches allowed us to bring in an important additional commitment to respect local knowledge and facilitate local ownership and control of data generation and analysis.¹⁷⁶ Moreover, the analysis of this case study follows a multi-level governance model that is embedded throughout the organization of the chapter.

In this regard, the analysis will commence with the country background of Uganda, pointing out the particular socio-economic vulnerabilities and climate change impacts in the country. Later, Uganda's climate change, disaster risk and sustainable development agendas will be examined through the interplay between the country's international and regional commitments and Ugandan national policy instruments, focusing on the national level. After that, we will direct the attention to a regional level analysis within Uganda through the region of Karamoja, addressing the geographic, climatic and socio-economic characteristics together with the symptoms of climate change prevalent in the region. Thereupon, the local and community level analysis will be carried out through the ECO Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Nakapiripirit District with a focus on the abovementioned three villages. At this juncture, we will first introduce ECO and its work, examine the project and its project interventions, and reflect on the project interventions in the context of each village separately. Then, the impact assessment of ECO interventions will be noted and the

¹⁷⁵ The table is author's own work.

¹⁷⁶ Garbarino, S. & Holland, J. (2009). Quantitative and Qualitative Methods in Impact Evaluation and Measuring Results, p.7

findings in three villages will be displayed. Afterwards, we will connect the contents and scopes of ECO interventions coupled with the findings from the impact assessment to the nexus of SDGs and human rights standards that we elaborated in this thesis. Lastly, we will take a prospective stand and look beyond the current phases of the ECO CPESDRR project life cycle through the evaluation of the exit strategies in a going-forward basis.

3.1 Country Background: Uganda

Uganda is a land-locked country located in sub-Saharan Africa, precisely in East Africa, neighboring to Kenya, Tanzania, South Sudan and Democratic Republic of Congo and Rwanda; and *although situated close to the equator, it has diverse climate patterns due to the country's unique bio-physical characteristics affected by large bodies of water (lakes and rivers), wind patterns and mountain ranges,*¹⁷⁷ therefore, the climate conditions, vegetations and distribution of resources are divergent across the country. In connection to this, natural resources constitute the primary source of livelihood for the majority of Ugandans since the agriculture and livestock sectors are the backbones of the Uganda's economy.¹⁷⁸ The agricultural activities in Uganda, as in most developing countries of Africa, are nature-dependent and rain-fed, therefore inherently sensitive to climate conditions and one of the most vulnerable sectors to climate change and its impacts. As a matter of fact, climate change already threatens *the hard-won economic and social development trajectories* as well as *poverty eradication goals* of the country.¹⁷⁹ When it comes to climate risk and resilience analysis, Uganda is generally considered as one of the most vulnerable and unprepared countries as well as having one of the least adaptive capacity in the world. In this regard, it is important to point out that there are number of non-climate stressors and indicators that add to the level of vulnerability and capacity. For instance, poverty is one of the most prominent underlying stressors for Uganda's high vulnerability and weak capacity. Although the country reduced the share of its citizens living below the international extreme poverty line of US\$1.90 a day from 53.2% in 2006 to 34.6% in 2013, between 2005 and 2009

¹⁷⁷ USAID. (2016). Uganda Climate Change Vulnerability Assessment Report, p.13

¹⁷⁸ Mubiru, D.N. (2010). Climate Change and Adaptation Options in Karamoja, p. 1

¹⁷⁹ Ibid.

for every three Ugandans who were lifted out of poverty, two fell back into poverty¹⁸⁰, signaling a trend of vicious circle of poverty. In parallel with this, Uganda is labeled as one of the world's poorest countries (ranked 165 among 189 countries) in terms of GDP per capita adjusted for purchasing power parity, based on the evaluation of data retrieved from the World Economic Outlook Database 2016 of International Monetary Fund (IMF).¹⁸¹ The other underlying stressors for the high vulnerability and weak capacity cases include the poor physical infrastructure, unfavorable trajectories on education and health spheres and inadequate availability of basic needs such as food and water; and they address some of the non-economic dimensions of poverty. At this juncture, the inclusion of Uganda since 1971 on the list of Least Developed Countries (LDCs) of the UN reflects the acute poverty in all its dimensions in the country since some of the indicators for this categorization concern gross national income (GNI), under-5 child mortality ratio, maternal mortality ratio, percentage of population undernourished, adult literacy rate and secondary school enrollment ratio, share of agriculture, forestry and fisheries in GDP, victims of disasters, and instability of agricultural production.¹⁸²

As a result of warming of up to 1°C during the last century and expected increase in precipitation throughout East Africa, including Uganda¹⁸³, climate change has started to manifest itself through increased intensity and frequency of extreme events such as droughts, floods, landslides and heat waves, as well as retreating glaciers on the mountains such as Rwenzori Mountains in south-western Uganda.¹⁸⁴ The impacts of these manifestations of climate change in Uganda are mainly as follows:¹⁸⁵

- Increased food insecurity and reduced agricultural production resulting from damages on agriculture, husbandry and fishery sectors because of erratic rainfall variability, high intensity of events and droughts,
- Water scarcity due to higher temperatures, evaporation and recurrent droughts leading to stress, and higher demands for water,

¹⁸⁰ World Bank. (2016). The Uganda Poverty Assessment Report 2016, Report No: ACS18391, p.X

¹⁸¹ Gregson, J. (2017). The World's Richest and Poorest Countries. Global Finance Magazine.

¹⁸² Committee on the Development Policy(CDP) & UNDESA. (2015). Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures Second Edition, pp.42-61

¹⁸³ Uganda National Climate Change Policy, 2015, p.3

¹⁸⁴ Ibid.

¹⁸⁵ The following points are compiled from Hepworth, N. & Goulden, M. (2008). Climate Change in Uganda: Understanding the implications and appraising the response, pp.12-13

- Shifts and extension of malaria and waterborne diseases stemming from higher temperatures, heavy precipitation and floods,
- Land degradation, soil erosion and biodiversity loss emanating from increased mean rainfall, higher temperatures and pressure on natural resources,
- Damages to infrastructure, properties and economic activities owing to extreme events.

Given the circumstances and evidences of climate change impacts in the country, Uganda, as a developing African country with economic and social development aspirations, has long recognized the immediate priority of climate change action in order to pursue a sustainable development path as the Government of Uganda has acknowledged that the cost of inaction against climate change is far greater than the cost of adaptation, mitigation and sustainable development actions in the long run. The However, the limitations on country's financial resources, weak institutional capacity and uneven climate change awareness across the institutions posed a significant challenge for the creation of a coherent national response.¹⁸⁶ Thanks to Uganda's commitments and membership to international and regional mechanisms and institutions on climate change action, sustainable development, climate and development finance, such constraints and limitations have been step by step overcome, leading to initial steps for the establishment of national and local mechanisms. We will now address these international, regional and national mechanisms that guide and inspire Uganda's development pathway towards a low carbon, climate resilient and sustainable future.

3.2 Uganda: Climate Change, Disaster Risk and Sustainable Development Agendas

Although Uganda is one of the countries that least contributed to human induced climate change but affected disproportionately, the projections on the GHG emission scenarios of the country show a gradual increase in the next decades if business as usual development model continues. Being aware of the challenges ahead as a developing country, Uganda has taken joint action with the international community, and made commitments to the various mitigation, adaptation and disaster risk and sustainable development mechanisms.

¹⁸⁶ USAID. (2016). Uganda Climate Change Vulnerability Assessment Report, pp. 14-15

At the international level, firstly, Uganda signed and ratified, in 1992 and 1993 respectively, the UNFCCC and became a party to the Convention. As we have seen in the first chapter, UNFCCC employs CBDR principle in terms of obligations and commitments under the Convention, and recognizes the special status of the LDCs by stating that “*the Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.*”¹⁸⁷ Uganda, being on the list of the LCDs since 1971, is treated through the LDCs provisions under UNFCCC. In this regard, the COP7, in 2001, has been a landmark for the LDCs under UNFCCC, with the establishment of the LDC Work Programme, including National Adaptation Programmes of Action (NAPAs).¹⁸⁸ COP 7 also resulted in the establishment of the LDC Fund and LDC Expert Group in order to fund the preparation and implementation of NAPAs and to provide technical support and advice to the LDCs.¹⁸⁹ Moreover, the country has become a party to the Kyoto Protocol through the ratification in 2002. Furthermore, the parties of the Convention, at COP19 in 2013, have signed the notion of “intended nationally determined contribution (INDC)”¹⁹⁰ on global GHG emissions, and in 2015, right ahead of the COP21 in Paris, Uganda pledged to “*an approximately 22% reduction of national green house gas emissions in 2030 compared to business-as-usual.*”¹⁹¹ Lastly, in this regard, Uganda has been one of the first countries to sign and ratify the Paris Agreement 2015 so that committed to the global efforts to reduce GHG emissions and limit the warming to 1.5°C. Secondly, when it comes to disaster risk management, despite the global instruments are based on voluntary commitments with low enforcement mechanisms, Uganda has first joined the international community in Hyogo Framework for Action 2005-2015 and later the Sendai Framework for Disaster Risk Reduction 2015-2030, in order to reduce the disaster losses and enhance resilience. The submission of the national progress report on the implementation of the HFA by the Ugandan Government illustrated the will and efforts of the country for the achievement

¹⁸⁷ Article 4(9) of UNFCCC (1992)

¹⁸⁸ UNFCCC Webpage. (n.d.) National Adaptation Programmes of Action, para.1

¹⁸⁹ Ibid.

¹⁹⁰ INDC is a term used under UNFCCC, defining the pledged voluntary national climate targets of the parties of the Convention on mitigation and adaptation prior to the Paris Agreement 2015, which become a binding nationally determined contribution (NDC) when the country ratifies the Agreement.

¹⁹¹ Uganda Ministry of Water and Environment.(2015). Uganda’s Intended Nationally Determined Contribution (INDC), p.2

of the global agenda on disaster risk management. Thirdly, with regard to sustainable development, in 2000, Uganda first devoted to the MDGs of 2000-2015, and currently is committed to the fulfillment of 17 SDGs by 2030 within the scope of the 2030 Agenda in order to pursue the national aspirations of poverty reduction, economic and social development.

At the regional level, Uganda acts jointly with the African Union in a broader scale and with the East African Community in a more specific way. Firstly, there is the African Union Strategy on Climate Change Draft that illustrates the common position of the African continent on climate change, adaptation, mitigation, and response measures - whilst underlying that adaptation is overriding priority for the continent¹⁹²-, as well as the strategic goals and thematic areas; however, the draft document is pending for the submission to the African Union Commission. Secondly, the strategic framework of the African Union “*Agenda 2063: The Africa we want*” was adopted by the African Union in 2013 for the socio-economic transformation of the continent over the next 50 years.¹⁹³ The Agenda 2063 envisages “*an integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the international arena*”¹⁹⁴, and includes seven aspirations¹⁹⁵ that resonate with the SDGs Framework of the 2030 Agenda. Thirdly, Uganda as a partner state of the East African Community (EAC) follows the Climate Change Policy (2011) of the Community that aims “*to contribute to sustainable development in the region through harmonized and coordinated regional strategies, programmes and actions to address climate change.*”¹⁹⁶ The EAC Climate Change Policy underlines that the adaptation measures are primary¹⁹⁷, and draws attention to the utility of disaster reduction and risk management practices including early warning, preparedness, and emergency response

¹⁹² Draft African Union Strategy on Climate Change.(2014). P, 21

¹⁹³ African Union. (n.d.). What is Agenda 2063?., para. 1

¹⁹⁴ African Union. (2015). *Agenda 2063: the Africa we want* (popular version), p.1

¹⁹⁵ The seven inspirations of Agenda 2063 are: 1. A prosperous Africa based on inclusive growth and sustainable development, 2. An integrated continent, politically united based on the ideals of Pan Africanism and the vision of Africa’s Renaissance, 3. An Africa of good governance, democracy, respect for human rights, justice and the rule of law, 4. A peaceful and secure Africa, 5. An Africa with a strong cultural identity, common heritage, values and ethics, 6. An Africa, whose development is people-driven, relying on the potential of African people, especially its women and youth, and caring for children, 7. Africa as a strong, united, resilient and influential global player and partner. For more details, see African Union. (2015). *Agenda 2063: the Africa we want* (popular version), pp.2-10

¹⁹⁶ East African Community Climate Change Policy, p.4

¹⁹⁷ Ibid., p.5

as an adaptation method in the region.¹⁹⁸ Following this, the EAC developed the Climate Change Strategy (2011/12-2015/2016) and Climate Change Master Plan (2013-2033) in order to effectively guide and monitor the implementation of the Climate Change Policy. As it is seen, with regard to the agendas of climate change, disaster risk, and sustainable development, Uganda has a great number of commitments, aspirations and obligations at the international and regional levels, which have been translated and incorporated into several national mechanisms.

At the national, level, firstly, Uganda National Adaptation Programme of Action (NAPA) was completed and submitted to UNFCCC due to Uganda's commitments under the LDC Work Programme in 2007. Uganda's NAPA examines the impacts of climate change on the country's development in detail, and provides guidance for the identification of urgent and immediate adaptation needs, therefore the priorities, and the allocation of resources among the adaptation options and policies available for the country. In this regard, the instrument determines eight prioritized climate change adaptation intervention areas, nine specific projects¹⁹⁹ incorporating the priorities, and also identifies the coping strategies employed by the rural communities of Uganda. The eight prioritized intervention areas are ranked as follows:²⁰⁰

1. Land and land use
2. Farm forestry
3. Water resources
4. Health (including sanitation)
5. Weather and climate information
6. Indigenous knowledge documentation and awareness creation
7. Policy and legislation
8. Infrastructure

¹⁹⁸ Ibid., p.7

¹⁹⁹ The nine projects are listed as: Land Degradation Management Project, Community Tree Growing Project, Community Water and Sanitation Project, Water for Production Project, Drought Adaptation Project, Vectors, Pests and Disease Control Project, Strengthening Meteorological Services Project, Indigenous Knowledge (IK) and Natural Resources Management Project, Climate Change and Development Planning Project. For more information, see: Uganda NAPA (2007), pp.51-66

²⁰⁰ Uganda NAPA (2007), p.XVI

Corresponding to the priority areas and the projects, the most relevant coping strategies identified in the rural communities in Uganda are:²⁰¹

- Alternative livelihood systems (may include unsustainable activities)
- Food preservation (e.g. storing after sun drying and smoking)
- Under-utilized and drought-resilient foodstuffs (e.g. cassava²⁰², sorghum²⁰³)
- Soil and land conservation (e.g. tree-planting, grass cover)
- Water harvesting (open and underground water reservoirs)
- Hygiene and sanitation activities
- Indigenous knowledge and local disaster management committees

Secondly, in 2013, the country launched the Uganda Vision 2040 that envisages the transformation of the Ugandan society from a peasant to a modern and prosperous country by 2040.²⁰⁴ The Vision 2040 includes seven aspirations²⁰⁵ and their specific targets that are in harmony with the SDGs framework. For instance, some of specific targets relate to the reduction of the ratio of people living below the poverty line and that of maternal and child mortality, and increasing the percentage of population with access to clean water,²⁰⁶ which have direct correspondence with the SDG1, SDG3, and SDG6. Moreover, the Vision 2040 recognizes the economic, social and environmental challenges to Uganda's development and addresses the adverse impacts of climate change on the development processes. Therefore, the instrument integrates climate change adaptation and mitigation into the national development aspirations, and provides guidance for the Ugandan commitment to the post-2015 global sustainable development agenda. Thirdly, in 2015, the Government of Uganda finalized and put into practice the National Climate Change Policy (2015) that based upon climate change adaptation; mitigation; and research and observation as priority concerns. In accordance

²⁰¹ Ibid., pp.41-43

²⁰² Cassava is a vegetable that is the starchy tuberous root of a tropical tree called shrubby tree, and grown and used as food in tropical countries.

²⁰³ Sorghum is a cereal that is a major source of grain and stockfeed grown in the warm regions of the world.

²⁰⁴ The vision statement of the Uganda Vision 2040.

²⁰⁵ The seven aspirations in short are: 1. A peaceful, secure, harmonious and stable country and at peace with its neighbors, 2. Equal opportunities irrespective of gender, age, tribe, ethnicity or religion, 3. Prosperity and economic development, 4. Affordable quality health and education services and free of hunger, 5. Modern infrastructure, clean energy and industrialization, 6. A green economy and clean environment, and 7. Moral and ethical society. For more information, see Uganda Vision 2040, pp.9-10

²⁰⁶ Uganda Vision 2040, pp.13-16

with the EAC regional policy, Ugandan national policy also identifies “*climate change adaptation as the top priority for Uganda, while mitigation efforts are embraced by the policy as secondary, given Uganda’s stage in the development process and its current low levels of emissions.*”²⁰⁷ Moreover, the Ugandan policy underlines the importance of the promotion of participatory bottom-up approaches to adaptation policies and specifically points out “community-based adaptation” within the scope of its guiding principles.²⁰⁸ Furthermore, the sector-specific and cross-cutting policy priority areas for adaptation and mitigation are outlined in the document. The priority areas include agriculture and livestock, water, forestry, biodiversity and ecosystem services, health, energy, physical and social infrastructure, and disaster risk management;²⁰⁹ and attach specific importance to the resilience of vulnerable groups. Lastly, the Parliament of Uganda is currently in preparation for the enactment of a law on climate change, and the Draft National Climate Change Bill is completed by the Parliamentary Forum on Climate Change in February 2018, waiting for the approval of the cabinet and the Parliament. Although the National Climate Change Policy provides guidance for adaptation and mitigation measures in the country, the lack of enforcement mechanisms on the policies, visions or action plans justifies the attempt for a climate change bill.

To sum up briefly, this sub-chapter presented the multi-level governance schema of Uganda on climate change, disaster risk and sustainable development paradigms at international, regional and national levels. In the next section, we will take the level of analysis further and focus on the region of Karamoja.

3.3 Regional Background: Karamoja

To begin with the general characteristics, Karamoja is a region located in the north-east of Uganda, neighboring with Kenya and South Sudan. Karamoja is comprised of seven districts as illustrated in Figure 9 and an estimated 1.4 million people inhabit in this region.²¹⁰ The region has always been an area of particular importance and attention for the humanitarian and development organizations, since Karamoja is classified as the poorest and least developed region in Uganda, based on the poverty rates and human

²⁰⁷ Uganda National Climate Change Policy (2015) , p.16

²⁰⁸ Ibid., p.14

²⁰⁹ Ibid., pp. VIII-X

²¹⁰ FAO. (2018). Resilience Analysis Report No.10: Resilience analysis in Karamoja Uganda, p.5

development indexes. Considering the fact that Uganda is classified as a least developed country, Karamoja is one of the poorest and least developed regions in the world, therefore *the poorest of the poor*. To illustrate, the percentage of the people living under the national poverty line in Karamoja is three times more, approximately 75%, than the national average.²¹¹ If we are to take into account the international extreme poverty line of US\$1.90, this rate goes up to 82%.²¹² Moreover, the other human development indicators on health, nutrition, food security, and education -such as maternal and infant mortality, access to water and sanitation, and literacy rates- are observed to be the worst in the region.²¹³

Secondly, the geographic and climatic features of Karamoja play a great role in the socio-economic status of the region. Karamoja is set on a large plateau surrounded by four mountains, Mount Kadam, Mount Napak, Mount Moroto and Mounq Morongole, and much of Karamoja is more than 1,000 meters above sea level.²¹⁴ The land cover is mainly composed of arid and semi-arid savannah, bush lands, thorny plants, seasonal grasslands, and occasional small trees.²¹⁵ The dominant soil types in the region are black clays and dark grey clays that are characterized as low in organic matter, and as medium in moisture storage.²¹⁶



Figure 9. Comprehensive Map of Uganda and Karamoja (by districts) ²¹⁷

²¹¹ Ibid., p.6

²¹² USAID. (2017). Climate Change Risk In Karamoja Uganda: Climate Screening For Food Security, p.1

²¹³ FAO. (2018). Resilience Analysis Report No.10: Resilience analysis in Karamoja Uganda, p.6

²¹⁴ Mubiru, D.N. (2010). Climate Change and Adaptation Options in Karamoja, p.8

²¹⁵ Ibid.

²¹⁶ Ibid., p.4

²¹⁷ The figure is retrieved from Ibid, p.5

Unlike the rest of the country, Karamoja does not have a significant water body, and the water resources are limited to few perennial mountain streams, springs and wells that run off through the seasonal riverbeds.²¹⁸ Lying in the equatorial climate zone, the temperatures are high, “*ranging from a maximum of 28°C to 32.5°C to an average minimum of between 15°C to 18°C in the region.*”²¹⁹ Unlike the rest of Uganda with bimodal rainfall patterns, Karamoja has a mono-modal rainfall pattern with the commencement of rainfall at the end of March and the cessation in October with a short periodic laxity of rain in June, and consequently, there lays a prolonged dry period from November to March.²²⁰ During the rainy season, the rainfall patterns are highly variable and unreliable in the region, therefore erratic, and the patterns may change by year and district. For instance, the amount of precipitation varies from “*as little as 500 mm per annum in the east, to 1200 mm in the west.*”²²¹

Thirdly, bearing in mind the previous features, it is important to take a glance at the dynamics of the socio-economic structure in the region of Karamoja. Traditionally, the Karamojong²²² has been a nomadic, warrior and pastoralist society; however, the state intervention to the armament and militancy in the region through a series of disarmament programmes since 2002 for the restoration of peace, and the government development plans for Karamoja that have been based on the transition to settlement have jointly changed the socio-economic dynamics in the region. In the simplest form, today, the Karamojong people lead a sedentary life, and therefore, in terms of economic activities, the main sources of livelihood in the region are agriculture, agro-pastoralism and pastoralism along with the mining activities on gold and various other minerals, therefore dependent on the exploitation of natural resources. The livestock production and pastoralism -including cattle, goat, sheep and camels- is at the heart of the economic activities in Karamoja because of the high values and side-products of animals; and the cattle is considered to be the most valuable means of livelihood in the region. Indeed, as

²¹⁸ Avery, S. (2014). Review of water development and irrigation in Karamoja, Uganda, p.15

²¹⁹ Mubiru, D.N. (2010). Climate Change and Adaptation Options in Karamoja, p.4

²²⁰ Jordaan, A. (2015). Karamoja Drought Risk Assessment: Is Drought To Blame for Chronic Food Insecurity?, IRC Uganda Country Programme, p.26

²²¹ Ibid., p.25

²²² The name “Karamojong” in this work is utilized to refer to the people of Karamoja and does not indicate a specific ethnic group.

the saying goes, “*the Karamojong live and die for cattle.*”²²³ The Karamojong pastoralists still carry the traces of their nomadic history: the pastoralists in Karamoja are half-nomadic, moving around with their livestock during the dry season in order to find sufficient natural resources such as water and grass to stock their mobile or semi-mobile enclosed cattle camps called *kraals*,²²⁴ and return to their homes when the rainy season starts. In most of the cases, the livestock rearing is combined with subsistence agriculture practices, to complement the household livelihoods; therefore, agropastoralism is the most dominant livelihood strategy of the Karamojong people.²²⁵ Given the hydrological and climate characteristics of the region, there is only one planting and crop growth season per year, which therefore leads to one harvest season per year. The planting starts at the end of March or at the beginning of April, coinciding with the kickoff of the rainy season, and the harvesting continues throughout August and September. Therefore, agricultural production in Karamoja is strictly rain-fed, and the principle cultivation crops are sorghum, maize, cassava, beans, cow-peas, groundnuts, sunflower, simsim²²⁶ and sweet potatoes.²²⁷ The newly introduced agroforestry activities involve the plantation of acacia, shea²²⁸, ekorete²²⁹ and mango trees that provide fruits and seeds for household consumption. In general, from an environmental and socio-economic perspective, the region suffers severe environmental degradation resulting from human activities like overgrazing, tree-cutting and bush-burning,²³⁰ poor infrastructure and high prevalence of vector and water borne diseases such as malaria, typhoid, brucellosis, cholera, dysentery, and tuberculosis,²³¹ poor health practices, and poor sanitation conditions.²³²

Bearing in mind the geographic, climatic and socio-economic features of the region coupled with high poverty levels that erode coping and adaptive capacity, Karamoja

²²³ The saying is retrieved from the field research notes of the author of this work; however, various versions of the saying have been detected in two written online sources.

²²⁴ Jordaan, A. (2015)., p.27; USAID. (2017)., p.7

²²⁵ Jordaan, A. (2015)., p.27

²²⁶ Simsim is the word for sesame in the local language.

²²⁷ Field Notes, 05.03.2018 in Nakapiripirit District Nabilatuk sub-county

²²⁸ Shea tree is a type of African tropical tree that yields a fruit called “shea nut”.

²²⁹ Ekorete is the local name for a local fruit tree that is called desert date or soap berry in English.

²³⁰ Field Notes, 05.03.2018 in Nakapiripirit District Nabilatuk sub-county

²³¹ The prevalent diseases are compiled from the interview with a nurse/midwife in the health center of Nabilatuk sub-county in March 2018.

²³² Mubiru, D.N. (2010), p.4

becomes particularly vulnerable to the risks and impacts of climate change. During the field research that was conducted in Nakapiripirit District in March 2018, it has been comprehended that that climate change manifests itself in the region and district in the form of:²³³

- Increasing average temperatures and sunlight exposure
- Prolonged dry spells (and droughts every two or three years)
- Increasing intensity of rainfall in the rainy season (therefore floods)
- Increasing unpredictability of weather and climate casts
- Erratic rainfall distribution and duration

These manifestations have various economic (agricultural and pastoral), food-related, health-related, water-related and environmental implications for the area.²³⁴ To begin with, the prolonged dry season and sunlight result in failures in the cultivation of crops and vegetables coupled with the water stress for agriculture. In the wake of rainy season, the erratic rainfall patterns (too early or too late rainfall) may also interfere with the natural growth process of the crops. During the rainy season, the heavy rainfall that turns into floods washes out the plantations, which yields almost zero harvest. In return, these cultivation failures lead to periodic hunger and famines in the villages, threatening the food security that is already fragile in the region. Moreover, the warming of the temperatures and increasing intensity of rainfalls affect the livestock as a result of lack of grass and water to sustain the animals and spread of diseases among the animals in warm and wet periods. The loss or damages on crop harvest and livestock therefore strike a major blow on the livelihoods of the Karamojong people, influencing their already scarce incomes. Furthermore, certain diseases and human epidemics become more common in the region combined with the poor infrastructure, sanitation and health services. In the dry season, the respiratory distress spread among the adults and elderly. On the other hand, the rainy season peaks the prevalence of malaria, typhoid and cholera as a result of floods that enhance the water contamination. The fact that the sanitation facilities such as pit latrines, drying racks or bathing shelters are not common

²³³ The manifestations of the climate change in the region are compiled from the focus group discussions held in three different villages (Napayan, Nathinyonoit (A), and Namidikao) in Nakapiripirit district in March 2018.

²³⁴ All the following information and examples are compiled from the general field research notes of March 2018 in Nakapiripirit district including the village focus group discussions and the interviews.

and the lack of effective waste disposal jointly contribute to the contamination and spread of these diseases. Besides, the dry season enhances the water stress in the region, further affecting the water availability given that the water resources are already scarce. The inadequate water supply infrastructure -such as limited number of boreholes and pipes and lack of deep well pumps- makes it difficult for the utilization of the deeper underground water resources in the dry periods. In the rainy season, the water contamination threatens the quality of water available for drinking, irrigation and personal hygiene and leads to water-borne or food-borne diseases. Lastly, while high temperatures and water stress dry out the planted trees and grassland, the heavy rainfall contributes to soil erosion, which reflects on the environmental implications of climate change.

At the beginning, the local communities in Karamoja have developed certain response strategies against the adverse impacts of climate change, especially when the livelihoods were the concern. The traditional response strategies for the harvest failures and livestock loss are composed of short-term business activities that can be economically and environmentally unsustainable in certain cases. These traditional response strategies include:²³⁵

- Seasonal working in the nearby gold mines
- Local brewery
- Firewood collection and tree cutting for sale
- Rock collection for sale
- Small animal breeding such as chicken for sale and subsistence

However, the adverse impacts of climate change have intensified by time accompanied with the adverse impacts of unsustainable human activities on land causing environmental degradation, and thus the dynamics between climate change and human activities have turned into a vicious circle. For instance, firewood collection from bushes, tree-cutting, and stubble burning contribute to deforestation, desertification and soil erosion that may result in the extension of dry spells, affect the amount of rain fall, and reduce soil fertility; which in return damages agricultural production and heightens

²³⁵ The traditional response strategies are compiled from the general field research notes of March 2018 in Nakapiripirit district including the village focus group discussions.

the pervasive climate change impacts.²³⁶ Given this complicated and triggering cycle mechanism, the traditional response strategies of the locals alone were found to be insufficient to cope with the roots of the problem, and the urgent need for adaptation and mitigation has come to the fore. In line with the international, regional and national mechanisms on climate change and sustainable development, the governmental and non-governmental organizations operating in the region have started to direct their attention to the development of strategies and projects that would strengthen the adaptive and coping capacities and reduce the vulnerabilities of the Karamojong communities against climate change and climate-related disaster risks, therefore which enhance *community resilience*.

In the next section, we will direct our analysis into the local and community level with the ECO and Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Karamoja and witness how a climate change and disaster risk project is applied in practice and what outcomes it brings in specific contexts.

3.4 ECO and Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Karamoja

Ecological Christian Organization (ECO) is an indigenous NGO that is based in Uganda, and their mandate extends throughout country with their local offices, from Karamoja to Lake Victoria Basin. ECO envisions an improved quality of life and sustainable livelihoods for the underserved and vulnerable communities through the engagement and empowerment of the underserved and vulnerable groups to discover and overcome the major challenges faced while protecting their rights and dignity for sustainable development in a context of inclusive governance.²³⁷ Therefore, ECO adopts a participatory bottom-up approach in its work, i.e. *community-based*, through the strong emphasis on the empowerment and engagement of communities in planning, implementation and evaluation processes of the projects.

²³⁶ The sequence is taken from the discussions at the Office meeting at the ECO Nabilatuk Field Office on 13 March 2018.

²³⁷ Compiled from the vision and mission statements of ECO, available at <https://ecouganda.org>

The current programs of ECO dwell on:

- Natural Resource Governance
- Resilience and Climate Change Adaptation
- Ecosystems Management and Restoration

While the natural resource governance initiatives focus on the extractives sector, resilience and adaptation concentrates on farmers, pastoralists and fishers; and ecosystem management and restoration centers upon wetlands and forests. Under each program, there are specific projects that are implemented and evaluated separately. Interestingly, in the evaluation process, ECO connects their activities to the SDGs performance.²³⁸ Along with the practical field work, ECO also engages with the advocacy activities for the development of funds and policies related to their three core programs, and there is a multi-level governance system that goes from district to national level in their advocacy. For instance, jointly with the other NGOs, ECO currently contributes to and advocates for the preparation and enactment of Climate Change Bill by the Parliament of Uganda.²³⁹

ECO's Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project in Karamoja falls under the program of resilience and climate change adaptation and covers 25 villages in Nabilatuk and Lolachat sub-counties of Nakapiripirit district and Irriri sub-county of Napak district. The project is funded by CORDAID, the Dutch Catholic Organization for Relief and Development Aid, and built upon the successes and lessons of the previous identical projects. For the evaluation and monitoring, ECO submits bi-annual reports to CORDAID, along with internal monitoring and evaluation mechanisms. Overall, the project aims at deepening and scaling up *community resilience for sustainable development*. In this regard, the CPESDRR project integrates three different dimensions for resilience:

- Climate Change Adaptation
- Disaster Risk Reduction
- Ecosystems Management and Restoration

²³⁸ The meeting notes at ECO Headquarters in Kampala on 28 February 2018, with Prof. Alberto Lanzavecchia, Juliet Katusiime Zizinga, Justin Bob Kocho, and Felix Lochap.

²³⁹ Ibid.

This integrative approach towards resilience is crystal clear when we look through the specific intervention projects that effectuate the CPESDRR, and the project reflects the discussions of the previous chapter on the coordination and engagement of climate change, disaster risk and sustainable development paradigms for resilience building. There are currently eight intervention projects performed under the CPESDRR within the boundaries of Nabilatuk and Lolihat sub-counties of Nakapiripirit District:²⁴⁰

- Village Savings and Loan Associations (VSLAs)
- Climate Information Centers with Disaster Risk Reduction Committees
- Kitchen Gardens
- Apiary (Bee-keeping)
- Environmental Conservation and Tree Planting (Bio-rights)
- Drought-resilient Seeds and Practices
- Energy-saving Stoves
- Hygiene and Sanitation

In the next sub-section, we will now elaborate on these ECO intervention projects in detail.

3.4.1 Interventions ²⁴¹

Firstly, Village Savings and Loan Association (VSLA) is a simple, self-managed and self-capitalized microfinance model²⁴² which allows underserved and isolated rural communities to have an access to basic financial services such as savings and credits. VSLAs are composed of a group of 15-20 people who save together and take low-interest loans from the savings. In this regard, ECO adopted the VSLA approach as part of the resilience initiatives in 2013, and there are 25 VSLAs involving 520 people in Nakapiripirit District under the supervision of ECO's Nabilatuk Field Office.²⁴³ ECO gives trainings on the functioning of VSLAs, record-keeping and business maintenance

²⁴⁰ Since the scope of this research is limited to Nabilatuk and Lolihat sub-counties of Nakapiripirit District, only the intervention projects that are performed within this scope are identified.

²⁴¹ This part is overall based upon the compilation of ECO Nabilatuk Field Office records, meeting reports at the Office, the field visit notes, and the focus group discussions held in the villages of Napayan, Nathinyonoit (A), and Namidikao of March 2018.

²⁴² VSL Associates. (n.d.). Reaching the very poor: The need for a new microfinance model. Available at <http://www.vsla.net/>

²⁴³ The specific numbers have been taken from the ECO Nabilatuk Field Office records.

to the proposed members of a potential VSLA group before the official launch, and after the commencement of the activity, audits the groups constantly. The members of VSLA groups make weekly savings; meet regularly for the activities of book-keeping, tracking the loans out and cash available, and conflict resolution. The interest rate that is going to be applied for the loans is decided by each group and therefore may change, but the rate is generally set between 5% and 10%. Even though the interest rate system is functioning well, there is also an option of pledging an asset (typically cattle) for the borrowing. The profits that are earned from the interest payments are shared among the members of each VSLA group at the end. VSLAs enable their members to borrow big amount of money that is not available at individual or household levels otherwise; and the loans have multiple functions. The most common reasons for borrowing are the payment of school fees and medical services, and business start-ups. Moreover, within climate resilience framework, in case of exposure to the adverse effects of climate change such as crop failures, livestock loss and epidemics, the VSLA provides the financial resource that may be needed for the relevant response and recovery options, such as periodic alternative livelihood start-ups, new drought-resilient seeds purchase, or healthcare and veterinary services.

Secondly, Climate Information Centers are community-managed centers established in the remote and underserved rural areas where access to reliable climate and disaster information is strictly limited. In line with the community resilience goals, ECO has opened and utilized several climate information centers in the remote villages that are under the scope of the CPESDRR Project. Through these climate information centers, ECO aims for strengthening early warning systems for extreme climate and weather events through climate information dissemination and capacity development; so that the effective and timely adaptive and responsive measures can be taken accordingly. Within the body of these centers, there are Disaster Risk Reduction Committees that are established in order to perform the actions, and they are composed of 9-10 members from the villages. These committees collect climate information especially on the prediction of rainfall patterns or dry spells from different resources such as communities and meteorological stations. In the climate information centers of the villages in Nabilatuk and Lolachat subcounties, the DRR Committees integrate the indigenous knowledge retrieved from the traditional early warning indicators of the communities

and the scientific meteorological information coming from the Uganda National Meteorological Authority as well as from the Kenya Meteorological Department due to the geographic proximity. After the comparison of indigenous predictions and scientific data available, the matching information is shared and disseminated among the communities, especially during the church meetings or market days so that they can reach the maximum number of people to inform. At this juncture, these committees attach particular importance to the correct prediction on the commencement of rainy season and harvesting, so that the villagers can clear their gardens, plant their crops and harvest them timely. Moreover, the committees are monitoring the inconsistencies and unmatched information between the local and scientific sources, and they are trying to keep the track of them. Furthermore, the DRR committees hold activities related to bio-rights and environmental conservation, such as organizing awareness raising meetings on the impacts of stubble burning, erroneous firewood collection, and tree-cutting on the livelihoods and environment. Thanks to these awareness raising activities of the DRR committees, the communities acknowledge the fact that one of the triggering reasons of erratic rainfalls and prolonged dry spells is the intensification of environmental degradation in the form of deforestation and desertification, therefore the vicious circle behind.

Thirdly, due to the limited water availability and accessibility during the dry season, the Kitchen Gardens help the communities to maintain the availability and variety of fresh greens and vegetables mainly for the household consumption during the dry spells. As observed in the field, these gardens are very small and divided into two parts for the provision of vegetables constantly: whilst the food products of one side are being consumed, the new products are growing on the other side. The typical vegetables that are grown in the kitchen gardens are onions, carrots, cowpeas, cabbage, and tomatoes. Importantly, the irrigation water for these gardens is provided through the portable water bins that are filled from the closest water pump, in short, hand-carried water. The gardens may also create additional income for the villagers in cases of good yields since the extra products are sold in the markets.

Fourthly, Apiary (bee-keeping) is a relatively new intervention project that has limited application scope in the treatment villages of ECO. Apiary is promoted as an alternative livelihood activity and in the introduction phase the bee hives are provided by ECO. Apiary serves multiple purposes including economic and environmental. For instance, when there is a good harvest, the bee hives can provide enough honey both for home consumption and sales in the market. The acquisitions of the bee hives can also bring environmental benefits, because bee keeping requires a green environment with plants and trees for a good honey production, therefore the bee hive owners are more prone to preserve the environment and plant trees around if there are not. Apiary is an intervention that is economically, socially and environmentally sustainable for the community resilience.

Fifthly, Environmental Conservation and Tree Planting intervention goes hand in hand with the work of Climate Information Centers and DRR committees. Environmental conservation pillar mainly includes awareness raising activities such as trainings on the destructive effects of stubble burning, erroneous firewood collection, and tree-cutting on the environment and livelihoods. The tree-planting pillar focuses on the re-plantation of already-existing tree species in the area and the introduction of new fruit trees and their maintenance. In this regard, the choice of fruit trees such as shea nuts, orange, mango and ekorete is to the point and functions as a multi-purpose agro-forestry initiative: the fruit trees provide food products for the villages to consume and sell in the markets, and at the same time forestation takes place. This intervention project also demonstrates a bio-rights²⁴⁴-like characteristic. In order to encourage environmental preservation and sustainable livelihoods, ECO offers goats or bee hives to the villages recorded with good practices on environmental conservation and restoration, and this makes the communities more enthusiastic and hardworking.

Sixthly, given the prolonged dry spells and strong sun light in the area, ECO promotes the utilization of Drought-resilient Seeds and Practices in the agricultural and agro-forestry activities through the trainings on drought tolerant farming practices, proper

²⁴⁴ Bio-rights is a financial mechanism that provides micro-credits for sustainable development to local communities in return for community involvement in conservation, and enables local communities to refrain from unsustainable practices and be actively involved in environmental conservation and restoration. Retrieved from Eijk, P. & Kumar, R. (2009). Bio-rights in theory and practice: A financing mechanism for linking poverty alleviation and environmental conservation, p.5

agronomics and post-harvest practices such as indicators of good soil, qualities of seeds, mixed cropping, and crop diversification. The scope of the drought resilient seeds ranges from simsim, sorghum, cassava, potatoes, and green gram beans to the vegetable and tree seeds for the kitchen gardens and tree-planting. For instance, since the maize production is severely affected by the extended dry spells and sunlight, ECO advises to the villagers to grow cassava or sorghum for the upcoming cropping periods. In the initial stages, ECO was testing the seeds before distributing to the local farmers; however, since the soil type varies greatly in the area, but after a while they were not able to test the seeds for each type of soil. Therefore, instead of directly distributing the seeds, ECO currently provides the financial means for the community to buy the seeds that are suitable for their soil at the local level.

Seventhly, Energy-saving Stoves are small portable shielded stoves that are made from natural and available resources, simply soil, grass, water. Before the introduction of the energy-saving stoves, the villagers were using an open air three-stone cooking places that required a lot of firewood, affected by the rainfall, and causing fire accidents. ECO provides trainings on the process of stove construction and promotes the energy-saving stoves in the treatment villages, because they are easy to make, requires less firewood, portable to take inside places in case of rains, and safer to use. The stoves are better to be done during the dry season because they need a dry grass for mix, therefore the quality of the stoves decrease in the rainy season. The villagers take advantages of the stoves also by making and selling them in the markets so that it becomes a small business activity that provides additional income in the dry spells; which becomes particularly important in cases of crop failures or livestock loss. Moreover, since the stoves require less fire woods, the people are less prone to collect firewood from the bushes, which contribute to preservation of the environment.

Lastly, Hygiene and Sanitation activities are introduced by ECO in the intervention villages within the scope of community health resilience, because the communities in these villages did not give enough importance to hygiene and sanitation services and they didn't have the basic sanitary components such as, drying racks, rubbish pits, latrines and bathing shelters, therefore the living quarters were filthy and threatening to community health. ECO sensitizes the communities on the personal hygiene and

sanitation and provides trainings on the construction and utilization of the sanitary components, especially of pit latrines and maintenance of the pits. The construction materials that are used for the components are available in nature: clays, woods, or stones. ECO also monitors the utilization and maintenance of the sanitary components, and monitoring becomes vital immediately before the commencement of the rainy season and the return of animals from pasture to the settlements, in order to prevent the spread of diseases such as typhoid, cholera, diarrhea and malaria.

In regard to these eight interventions that are undertaken by ECO and detailed in this sub-section, it is essential to point out that the number and scope of application of the interventions varies across the treatment villages. In other words, at the initial phases, the limited number of interventions in different combinations is prescribed to the villages, taking into account the case situation of the village and the funding available; however, the VSLAs are the indispensable part of all different intervention sets. Besides, the scope and number of the intervention sets prescribed to a village may be extended over progress and time.

As a part of the field research conducted for the purposes of this work, the series of analyses dwell on three treatment villages- Napayan, Nathinyonoit (A), and Namidikao- and their set of interventions. Taking the analysis a step further, we will review the backgrounds, interventions, risks and challenges identified for each village in the following sub-sections.

3.4.2 Napayan ²⁴⁵

Napayan falls within the boundaries Lokaala Parish²⁴⁶ of Nabilatuk sub-county, and it is a relatively new treatment village compared to the other ECO project villages. There are two groups –composed of 20 people each- in this village that are supported by ECO. In terms of provision of basic services, due to the proximity to Nabilatuk center, the village is better-off than many of the villages: there is a water pump and borehole near the village, compatible with the 1000-meter requirement²⁴⁷, the health center is at a reachable distance, and there is a nearby primary school. Therefore, the water

²⁴⁵ This part is based on the field notes of the focus group discussion held in Napayan Village on 6 March 2018.

²⁴⁶ Parish is the sixth administrative unit in Ugandan administrative divisions.

²⁴⁷ See the subsection 2.2.2.2 on right to water and sanitation of this work.

availability and accessibility as well as basic healthcare services are at acceptable levels. In Napayan, the set of ECO interventions includes kitchen gardens, VSLAs, energy-saving stoves and hygiene and sanitation.

In the focus group discussion, the observed changes on the climate and weather events were pointed out by a middle aged woman and confirmed by the other respondents, as the prolonged dry spells, unpredictable and intense rainfall leading to sudden floods. In terms of the effects on livelihood, it is stated that crop failures and bad harvest are more common in the village than the previous decade, and famine is prevalent during the dry season. When asked to reflect on the response strategies, the participants referred to the traditional response strategies and the interventions of ECO.

The discussions on the interventions opened up with the kitchen gardens that introduced the small-scale vegetable farming from scratch to Napayan. The gardens are organized as group gardens in this village, providing vegetables for a number of households. The variety of food products available for home consumption has increased because the previous crops grown were only maize and sorghum. The preferred vegetable to grow is cowpeas in this village, because both the seeds and leaves of the plant are consumable. In terms of VSLAs, the groups make use of the savings and credits for the previously identified multi-purposes like business start-ups, and service fees. There is a share of earnings from harvests that is spared for the VSLA saving box by each member. Moreover, energy-saving stoves are utilized both for self-use and sales, and the villagers go to the ant hills far away in the bushes for the soil supply in the construction mix because the village soil is not suitable for the stove making. At last, the sensitization trainings on hygiene and sanitation have been organized since January 2018.

After that, the Napayan focus group identified the risks and challenges they encounter both in the implementation processes of the interventions and in general. The first point was that the lack of cooperation among groups affects the cultivation of the kitchen gardens. Since they are group gardens, many people neglect the maintenance of the gardens assuming somebody will eventually do the work. Another point was the lack of seeds at the end of the dry periods for re-plantation. When the crops of previous season fail and they do not have enough food in the storages to survive the dry season, they consume the seeds saved for re-plantation because the seeds are eatable. Every year

therefore, they buy new seeds in the market for re-plantation, which is an additional cost for the villagers at a time of limited income in the dry season. In this regard, the cash available of VSLAs and savings of people diminish during the dry season because the credits and savings are extensively utilized to launch alternative livelihoods and to buy additional food products when the stored food is sufficient to meet the needs. Yet another point regarded the distance of soil needed for the energy-saving stoves, because a portion of income earned from the stoves is used for the payment of people going to the bushes to collect soil; which reduces the profitability of stove sales.

Lastly, the focus group reflected on how to deal with the risks and challenges, and they agreed on the collection of group contribution money from each member for the maintenance of kitchen gardens that they benefit from. It is worth noting that the group did not reflect on adaptation or disaster risk reduction strategies for the root causes, but focused on the communal problems.

3.4.3 Nathinyonoit (A) ²⁴⁸

Nathinyonoit (A) is located within the boundaries of Lotaruk Parish of Lolachat sub-county, and ECO has been operating in this village for a longer period of time than Napayan. There are two groups –composed of 30 people each- supported by ECO in this village. In terms of provision of basic services, the village is disadvantaged. There exists a water pump and borehole near the village within the 1000-meter distance requirement that provides water for five more surrounding villages; however, the amount of water provided is not sufficient for six villages because the pipes are not deep enough and fall short to extract the water that is found to be at deeper points. Thus, the availability and accessibility of the water is questioned. Moreover, the nearest health center and primary school are located in the center of Lolachat, and they are not easily reachable because there lays a riverbed between the village and Lolachat center, without a bridge available to cross over. The riverbed fills up with water during the rainy season; therefore, the access to basic services becomes even more problematic in the rainy season. In Nathinyonoit (A), the combination of ECO interventions contains VSLAs, kitchen gardens, drought-resilient seeds and practices, energy-saving stoves,

²⁴⁸ This part is based on the field notes of the focus group discussion held and pictures taken in Nathinyonoit(A) Village on 7 March 2018.

climate information centers with DRR committees, and environmental conservation and tree planting.

At the beginning of the focus group discussion, the participants identified the prolonged dry spells and excessive sun light as the observed changes in the climate. When asked on the effects on livelihoods, they addressed the crop failures due to water scarcity and the impacts of lack of water and pasture on the small animals -goats mainly- that remain in the village during the dry season. It was also pointed out that in the previous seasons, the crop failures led to zero harvest that caused hunger in the village and the severity of hunger reached in the extreme cases to loss of lives among the elderly and children due to starvation. Appertaining to response strategies, the group mainly referred to the ECO interventions, and briefly mentioned the traditional methods.

The discussions on the ECO interventions started with VSLAs that are utilized mostly for the business start-ups and seasonal alternative livelihoods. With regard to kitchen gardens, illustrated in Figure 10, the respondents stated that their gardens successfully provide the members with fresh vegetables for home consumption during the dry season, and they divide their gardens into two for the continuous availability. In terms of drought resilient seeds, they addressed the increased crop variety due to the vegetable and fruit tree seeds while emphasizing the importance of timely plantation for a good yield. Moreover, the energy-saving stoves are produced by the villagers for the self-use and sales. The climate information centers with DRR committees have been the central point of discussion since the respondents devoted the majority of time to this intervention project. There is a climate center located in the village, with a DRR committee that is composed of 9 people. The DRR committee collects information on traditional early warning systems from the elderly and scientific data from the Kenyan Meteorological Department²⁴⁹, compares the available data and information for prediction, and disseminates the matching information to the community for the preparation of the fields and timely plantation right before the commencement of rainfall.

²⁴⁹ The reasons for the choice of Kenyan authorities are listed by the committee as the geographical proximity and approximate compatibility of climate characteristics. The committee also argued for the lack of any other close by fully functional weather station for the choice of Kenyan authorities; however, the choice of Ugandan authorities in the other DRR committees of nearby villages created confusion on the information provided by the Nathinyonoit (A) DRR committee.



Figure 10. A kitchen garden in Nathinyonoit (A) ²⁵⁰

The committee also keeps the tracks of inconsistencies between the two sources and records them for the next years. Moreover, ECO and the committee provide joint trainings to raise awareness and disseminate information on the vitality of tree-keeping and on the damages of stubble burning and tree-cutting, which overall contributes to the preservation of environment. In this regard, the village engages with the tree-planting activities through the fruit trees. For the protection of existing and newly planted trees, the villagers developed a traditional deterrence and punishment method for tree-cutting that if a person is caught or later detected cutting a healthy tree; s/he is punished by beating in front of the elderly.

The last part of the focus group discussion was devoted to the reflections on the risks and challenges that were endured in the past and may be encountered in the future. The participants noted that the village does not have enough means for harvesting such as ox ploughs and scythe. The majority of farmers resorts to borrow the means of their neighbors and waits their turns to use them for the harvest. However, by the time the tools are available for some farmers, the harvest turns out to be late and lead to crop failures. Moreover, the DRR committee addressed that although the forecasts of last

²⁵⁰ The picture was taken during the field visit in Nathinyonoit (A) on 7 March 2018.

year were correct for the timely plantation, there appeared a type of green worm that destroyed the crops, therefore, there was not a good harvest. In terms of tree-planting, the group stated that during the dry season, the planted fruit trees were prone to dry out in the growth phase due to lack of water and intense sunlight and the existing trees were prone to be caught up by fire accidents. Besides, the DRR committee members raised the concerns on the accuracy and reliability of the climate predictions for the planting period of 2018. This year, the committee relied solely on the traditional early warning systems because of the delay of the scientific data from the official meteorological authorities for the examination and comparison with the indigenous knowledge. At last, the lack of adequate infrastructures such as road, bridge and water pipes as well as the limited access to basic healthcare services pose a perpetual systemic and structural challenge for the inhabitants of Nathinyonoit(A).

3.4.4 Namidikao ²⁵¹

Namidikao is located within the boundaries of Nakobekobe Parish of Nabilatuk sub-county, and it is one of the villages that ECO has been operating for the longest period of time. Similar to the previous villages assessed, there are two ECO treatment groups – composed of 30 people each- in Namidikao. In terms of provision of basic services, the village is disadvantaged: the closest water pump and boreholes are found to be slightly more than 1000 meters away, which does not meet the 1000-meter distance standard for the accessibility. Moreover, the nearest health center and primary school is located in the center of Lolachat, therefore they are not at an easily reachable distance. Thus, the availability and accessibility of water, healthcare and other basic services are considered to be strictly limited and insufficient. The set of interventions by ECO in this village has the largest scope among the villages and includes climate information center with DRR committee, environmental conservation and tree-planting, drought resilient seeds, apiary (bee-keeping), VSLAs, energy-saving stoves, and hygiene and sanitation.

In the first part of the focus group discussion, the participants reflected on the observed changes in the climate and weather patterns, and stated that the dry spells are becoming more common, the rainfalls are not predictable since the frequency of rain fall is

²⁵¹ This part is based on the field notes of the focus group discussion held and pictures taken in Namidikao village on 9 March 2018.

decreasing while the intensity is increasing. For instance, they pointed out that in December, there is generally supposed to be a very short rainfall period but this year it did not happen. Moreover, they elaborated on the previous years' inconsistent weather patterns. For instance, they exemplified that while in 2011, there was an extended dry spell that turned into drought leading to crop failures, in 2012, the dry spell was not prolonged but then the heavy rainfall resulted in floods that washed out the plantations, yielding bad harvest. They expected the rainfalls to continue in the following year and made preparations accordingly; however, the opposite happened. In 2013, the drought and excessive sun light marked the planting season and dried out the crops soon after. The effects on the livelihoods were not limited to the agriculture, and the small livestock was also adversely affected due to the water scarcity and inadequate grass in the droughts of 2011 and 2013. The participants expressed that the chain of 2011-2012-2013 inconsistencies made them realize that the weather casts and climate conditions were not predictable anymore. In this regard, after the year 2013, they became aware of the fact that they could not continue with the usual crops and methods for agricultural and livestock production, and they acknowledged the urgent need for the utilization of the resilient means. In terms of resilient means and response strategies, the focus group interestingly did not refer to the traditional response mechanisms, but they solely reflected on the intervention projects of ECO.

The discussions on the intervention projects commenced with the climate information center and the DRR committee. The participants addressed that they used to rely on witch doctors for the prediction of the climate and weather events and often failed, but thanks to the center and the committee, they have a more reliable source of information from the natural early warning systems and scientific data obtained from the Ugandan Meteorological Authority. The DRR committee compares the indicators and data of these sources, makes a prediction, and then spreads the word to the villagers to prepare the gardens, fields and seeds for planting. The committee takes advantage of crowded occasions in order to reach the maximum number of people, such as Sunday prayers. Moreover, the climate information center has become the common place to have community meetings, such as VSLA meetings as illustrated in Figure 11; therefore the facility serves a multi-purpose. Furthermore, the DRR committee performs the trainings



Figure 11. A debt pay-off between the VSLA members at the Climate Information Center in Namidikao ²⁵²

and the information dissemination related to the environmental preservation and tree-planting. Thanks to these activities by the committee, the villagers acknowledged that environmental degradation intensifies the impacts of dry spells and rainfall patterns. In this regard, there are also the tree-planting initiatives that are in the form of fruit tree seedling for multi-purposes. For example, they planted mango seedlings last year. In order to ensure the preservation of existing and newly planted trees, the committee developed a utilitarian punishment method for tree-cutting that if a person is caught by or detected later cutting a tree, s/he has to plant and maintain 5 trees. Furthermore, during the planting activities of the trees or crops, the DRR committee mainstreams the utilization of drought resilient seeds in the village, given the water stress and dry spells. In short, the performance of the intervention projects that are connected with climate, environment and agricultural production is assigned jointly to the DRR committee. The intervention discussions proceeded with apiary (bee-keeping). In Namidikao, there are several households provided with bee hives by ECO, as illustrated in Figure 12.

²⁵² The picture was taken during the field visit in Namidikao on 9 March 2018.



Figure 12. Two beekeepers with their bee hives in Namidikao ²⁵³

Apiary created a new source of livelihoods for the villagers, since the beekeepers -along with crop production- produce honey for home consumption and sales in the market. During the discussion, a young male beekeeper underlined the good honey harvest of last year, and pointed out that he produced plenty of honey to sell in the market, earned good income from the sales, spent the portion of income for the acquisition of goats and saved the rest. Therefore, he was able to follow a save and re-invest approach. He continued that during the dry season, due to the water scarcity, they place small water containers on the trees in order to sustain the bees. Following this, a DRR committee member added that apiary contributes to the efforts of environmental preservation in the village since the beekeepers are prone to keep and protect the trees and plants around for the bees and therefore for a good honey harvest. The participants of the focus group discussion after then reflected on the essential role of VSLAs in their activities considering the absence of banking services in the area. They highlighted that the VSLAs make large amount of money available for borrowing in case of emergencies as well as financing business start-ups, alternative livelihoods, medical and veterinary expenses; therefore providing a simple banking service. Later, the discussion continued on the energy-saving stoves, and the villagers indicated that the stoves are safer and

²⁵³ The picture was taken during the field visit in Namidikao on 9 March 2018.

easier to use. They produce them for self-use and market value, and there are ant hills near the village that provides the proper soil for construction mix. In terms of hygiene and sanitation, the participants stated that the village used to neglect the importance of personal hygiene and environmental cleaning. They did not have any sanitary components including latrines or bath shelters; and therefore during the rainy season, they suffered more frequently from the diseases such as typhoid, cholera and malaria. After the trainings on sanitary component construction and sensitization, they became capable of digging and maintaining latrines, and today they utilize all the sanitary components.

Lastly, the focus group defined the risks and challenges posed by climate change and structural inadequacy for their village. The root challenge identified by the participants was the limited water accessibility coupled with prolonged dry spells. They indicated that even the sustainable and resilient crops such as sorghum started to be affected by the dry spells and lack of water, thus, the crops do not yield bountiful harvests anymore. Considering also the impacts of water stress on the small animal husbandry, in response, the villagers dug an open air storing pot in order to provide water for irrigation and small animals; however, the storing pot is noted not to be sufficiently functional due to extreme evaporation during the dry spells. Moreover, the planted mango seedlings as well as the indigenous fruit trees dried up due to the prolonged dry spell of last year and lack of irrigation. The villagers expressed their disappointment on the dried fruit trees because they tried their best to maintain the trees with hand-carried water hoping to harvest the fruits; however, the amount of water naturally was not enough for the trees to survive the dry season. On the sanitary components, they reported that since the structures are built with clay and woods, the heavy rains washes the clay out, thus, they are not sustainable during the rainy season. Last year, there also appeared a spread of type of pest insect, the termites, that fed on woods and they destroyed the wood constructions. Thus, the participants indicated that the lack of proper infrastructure and services -specifically those of a water system or pump, health centers as well as veterinary and agriculture consultancy offices- undermines their efforts for building a resilient community and a sustainable way of developing. After this close examination of ECO interventions in the focus treatment villages, we will now review the process and findings of the impact assessment conducted as a part of the field study.

3.5 Impact Assessment of ECO's Project Interventions in Three Villages

First of all, impact assessment is a process of identification and evaluation of the effects, changes and consequences brought forth by a proposed, ongoing or completed project or action; and it is an integral part of all components of a project life cycle²⁵⁴; mostly associated with the implementation, monitoring and closing phases. According to the timing and purpose of the conduct of an assessment, an impact assessment can be regarded as ex-ante, ex-post or a combination of ex-ante and ex-post. In the simplest terms, ex-ante is a forward-looking assessment that is typically conducted during the planning of a project before carried into practice and estimates the future impacts; and ex-post is a backward-looking assessment that is typically conducted after the implementation or closure of a project and evaluates the up-to date or past impacts.²⁵⁵ However, in practice, an effective project management requires the utilization of both ex-ante and ex-post assessments within a project life cycle. Moreover, an impact assessment can take a qualitative or quantitative approach depending on the choice of evaluation and representation models, methods and tools. In terms of the scope and level, an impact assessment may focus on environmental, social and/or economic dimensions within different levels of governance units such as community, local, city, regional, and national.

In this light, as a part of the present case study, an impact assessment has been performed in order to evaluate and enhance the implementation and effectiveness of ECO intervention projects and actions in the treatment villages. Since the assessment has been made in the implementation phase, we considered the impacts to date, and also reflect on the future possible impacts if the project is extended to other villages given the contextual similarities. Therefore, the assessment is characterized as a combination of ex-ante and ex-post assessments. Moreover, this assessment adopts a qualitative and participatory approach in terms of data collection and evaluation methods, which include participant observation, focus group discussions, and audio-visual materials in the field. The answers and statements of the focus group discussion participants on the

²⁵⁴ Project life cycle is a path that a project takes from the beginning to its end. Typically, a project life cycle is composed of five phases: initiation, planning, implementation, monitoring and closure. Retrieved from Watt, A. (2014). the Project Life Cycle (Phases). In A. Watt's *Project Management*, p.21

²⁵⁵ Initiative for Climate Action Transparency (ICAT) Sustainable Development Guidance First Draft 2017 , p.36

open-ended questions captured the community judgments and perceptions on the intervention projects; which facilitated the local ownership and control of data generation and analysis.²⁵⁶ In addition, the comparative and illustrative statements of the focus groups on the impacts of interventions helped the consideration of treatment and control group mechanism in the assessment. The comparisons and illustrations by the focus group participants set the treatment group as the people that are part of ECO interventions and control group as the groups that are not part of ECO or any other treatment within the villages. Thus, the focus group discussions provided a set of qualitative-interpretive information for the impact assessment. Furthermore, the differences in the periods of time of ECO interventions in each village allowed a interpretive-comparative assessment among the villages; therefore it was possible to control the impacts of ECO interventions progressively through the least treated, medium-treated and the most treated villages, which had been identified as Napayan, Nathinyonoit (A) and Namidikao respectively. In doing so, environmental, social and economic dimensions have also been taken into account for the assessment, and for each dimension, impact categories, specific impacts and indicators have been identified²⁵⁷, as presented in Table 2.

Environmental, Social and Economic Impact Categories and Indicators
1. Environmental Impact Categories and Indicators
1.1 Land
1.1.1 Land use change, including reforestation, degradation, and desertification
1.1.1.1 Indicators: Intensity of tree-cutting activities by locals, tree-planting, preservation initiatives, introduction of new crops to land
1.2 Resilience for Climate Change
1.2.1 Indicators: Adaptive and response strategies, mitigation measures, climate change awareness, environmental health and safety
2. Social Impact Categories and Indicators
2.1 Health and Wellbeing
2.1.1 Accessibility and quality of health care
2.1.1.1 Indicators: Access to the nearest health center, treatments offered, and medicines provided
2.1.2 Illness-death-well-being

²⁵⁶ Garbarino, S. & Holland, J. (2009). Quantitative and Qualitative Methods in Impact Evaluation and Measuring Results, p.7

²⁵⁷ The methodology for the identification of the impact categories, specific impacts and indicators has been inspired and compiled from the ICAT Sustainable Development Guidance First Draft, 2017.

2.1.2.1 Indicators: The mainstream diagnosed illness in the area, mortality ratios and mortality causes (elderly, infant or maternal ratios)
2.1.3 Access to adequate sanitation
2.1.3.1 Indicators: Access to sanitary components, available sanitary components in the households
2.2 Food Security
2.2.1 Hunger and nutrition
2.2.1.1 Indicators: Food products diversity and availability, nutritious values
2.2.2 Agricultural Production
2.2.2.1 Indicators: Intensity and frequency of droughts and floods and crop failures
2.3 Poverty
2.3.1 Economic and Non-economic dimensions of poverty
2.3.1.1 Indicators: Income, savings, access to basic services
3. Economic Impact Categories and Indicators
3.1 Overall economic activity
3.1.1 Indicators: Income, savings, livelihoods diversification, sustainability of livelihoods

Table 2. Environmental, Social and Economic Impact Categories and Indicators ²⁵⁸

Since the control and treatment groups are in the form of communities and villages, the range of assessment has been attributed to community and local levels.

In the next sub-sections, we will first identify the main findings of this assessment going through the statements and observation from the villages and then we will connect the findings of this impact assessment to the nexus of SDGs and human rights that are elaborated in the scope of the thesis.

3.5.1 Findings of the Impact Assessment of ECO’s Project Interventions in Three Villages

Firstly, in Napayan, it has been found out that the kitchen gardens through the introduction of vegetable-farming for home consumption and markets increased the variety of food products available, improved nutritious value for the households, enhanced the food security, and provided additional income as a livelihood , therefore had positive social and economic impacts. Moreover, the villagers confirmed that hygiene and sanitation trainings have improved the access and utilization of sanitary

²⁵⁸ The table is author’s own work.

components in the village; therefore they witnessed the improvements on the sanitary and health conditions in the village and its surroundings compared to the prior untreated periods, therefore positive environmental and social impact. The energy-saving stoves have been determined not to have a major impact in this village, especially on the alternative livelihoods of this village, due to the long reaching distance to the required soil, therefore no economic impact. In terms of the VSLAs, their multi-purpose use is reflected on multiple impacts: the increased savings and availability of large amount of money for emergencies, business start-ups, alternative livelihoods and healthcare services enhanced the resilience and sustainability of livelihoods and access to basic services, and lowered the economic dimension of poverty, therefore yielded positive social and economic impacts. Table 3 shows the findings of the impact assessment at a glance for Napayan village.

Intervention	Environmental Impacts	Social Impacts	Economic Impacts
Kitchen gardens	No information	Positive Food security Nutrition	Positive Additional Income and Livelihood
Hygiene and Sanitation	Positive Environmental Health	Positive Health, Wellbeing, Sanitation	No information
Energy saving stoves	No information	No information	No information
Village Saving and Loan Associations (VSLAs)	Not applicable	Positive Poverty Reduction (Economic)	Positive Savings and Business Start-ups, Alternative Livelihoods

Table 3. Recap of Impacts of Interventions in Napayan Village ²⁵⁹

Secondly, in Nathinyonit(A), it has been found out that kitchen gardens and drought resilient seeds, thanks to vegetable-farming and new resilient crops for agricultural production, increased the variety of food products and improved nutritious value for people, and enhanced the crop diversification on land for agricultural production as an adaptation strategy, therefore had positive environmental, social and economic impacts. However, the externalities of unforeseen climate and weather patterns, such as droughts and extreme precipitation, leading to crop failures are recognized in this assessment as inhibitors for the identified positive impacts. Moreover, the introduction of energy-

²⁵⁹ The table is author's own work.

saving stoves in this village has been reported by the villagers to reduce the number of fire accidents like house burns, respiratory distress among women, and the amount of firewood required, thus yielded positive environmental and social impacts. The stoves also allowed the villagers to create seasonal livelihood and additional income from the market sales; therefore also yielded positive economic impacts. Besides, VSLAs uplifted the savings, and provided available credits for emergencies and business start-up, therefore had positive social and economic impacts. Furthermore, the climate information center with a DRR committee -coupled with the trainings on environmental conservation and tree planting- increased the accessibility and quality of climate information and disaster preparedness, resulted in timely crop planting thanks to correct climate predictions, raised awareness on the importance of environmental preservation. In this regard, the DRR committee reported that the villagers stopped cutting trees and stubble burnings because they became aware of the fact that the trees provide them livelihood in the form of fruits, leaves and seeds, and that environmental degradation due to unsustainable activities, triggers the impacts, intensity, and frequency of climate extremes; therefore overall yielded positive environmental and economic impacts. Table 4 presents the recap of findings of impact assessment in Nathinyonoit (A) village.

Intervention	Environmental Impacts	Social Impacts	Economic Impacts
Kitchen Gardens and Drought-resilient seeds	Positive Land Use Change New Crop Introduction	Positive Food Security Nutrition	Positive Additional Income and Livelihood
Energy saving stoves	Positive Environmental Conservation	Positive Health and Safety	Positive Seasonal Livelihood and Additional Income
Village Saving and Loan Associations (VSLAs)	Not applicable	Positive Poverty Reduction (Economic)	Positive Savings and Business Start-ups, Alternative Livelihoods
Climate Information Center and DRR Committee	Positive Climate change awareness	Positive Food Security Less crop failures	Positive Agricultural Sector Income Generation
Environmental Preservation and Tree planting	Positive Environmental Conservation and Reforestation	Positive Food security Nutrition	No information

Table 4. Recap of Impacts of Interventions in Nathinyonoit (A) Village ²⁶⁰

²⁶⁰ The table is author's own work.

Thirdly, in Namidikao, the villagers first manifested that VSLAs, through the increasing savings, available credits and record-keeping, upgraded the socio-economic conditions of the families that are part of a VSLA compared to the families that are not, and taught the VSLA members how to keep a balance and maintain their businesses more effectively, therefore yielded positive social and economic impacts. Moreover, the introduction of energy-saving stoves decreased the number of fires accidents and respiratory distress, provided an alternative and profitable livelihood to the villagers due to the good quality soil available near the village for the construction mix, and required less firewood collection, therefore had positive environmental, social and economic impacts. The drought resilient seeds were not mentioned in the discussion; therefore it is inferred not to yield a substantial impact in this village. Furthermore, it has been found that hygiene and sanitation trainings and sensitization in the village enhanced the community access and knowledge on sanitary practices, increased the number of sanitary components in the houses, reduced the incidents of diseases that resulted from lack of sanitation such as typhoid, cholera and diarrhea, and improved the environmental health therefore induced positive environmental and social impacts. Besides, it has been determined that apiary (bee-keeping) provided multiple benefits first through honey production for home consumption and market sales: honey for home production provided an additional food product with nutritious value to the villagers that otherwise hard to obtain, and honey production for sales deemed to be a profitable livelihood source in the village to the point that enabled savings. Bee-keeping also helped to preserve the environment due to the need for trees and plants around for good honey harvest, the beekeepers were more eager to keep the village surroundings green. Therefore, apiary created positive environmental, social and economic impacts in this village. In addition to this, the climate information center and DRR committee enhanced the accessibility and quality of climate and weather information, provided more reliable forecasts on climate and climate-related disasters, and resulted in timely crop planting and disaster preparedness. The trainings on environmental conservation and tree-planting activities resulted that the villagers stopped cutting the trees; and the punishment method of “5 new trees for 1 lost tree”²⁶¹ and community tree-planting enhanced the environmental restoration.

²⁶¹ See the sub-section 3.3.4 on Namidikao of this work.

The respondents in the discussion stated that they want to keep the village green, since they became aware of the vicious cycle of environmental degradation and intensified climate hazards. The climate center has also found to become a place for community meetings and social activities. At last, the participants reported they embraced the trainings, instructions and techniques introduced to them and experienced the benefits, so that they are grateful to have this center. In short, the climate center, DRR committee and environmental conservation have been regarded to yield positive environmental, social and economic impacts. Table 5 wraps up the findings of the assessment for Namidikao village.

Intervention	Environmental Impacts	Social Impacts	Economic Impacts
Village Saving and Loan Associations VSLAs	Not applicable	Positive Poverty Reduction (Economic)	Positive Savings, Business Start-ups, Alternative Livelihoods
Energy saving stoves	Positive Environmental Conservation	Positive Health and Safety	Positive Alternative Livelihood and Income
Drought-resilient Seeds	No information	No information	No information
Hygiene and Sanitation	Positive Environmental Health	Positive Health, Wellbeing, and Sanitation	Not applicable
Apiary (Bee-keeping)	Positive Environmental Conservation and Reforestation	Positive Food security Nutrition	Positive Alternative Livelihood and Income
Climate Information Center and DRR Committee	Positive Climate change awareness Sustainable land use	Positive Food security Less crop failures	Positive Agricultural Sector and Income Generation
Environmental Preservation and Tree planting	Positive Environmental conservation and reforestation	Positive Food security Nutrition	No information

Table 5. Recap of Impacts of Interventions in Namidikao Village ²⁶²

²⁶² The table is author's own work.

After a comparative analysis of the findings in each village and groups within, the key findings that have been drawn in general terms are as follows:

- VSLAs, Climate Information Centers and DRR Committees, Kitchen Gardens and Apiary are the most favored, beneficial and responsive interventions by ECO, yielding major positive impacts in all three dimensions.
- The level, scope and application time period of the interventions are directly proportionate to the level of climate awareness, community resilience and sustainable practices achieved. In this regard, while the interventions in Napayan yield the least progress results and impacts, the Nathinyonoit (A) interventions stay at a medium level, and the interventions in Namidikao demonstrate the best progress results and practices.
- Systemic, infrastructural, geographic and climatic conditions and their externalities play an immense role in the achievement of successful outcomes for ECO interventions; therefore we recognize the risks and challenges they may pose as inhibitors in the path for climate resilience and sustainable development.

Although the present impact assessment reflects more an ex-post nature, the findings can be utilized as guidance on “what outcomes and impacts to expect under what conditions” for the intended future extensions of the CPESDRR project by ECO to the nearby villages; therefore the assessment also reveals ex-ante characteristics. We will now explore the SDGs and human rights relevance of the ECO interventions and the impacts.

3.5.2 SDGs and Human Rights Relevance

Bearing in mind the scope and content of the ECO interventions coupled with the impact assessment above, we see the connections of the interventions with specific SDGs and human rights, especially with the nexus of SDGs and human rights²⁶³ that have been determined and examined as focal points in this thesis. The methodology for the attribution includes the comparison of the interventions and their impacts with the specific targets of each SDG that provided the SDG scope and content of each human

²⁶³ See the subsections 2.2 The Human Rights Implications of Climate Change and 2.3.1 Sustainable Development Goals (SDGs) of this work.

rights defined by the relevant human rights instruments. Moreover, in the attributions of ECO interventions with these frameworks, both the ex-post impacts assessed above and potential impact areas have been considered simultaneously. Therefore, at the end, the assessed and potential impacts of these interventions tell us something on the SDGs performance and human rights standards fulfillment. We will commence with the SDGs relevance, and then proceed to the relevance to human rights standards.

In respect of the attribution to the SDGs, firstly, climate information centers with DRR committees are determined to be in connection with the SDG1 (no poverty), SDG2 (zero hunger), SDG3 (good health and wellbeing), SDG 13 (climate action) and SDG15 (life on land). This intervention relates to SDG 1 through the contributions to the productivity of agricultural sector which enhances the incomes of farmers and diminishes the economic dimension of poverty, and the activities for the resilience through exposure and vulnerability reductions to climate-related disasters. Moreover, the SDG 2 relevance originates from the correct forecasts and information resulting in good harvests and less crop failures that at the end provide sufficient food and nutrition, enhancing food security and variety. The intervention also increases the adaptive capacity to climate change and extremes, which is also embedded in the scope of SDG2. Besides, there exists a relation with SDG 3 through the promotion of healthy environment with trainings, food supply and variety as determinant of health, and fewer health and life risks through early warning and DRR systems. Furthermore, the trainings on climate change awareness, and DRR practices fall within the content of SDG 13, while sustainable land use promotion and agricultural practices such as no-more stubble burning are associated with SDG 15.

Secondly, VSLAs and their impacts are found to be in regard to SDG 1, SDG 3 and SDG 13. The attribution to SDG 1 comes from the enhancement of financial services available for alternative livelihoods and maintenance of businesses in the rural areas through microfinance, which helps the poverty reduction, as well as through the utilization of VSLAs as a resilience mechanism for economic, social and environmental shocks. Moreover, the use of VSLA loans for the access to basic services, including healthcare, medicines or treatments is in direct connection with the content of SDG 3.

Since the intervention is a financial resilience mechanism for the adverse impacts of climate-related events or disasters, it falls also to the scope of SDG 13.

Thirdly, the drought-resilient seeds are identified with the SDG 1, SDG 2, SDG 3, SDG 13 and SDG 15 considering their potential impacts. The contributions to maintained productivity of agricultural sector and income earnings during climate-driven droughts are in connection to the poverty reduction in rural areas, therefore SDG 1. In return, resilient seeds resulting in less crop failures that enhance the food availability and nutrition are associated with SDG 2 and through food and nutrition as determinants of health and wellbeing, with SDG 3. Since drought-resilient seeds are a resilience strategy by definition through adaptation, it is related to the targets of SDG 13. Moreover, the new crop introductions through resilient seeds to the land and sustainable agricultural practices relate to the SDG 15.

Fourthly, the kitchen gardens are pertinent to SDG 1, SDG 2 and SDG 3. Being an additional source of livelihood and income for households in cases of good harvest, this intervention helps to reduce the economic dimension of poverty in rural areas, which is related to SDG 1. Moreover, the kitchen gardens improve the food and nutrition variety for the households significantly, which are one of the determinants of general health and wellbeing, as the focus is on vegetable-farming, and this connects them with the contents of SDG 2 and SDG 3.

Fifthly, apiary or bee-keeping, are determined to be in relevance with SDG 1, SDG 2, SDG 3, SDG 13 and SDG 15. Since apiary is attributed to be a profitable additional source of livelihood and income in the impact assessment above, it contributes to the economic poverty reduction in rural areas so that relates to SDG 1. The honey production for home consumption provides an additional food product with good nutritious value, improves the food availability and variety for general health and wellbeing, therefore it is connected to SDG 2 and SDG 3. Moreover, apiary is a resilience strategy and adaptation method for the adverse impacts of climate change on livelihoods in the area, thus considered within the content of SDG 13. Furthermore, apiary is found to bring environmental benefits since it requires plants and trees around, and contribute to environmental conservation efforts, which is in line with the targets of SDG 15.

Sixthly, the impacts of environmental conservation and tree planting are found to be linked with SDG 2, SDG 3, SDG 13 and SDG 15. Since tree planting takes place in the form of fruit trees, it provides fruits for household consumption and increases the food variety and nutritious values available, therefore implies improvements for the SDG 2 targets. The increased food variety and nutrition coupled with health environment, thanks to environmental conservation, relate to general health and wellbeing, so SDG 3. Moreover, environmental conservation reduces the intensely felt impacts of climate change, and considered as an adaptive mitigation measure, thus falls within SDG 13.

The intervention in particular contributes to reforestation efforts, biodiversity and habitat conservation, and reduces the levels of soil erosion and desertification, so that operates within the scope of SDG 15.

Seventhly, the intervention on hygiene and sanitation, by definition, directly mirrors the scopes of SDG 3 and SDG 6 (water and sanitation). The positive impacts of sanitation activities on health and wellbeing as well as environmental health, and the reduction in the cases of waterborne diseases such as typhoid and cholera correlate with SDG 3 targets and indicators. Moreover, the improved access to sanitation services and components, and potential reduced water pollution by improved refuse disposal evoke the scope and targets of SDG 6.

Lastly, and eighthly, energy-saving stoves are determined to be interrelated to SDG1, SDG 3, SDG 13 and SDG 15. These stoves become an alternative source of livelihood and income in the rural areas, and help to reduce the economic dimension of poverty; therefore associated with SDG 1. Since these stoves require less firewood and are safer to use, they reduce the respiratory distress among women and the risk for fire accidents; thus linked to SDG 3. The less firewood requirement means less wood burning and less CO₂ emissions, so that it becomes a minor mitigation measure in connection with SDG 13. In this regard, less firewood needs result in the less fire wood collection from the bushes and trees that contribute to environmental conservation, which links up with SDG 15 content. In short, Table 6 encapsulates collectively the SDGs relevance of ECO interventions and impacts.

ECO Intervention Projects	SDG1 No Poverty	SDG2 Zero Hunger	SDG3 Good health and well-being	SDG6 Clean Water and Sanitation	SDG13 Climate Action	SDG15 Life on Land
Climate Information Centers with DRR Committees	X	X	X		X	X
Village Saving and Loan Associations (VSLAs)	X		X		X	
Drought-resilient Seeds	X	X	X		X	X
Kitchen Gardens	X	X	X			
Apiary (Bee-keeping)	X	X	X		X	X
Environmental Conservation and Tree Planting		X	X		X	X
Hygiene and Sanitation			X	X		
Energy-saving Stoves	X		X		X	X

Table 6. Attribution of ECO Interventions and Impacts with the nexus of SDGs ²⁶⁴

When we come to the human rights attribution, first of all, climate information centers with DRR committees are found to be related to right to life, right to adequate standard of living, right to food and right to health that comprise healthy environment. The intervention is in connection with right to life since the early warning systems and DRR activities decrease the likelihood for loss of lives resulting from exposure to climate and natural hazards. Moreover, the accurate and timely forecasts and early warning systems lead to fewer damages on livelihoods, properties, and economic activities, which correlate with the wide scope of right to adequate standard of living. In this regard, the decent agricultural outputs and less crop failures thanks to forecasting and early warning improve the food availability and accessibility that have an influence on the fulfillment of the prerequisites of right to food. The early warning systems and DRR that lower the threats to lives and wellbeing, and improved food availability are linked with the right to health as well.

Secondly, the impacts of VSLAs are determined to be associated with the objectives and scopes of right to adequate standard of living and right to health, and given the multi-purpose nature of the VSLAs, there are various aspects that are in interplay. For

²⁶⁴ The table is author's own work.

instance, the financial resources availability in rural areas opens way for accessibility and affordability of basic services, including health care, medicines and treatments, therefore improves the general standards for living. Moreover, VSLAs as financial means for the maintenance of livelihoods in case of emergencies enhance resilience for economic, social and environmental shocks, thus enable the stabilization of the normal functioning of life and conditions in times of local-scale shocks or disasters; which overall affect the level of enjoyment of right to adequate standard of living and right to health.

Thirdly, drought resilient seeds are detected to be in connection with right to adequate standard of living, right to food, and right to health. In rural areas where droughts are experienced commonly, the seeds help to maintain the productivity of agriculture due to their drought tolerance nature and secure the income and earnings from agriculture and related livelihoods to a certain extent; thus assist the enjoyment of right to adequate standard of living. In line with this, the reliable harvest patterns and decent agricultural outputs can enhance the food security and nutritional values, especially when introduced in the form of vegetable seeds, which is linked with the prerequisites of right to food as well as the determinants of right to health.

Fourthly, kitchen gardens are found to bear upon the right adequate standard of living, right to food and right to health. The kitchen gardens provide an alternative emergency livelihood source although in limited scale since they are very small gardens for home consumption mainly, and enhance food variety and nutritious values with vegetables and fruits that are otherwise not accessible and affordable in a rural area; therefore, these gardens contribute to the realization of right to adequate standard of living and right to health at household levels.

Fifthly, the impacts of apiary (bee-keeping) activities are determined to be relevant to the contents of right adequate standard of living, right to food and right to health. Apiary is considered to be a profitable alternative livelihood for the rural areas with frequent exposure to droughts or floods that undermine agricultural production and livelihoods, create good income and earnings, and thus relate to the aspects of right to adequate standard of living. Moreover, apiary supplies honey for home consumption, which increases the food variability and nutritive values for households, which falls

under the realization of right to food. Furthermore, along with the food and nutrition supply, we have seen that apiary contributes to the environmental conservation that provides a green and healthy environment for communities, which overall relates to some of determinants -food and healthy environment- of health thus affect the level of realization of right to health.

Sixthly, environmental conservation and tree planting are identified to be in correlation with right to adequate standard of living, right to food, and right to health. Due to the fact that the tree-planting takes place in the form of fruit trees, they can provide a limited scale livelihood source in case of emergencies through sales of the fruits of trees, which can support the enjoyment of right to adequate standard of living in emergencies. Moreover, the intervention supplies new and nutritious fruits for home consumption that are otherwise not accessible to the communities so increases the food variety and nutritious values, which influences the aspects of right to food and right to health. Besides, the environmental conservation and tree planting create a green and healthy environment for the communities, therefore relates to the right to health from a different channel as well.

Seventhly, the impacts of hygiene and sanitation interventions are detected to be appertaining to the enjoyments of the right to life, right to adequate standard of living, right water and sanitation, and right to health. Through the sensitization on personal and environmental hygiene and the utilization of sanitary components, the intervention reduces the risks for loss of lives from water-borne and vector-borne diseases such as malaria and cholera; which can fall under the scope of right to life coupled with right to health. The improved housing conditions equipped with sanitary components such as bathing shelters and pit latrines relate to the general standards of living. Moreover, the intervention enhances the access to sanitation services and components as well as reduced water pollution thanks to better refuse disposal methods, which is in regard to right to water and sanitation. Furthermore, along with reduced risks for water-borne and vector-borne diseases, hygiene and sanitation activities improve the environmental health conditions with better refuse disposal and management, and upgrade the general health and wellbeing in personal and community levels.

Lastly, energy-saving stoves have relevance with right to life, right adequate standard of living, and right to health. The fewer fire accidents that cause threats to lives especially for the children relates to the right to life. The intervention also improves the housing conditions with these stoves, and is considered to be an alternative livelihood activity that brings out additional income, which reflects the general improvements in living standards. The stoves, moreover, decrease the incidents of respiratory distress and exposure to smoke, thus affects the household health and wellbeing. Table 7 wraps up the attribution of all the interventions with the specific human rights standards.

ECO Intervention Projects	Right to Life	Right to Adequate Standard of Living	Right to Food	Right to Water And Sanitation	Right to Health including healthy environment
Climate Information Centers with DRR Committees	X	X	X		X
Village Saving and Loan Associations (VSLAs)		X			X
Drought-resilient Seeds		X	X		X
Kitchen Gardens		X	X		X
Apiary (Bee-keeping)		X	X		X
Environmental Conservation and Tree Planting		X	X		X
Hygiene and Sanitation	X	X		X	X
Energy-saving Stoves	X	X			X

Table 7. Attribution of ECO Interventions and Impacts with the nexus of Human Rights²⁶⁵

Since we have already seen the relationship between the SDGs and human rights, we observe in this section that an intervention is directly associated with the SDG and human right that show the nearly similar content and scope. It is acknowledged that this may have created repetitions throughout the section; however, there also exist the differences in the attributions to the SDGs and human rights framework due to the simultaneous consideration of the results of ex-post impact assessment and expected impacts in theory as well as the distinctive focus points of the SDGs and human rights

²⁶⁵ The table is author's own work.

standards. If we are to make an overall inference, within the SDGs framework and human rights framework respectively:

- SDG 1, SDG 2, SDG 3, SDG 13 and SDG 15 are determined to be the most related with the ECO project interventions, especially the climate information centers with DRR committees, drought resilient seeds, and apiary.
- Right to adequate standard of living, right to food and right to health are found to be the most relevant rights with the ECO project interventions, especially the climate information centers with DRR committees, and hygiene and sanitation.

Taking into account the aggregate analyses of this chapter thus far, we will now finalize the practical case study through a prospective insight that reflects on the graduation and exit strategies for the projects during the full implementation phase.

3.6 Prospect for Action: Graduation and Exit Strategies

In the development discourse, the issues of graduation and exit have become a new concern regarding the implementation and finalization of development projects and programs in developing countries. The graduation and exit considerations overall aim to ensure the long-term sustainability of the achieved outcomes and impacts of the projects and programs²⁶⁶ through strategic plans; however, there exist some differences. In this regard, an exit strategy is a specific plan describing how a project or program intends to withdraw from an entire area while assuring that the achievement of development goals is not jeopardized and that expertise and momentum for change is not lost.²⁶⁷ On the other hand, a graduation strategy refers a specific plan for the gradual withdrawal of resources and support from particular communities, program sites or activities.²⁶⁸ In most of the cases, graduation from specific program sites or activities is used as a step towards the eventual total withdrawal of resources,²⁶⁹ because the transition should be undertaken smoothly. In order to ensure a smooth and successful transition, the exit or graduation strategies should be a part of the project life cycle from the very beginning,

²⁶⁶ Macias, K.E. & Rogers, B.L. (2004). Program Graduation and Exit Strategies: Title II Program Experiences and Related Research, p.1

²⁶⁷ Ibid.,; James, R. (2015). Is there such a thing as responsible exit? In Rachel, H. et.al. (2016), *Exit strategies and sustainability lessons for practitioners*, p.7

²⁶⁸ Macias, K.E. & Rogers, B.L. (2004), p.i

²⁶⁹ Ibid., p.1

with a flexible content that can be adjusted and updated if necessary in the process of project implementation. The initial inclusion of graduation process and exit strategies in the project cycle informs the communities in advanced that the resources are scarce and will be withdrawn eventually; therefore advises them to make full use of the projects and programs to learn new practices, embrace and absorb them so that they can continue the implementation on their own once programs come to an end.²⁷⁰

In the development literature, there are various approaches to exit strategies, factors and criteria that are to be carefully considered, depending on the nature and timeliness of projects and programs and the conditions in the project and program application areas.²⁷¹ The three basic approaches to exit strategies are: ²⁷²

- Phasing Down
- Phasing Over
- Phasing Out

Firstly, phasing down is commonly defined as gradual reduction of project or program activities and deployment of fewer resources by the original sponsors, implementing agencies or donors; which mirrors the initial stages of graduation process. Secondly, phasing over refers to the smooth transfer of responsibility for activities aimed at accomplishing the goals to another entity including indigenous NGOs, local governments and communities themselves. Lastly, phasing out is defined as the withdrawal of resources and activities without a responsibility transfer to another entity.

Taking into account the characteristics of three approaches, the phasing down leading to phasing over is determined to be the most sustainable and successful approach to eventual exit. Within the phase out options, community take-over is the most commonly documented exit approach and there are many examples of such activities still functioning effectively years after program exit; and an exit strategy relying on community take-over requires appropriate training and capacity building and gradual

²⁷⁰ The Lutheran World Federation (LWF). (n.d.). LWF Uganda Strategy 2015-2020, p.19

²⁷¹ Mkomagi, J. V. (2013). Master's Dissertation: Effectiveness of exit strategies on sustainability of development projects in Tanzania: a case study of selected world vision Tanzania projects, pp.8-9

²⁷² The three approaches are originally identified by Levinger and McLeod (2002) in their work *Hello I must be going: Ensuring quality services and sustainable benefits through well-designed exit strategies*; as cited in Macias, K.E. & Rogers, B.L. (2004), p.2

transfer of responsibility to the community group.²⁷³ In this process, the provision of guidance and technical assistance on reduced basis for a period of time could be beneficial to monitor and evaluate the program functioning within the community without the constant resource supplied by donor or implementing agency, so that prior to exit, the community group has a track record of independent functioning.²⁷⁴

Along with the approaches, the criteria and factors to take into account while deciding on when and how to exit are also crucial in the planning of strategies.²⁷⁵ Firstly, the time frame of project or program should be clearly set, so that the stakeholders are informed by when they should be ready for withdrawal. Secondly, the criteria for graduation and exit should be identified, such as the assessment of progress toward the achievement of specific targets through the impact indicators for exit; as well as the benchmarks to be met for graduation of communities. Thirdly, the identification of potential agencies for take-over coupled with evaluation of each agency capacity eases the detection of the most relevant and equipped agency for the transfer of responsibilities. Lastly, all the stakeholders must be a part of the process and stay in constant communication for a successful and owned transition. Whilst bearing in mind these criteria and factors, the recognition and properly address of existing and future systemic, structural, natural and socio-economic challenges hold utmost importance for the realistic preparation of the graduation and then exit strategy. In short, the five fundamental considerations for the development of graduation and exit strategies are determined as follow:

- A clear time frame of the project detailing expected graduation and exit phases
- Identification of criteria for exit and benchmarks for graduation processes
- Identification of potential agencies and evaluation of capacity for take-over
- Stakeholder participation and communication
- Addressing the existing and future challenges for the sustainability of project

²⁷³ Macias, K.E. & Rogers, B.L. (2004), p. ii

²⁷⁴ Ibid.

²⁷⁵ The following criteria and factors are compiled from: Macias, K.E. & Rogers, B.L. (2004), p. iii ; Gardner, A. et.al (2005). What We Know About Exit Strategies: Practical Guidance for Developing Exit Strategies in the Field, p.10; and Hayman, R. & Lewis, S. (2014). NGO Exit Strategies: Are Principles For Closing Projects Or Ending Partnerships Necessary?, In Rachel, H. et al. (2016) *Exit strategies and sustainability lessons for practitioners*, p.2

As an indigenous NGO funded by an international donor, ECO, through Nabilatuk Field Office, is currently engaging in the development of graduation and exit strategies for the treatment groups in the villages of the CPESDRR project in Nabilatuk and Lolohat sub-counties in Nakapiripirit District during the implementation phase of the project. During the field research stay under the supervision of ECO, one of the hot topics in the office meetings has been the urgency for the planning of graduation and exit strategies. In this regard, the aim of ECO at the present time seems not to be a complete withdrawal of resources and project interventions from the area or the villages but the smooth graduation of certain successful treatment groups from the project scope. The underlying reason for this initiative is to direct the spared resources to new groups of beneficiaries that have not been yet treated at all in the area, therefore extending to other villages.²⁷⁶ In addition to this, ECO seeks to clarify with the communities that the funding is limited and is not going to be always there so as to prevent the dependency on donor money and equipment of the treatment groups. In this way, ECO expects that the graduated groups will be able to continue to implement the introduced practices and move forward their own, which is more sustainable and beneficial in the long run.²⁷⁷

Since the development of graduation and exit strategies has commenced during the implementation phase, contrary to the advised inclusion from the beginning, there are several obstacles ahead for ECO in the initiation of strategies. Firstly, the treatment groups should be informed about the upcoming graduations and exits from the project so that disappointment or unpreparedness is eliminated. There still lacks a specific set of measurable targets, impacts and benchmarks for the assessment of visible and valuable intervention outcomes and progress coupled with the conditions of the villages, so that the graduating groups can be identified.

In this regard, the findings of the impact assessment entrenched in this work can be utilized as a starting point to think about the progress evaluation with a more detailed set of specific impacts and indicators. The relevant candidate agencies for the transfer of responsibility are yet to be identified as well. Therefore, in the light of all information and data gathered in the field work, above-mentioned literature, and the impact assessment conducted within the scope of this work, we will put forward some

²⁷⁶ ECO Nabilatuk Field Office Weekly Monday meeting records of 5 March 2018.

²⁷⁷ Ibid.

recommendations for the development process of graduation and exit strategies by ECO for the treatment villages and groups.

First of all, according to the findings of the impact assessment of this work, Namidikao is found to be the one and only village at a close phase for an initiation of graduation process among three villages examined. However, considering the general infrastructural, climatic and socio-economic situations in the area, there are serious risks and challenges that may result from the abovementioned situational externalities for the permanent and self sustainability of the project interventions in post-graduation periods, even for Namidikao village. In other words, there is always the possibility that the infrastructural, climatic and socio-economic situations may deteriorate and the change or impacts may not be long lasting. For this reason, there are currently no immediate candidate groups or villages that are fully suitable and prepared for graduation or exit from ECO's project sites.

Secondly, if we are to consider the graduation and exit strategy planning for the upcoming periods, we find out that a phase-down approach that eventually leads to phase over is the most suitable and promising path for the development of successful graduation and exit strategies within the scope of ECO CPESDRR project. For instance, the best-functioning intervention projects that yield quick and permanent impacts in the successful villages could be the first ones to be gradually withdrawn from the resources and support of the project in the phase down, so that graduation commences with them. Moreover, the interventions that are found to have insignificant impacts in certain villages due to the structural and natural externalities can be taken out in the phase down as well. Besides, the interventions that are determined to be beneficial but yet to be improved are to be left as the last ones for the graduation and exit processes.

Thirdly, the community take-over is found to be the most advantageous and sustainable solution in the phase over for ECO, and the channels for community take-over could be the community groups, community networks or key individuals within a community. In the smooth transition period, while the groups and villages are working on meeting the benchmarks and standards set for the exit; the trainings, capacity strengthening, transfer of skills and knowledge on the management and sustainability of interventions should continue to be undertaken by ECO for the community take-over agents.

At this juncture, for instance, the presence of VSLA groups and DRR committees in each intervention village provides a serious advantage for the determination of community take-over agent. Since the members of VSLA groups and DRR committees are readily trained and empowered to some extent, a modest level of additional management and sustainability trainings can qualify these community networks as appropriate candidates for take-over.

Fourthly, even if a graduation or exit from the resources and support of the project is given to an intervention village or group, the supervision and monitoring activities by ECO staff should be carried on for a period of time even though on a reduced basis. The limited continued supervision and monitoring is useful for ECO in order to make post-intervention success evaluation for the graduation or exit strategies. Above all, the groups and villages may not be able to become self-sufficient right away since the permanent self-sustainability is a process that extends over time. Therefore, in the mean while, the promotion of self-help initiatives enables communities to overcome the minor risks and challenges of the externalities on their own in the post-intervention process.

Lastly, if ECO extends the CPESDRR project interventions to the new groups and villages thanks to the resources spared from the graduated and exited communities, a “*communities helping communities*” approach could create mutual benefits for ECO, graduated communities and the new beneficiaries. The committed previous intervention groups can be a role model and engage in trainings and assistance activities along with ECO for the newly entering communities in the nearby areas, sharing their experience and lessons learnt, and encourage the new beneficiaries as a standing evidence of scale-up thanks to the accomplishment of the project interventions.

In short, a progressive project management with a vision of sustainability requires the consideration of graduation and exit strategies at a point of the project life cycle in advance, since the resources are scarce and constantly re-allocated. In this regard, ECO is currently working on the planning of graduation and exit strategies for the CPESDRR project in Nakapiripirit district. During the 20-day membership of ECO Nabilatuk Field Office staff, we have been asked to reflect and discuss upon the ideas on this matter, therefore the final part of this study aimed at contributing to the prospective planning of graduation and exit strategies by ECO Nabilatuk Field Office and proposed several

recommendations that are based upon the information and data collected during the field and desk research, the nature of the project and background of the implementation area, and the impact assessment findings. At this juncture, it is important to clarify that the impact assessment findings and recommendations listed on the exit strategies in this research are partial due to the limitations of the research that are identified as weather conditions affecting our ability to re-visit the villages for further discussions and lack of up-to-date quantitative data on the indicators of impact assessment that could be better assessed quantitatively. The aforementioned findings and recommendations identified in this work do not reflect any official attribution with the evaluation mechanisms and exit strategy planning of ECO Uganda.

CONCLUSION

In this research, we overall aimed to comprehend the functioning of discourses of climate change adaptation, disaster risk reduction, human rights and sustainable development in practice through the lenses of multi-level governance at a particularly vulnerable local and communal context with a case study from Karamoja, Uganda; while attributing the explored implications to the chosen thematic nexus of human rights standards and sustainable development goals.

We communicated that climate change is happening for real at an unprecedented scale across the globe in different forms through the symptoms and signs of our planet. The physical adverse impacts of climate change on terrestrial and aquatic ecosystems, hydrological cycles, atmospheric system, and natural resources have profound effects on the human systems as well environmentally, socially and economically; interfering with the normal functioning of communities, economic systems, provision of basic needs for human survival and aspirations for sustainable development. In order to efficiently cope up with these adverse impacts and to eliminate the barriers for sustainable development processes, the global community resorted to the planning, implementation and evaluation of climate change mitigation and adaptation, disaster risk reduction and sustainable development strategies and actions through the international instruments such as Paris Agreement, Sendai Framework for Disaster Risk Reduction and Agenda 2030 for Sustainable Development. We underlined that the general guidance of these international instruments is to be ideally customized and adjusted in accordance with

specific geographical, social, economic, educational, and infrastructural conditions of a given region or country. This discussion brought us to the concept of resilience that aimed for vulnerability reduction and capacity building, since the level of interference of climate change on human systems has found to be highest for the poorest and most vulnerable communities around the world where the factors of chronic poverty and inadequate infrastructure are prevalent; which intensifies the experienced adverse impacts. Considering this, the present research acknowledged that a resilience agenda for communities is considered complete and enriched when climate change adaptation, disaster risk reduction and sustainable development frameworks are taken together; through their different viewpoints and contributions to community resilience on different sectors, contexts and scales.

In terms of human rights attribution, we deduced that the theoretical compatibility of the relationship between human rights and climate change may seem complex; however, the connections become self-evident once examined in practical terms through the implications of climate change on the underlying factors of enjoyment of various human rights standards: right to life, right to adequate standard of living, right to food, right to water and sanitation, and right to health. The scopes of this nexus of rights are found to be of utmost importance, complementary and inseparable for the international human rights framework, and also to be relevant for the essence of the recent global agendas for climate change, disaster risk and sustainable development. At this juncture, we have drawn the attention to the discussion of sustainability and sustainable development paradigm and stated that climate change impairs the path for sustainable development aspirations. In this regard, we examined the impairments through the implications of climate change on the thematic nexus of Sustainable Development Goals: SDG1 no poverty, SDG2 zero hunger, SDG3 good health and wellbeing, SDG6 water and sanitation, SDG13 climate action and SDG16 life on land.

In the last part of this research, we transferred the theoretical frameworks examined in the first and second chapter into multi-level governance practice with the case study from Karamoja, Uganda through the Climate Proof and Eco-Smart Disaster Risk Reduction (CPESDRR) Project of Ecological Christian Organization (ECO) under the supervision of ECO's Nabilatuk Field Office in Nakapiripirit District.

After pointing out the general characteristics of Uganda and multi-level governance schema of the country on climate change, disaster risk and sustainable development paradigms, we expressed that the region of Karamoja is particularly vulnerable to the risks and impacts of climate change due to the geographic, climatic and socio-economic features and indicators of the region coupled with high poverty levels that erode coping and adaptive capacity against climate change. In this light, we based our local and community level analysis on climate change resilience and adaptation through the close examination of ECO's CPESDRR Project interventions in three villages of Napayan, Nathinyonoit(A) and Namidikao, and the qualitative impact assessment performed in this work. The scope of the project interventions and results of the impact assessment have been associated with the thematic nexus of human rights and sustainable development goals in order to see the performance of the project on the enjoyment of the selected human rights standards and on the achievement of the selected SDGs. According to the analysis, we first found out that among the intervention projects, the VSLAs, Climate Information Centers with DRR Committees, Kitchen Gardens and Apiary are the most favored, beneficial and responsive interventions by ECO in these villages, yielding major positive impacts in environmental, social and economic dimensions. Then, we established that the level, scope and application time period of the interventions are directly proportionate to the level of climate awareness, community resilience and sustainable practices achieved; and also assessed that the systemic, infrastructural, geographic and climatic conditions and their externalities play an immense role in the achievement of successful outcomes for ECO interventions along with socio-economic particularities therefore we recognized the risks and challenges they may pose as inhibitors in the path for climate resilience and sustainable development. In the light of this, we determined that while the interventions in Napayan village yielded the least progress results and impacts, and the Nathinyonoit(A) interventions stayed at a medium level; the interventions in Namidikao demonstrated the best progress results and practice. Later, in relation to the human rights and SDGs attribution, we identified that the ECO project interventions are most relevant with the underlying conditions for the enjoyment of right to adequate standard of living, right to food and right to health. In line with the scope of the rights, the interventions are found to be most related with SDG 1, SDG 2, SDG 3, SDG 13 and SDG 15. At last, we took a

prospective stance within the case study, and reflected on the exit and graduation strategy planning for the ECO CPESDRR project. We overall recommended that a phase down approach that eventually leads to phase over is the most suitable and promising path for the development of successful graduation and exit strategies in the upcoming periods and the community take-over is found to be the most advantageous and sustainable solution in the phase over within the scope of ECO CPESDRR project, therefore taking a community-based stance.

All in all, we reach to fruition that ECO Uganda's work in Nakapiripirit District through Climate Proof and Eco-Smart Disaster Risk Reduction Project constitutes a successful multi-level governance case on working towards community resilience against climate change in particularly vulnerable contexts, since the organization undertakes its project interventions at a local level through a participatory community-based approach while acting in accordance with the priority areas and actions that are emphasized within the international, regional and national policy instruments of Uganda; and the present project of ECO Uganda successfully harmonizes the inseparable paradigms of climate change adaptation, disaster risk reduction and sustainable development on their path for building resilient communities.

BIBLIOGRAPHY

African Union. (2015). *Agenda 2063: the Africa we want* (popular version). Retrieved from https://au.int/sites/default/files/pages/3657-file-agenda2063_popular_version_en.pdf

African Union. (2014). Draft African Union Strategy on Climate Change. Retrieved from http://www.un.org/en/africa/osaa/pdf/au/cap_draft_aclimatestrategy_2015.pdf

African Union. (n.d.). What is Agenda 2063?. Retrieved from <https://au.int/en/agenda2063>

Aminzadeh, S.C. (2007). A moral imperative: Human rights implications of climate change. *Hastings International and Comparative Law Review*, 38 (2), pp.231-265. Retrieved from <http://gnhre.org/2014/07/16/moral-imperative-human-rights-implications-climate-change-s-c-aminzadeh/>

Ansuategi, A. et.al. (2015). The impact of climate change on the achievement of the post-2015 sustainable development goals. Climate and Development Knowledge Network(CDKN). Retrieved from <https://cdkn.org/wp-content/uploads/2015/05/Impact-of-climate-on-SDGs-technical-report-CDKN.pdf>

Araujo, J. et.al. (2016). Uganda Country Factsheet: Current and projected future climate. In J. Araujo et.al.'s *Africa's climate: Helping decision-makers make sense of climate information*. Future Climate For Africa. Retrieved from http://2016report.futureclimateafrica.org/wp-content/uploads/2016/10/CDKNJ4897_FCFA_Print_WEB_15.pdf

Arndt, C. et.al. (2012). Economic Development under Climate Change. *Review of Development Economics*, 16 (3), pp. 369-377. John Wiley & Sons Ltd. Retrieved from <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-9361.2012.00668.x>

Avery, S. (2014). Review of water development and irrigation in Karamoja, Uganda. Retrieved from http://www.fao.org/fileadmin/user_upload/drought/docs/REPORT%20DCA%20KARAMOJA%20FINAL_March%202014.pdf

Ayers, J. and Forsyth, T. (2009) Community based adaptation to climate change. *Environment: Science and Policy for Sustainable Development*, 51 (4). pp. 22-31. Retrieved from http://eprints.lse.ac.uk/24188/1/Ayers_Forsyth_Community_based_adaptation_to_climate_change_2009.pdf

Bodansky, D. (2010). Introduction: Climate change and human rights: Unpacking the issues. *Georgia Journal of International and Comparative Law*, 38 (3). Retrieved from <http://digitalcommons.law.uga.edu/gjicl/vol38/iss3/3/>

Behnassi, M. et.al. (Eds.). (2014). *Vulnerability of agriculture, water and fisheries to climate change: Toward sustainable adaptation strategies*. Dordrecht: Springer Science+Business Media. Retrieved from <https://www.springer.com/gp/book/9789401789615>

Birkmann, J. & Von Teichman, K. (2010). Integrating disaster risk reduction and climate change adaptation:key challenges—scales, knowledge, and norms. *Sustainability Science*, 5 (2), pp.171-184. Retrieved from https://www.researchgate.net/publication/226789441_Integrating_disaster_risk_reduction_and_climate_change_adaptation_Key_challenges-scales_knowledge_and_norms

Caney, S. (2009). Climate change, human rights and moral thresholds. In S. Humphreys, *Human Rights and Climate Change*. New York: Cambridge University Press.

Campbell, B. M. et.al. (2016). Reducing risks to food security from climate change. *Global Food Security*, 11, pp. 34-43. Retrieved from <https://www.sciencedirect.com/science/article/pii/S2211912415300262>

Chaplin, D. et. al. (2017). *The Impacts of Climate Change on Food Security and Livelihoods in Karamoja*. Copenhagen, Denmark: Research Program on Climate Change, Agriculture, and Food Security. Retrieved from https://ccafs.cgiar.org/publications/impacts-climate-change-food-security-and-livelihoods-karamoja#.W6gC_XszbIU

Committee on the Development Policy (CDP) & UNDESA. (2015). *Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures Second Edition*. United Nations Publication. Retrieved from <https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/2015cdphandbook.pdf>

Danish Institute for Human Rights. (2018). *Human Rights and the 2030 Agenda for Sustainable Development*. Retrieved from <https://www.humanrights.dk/publications/human-rights-2030-agenda-sustainable-development-lessons-learned-next-steps>

Davoudi, S. & Porter, L. (Eds.). (2012). Applying the Resilience Perspective to Planning: Critical Thoughts from Theory and Practice. *Planning Theory & Practice*, 13 (2), pp. 299–333. Retrieved from <https://www.tandfonline.com/doi/full/10.1080/14649357.2012.677124>

- Dell, M. et.al. (2008). Climate Change and Economic Growth: Evidence from the last half century. *National Bureau of Economic Research (NBER) Working Paper Series*, Paper no: 14132. NBER. Retrieved from <http://www.nber.org/papers/w14132>
- Dowla, A. (2009). Climate change and microfinance. *Graamen Foundation Publication Series, November 2009*. Retrieved from <https://grameenfoundation.org/resource/climate-change-and-microfinance>
- Duran, D.C. et. al. (2015). The objectives of sustainable development - ways to achieve welfare. *Procedia Economics and Finance* 26, pp. 812-817. Retrieved from <https://www.sciencedirect.com/science/article/pii/S2212567115008527>
- East African Community Secretariat. (2010). East African Community Climate Change Policy. Retrieved from http://www.bnbadvocates.com/publications/Climate_change_law/CCL00002.pdf
- Eijk, P. & Kumar, R. (2009). Bio-rights in theory and practice: A financing mechanism for linking poverty alleviation and environmental conservation. Wetlands International. Retrieved from https://www.researchgate.net/publication/293796786_Bio-rights_in_theory_and_practice_A_financing_mechanism_for_linking_poverty_alleviation_and_environmental_conservation
- Elliott, A.J. (2013). What is sustainable development, In *An Introduction to Sustainable Development* (4th ed.). London: Routledge.
- European Commission. (n.d.). Kyoto 1st commitment period (2008-12). Retrieved from https://ec.europa.eu/clima/policies/strategies/progress/kyoto_1_en
- Food and Agriculture Organization (FAO). (2018). Resilience Analysis Report No.10: Resilience analysis in Karamoja Uganda. Retrieved from <http://www.fao.org/3/i8365en/I8365EN.pdf>
- Flint, R.W. (2013). Basics of sustainable development, In *Practice of Sustainable Community Development*. New York: Springer. Retrieved from <https://www.springer.com/gp/book/9781461450993>
- Garbarino, S.& Holland, J. (2009). Quantitative and Qualitative Methods in Impact Evaluation and Measuring Results. Governance and Social Development Resource Center (GSDRC). Retrieved from <http://www.gsdr.org/docs/open/eirs4.pdf>
- Gardner, A. et.al (2005). What We Know About Exit Strategies: Practical Guidance for Developing Exit Strategies in the Field. C-SAFE Regional Learning Spaces Initiative. Retrieved from <https://reliefweb.int/sites/reliefweb.int/files/resources/A02C7B78FB2B408B852570AB006EC7BA-What%20We%20Know%20About%20Exit%20Strategies%20-%20Sept%202005.pdf>
- Giddens, A. (2009). *the Politics of Climate Change*. Polity Press.

- Goosse, H. (2015). Brief history of climate: causes and mechanisms. *Climate System Dynamics and Modelling*. New York: Cambridge University Press. Retrieved from <http://www.climate.be/textbook/>
- Gregson, J. (2017). The World's Richest and Poorest Countries, *Global Finance Magazine*. Retrieved from <https://www.gfmag.com/global-data/economic-data/worlds-richest-and-poorest-countries>
- Hall, N. (2016). The institutionalization of climate change in global politics. In E. Atkins and G. Sosa-Nonez (Eds.), *Environment, Climate Change and International Relations*. E-International Relations Publishing.
- Hayman, R. & Lewis, S. (2014). NGO Exit Strategies: Are Principles For Closing Projects Or Ending Partnerships Necessary?, In Rachel, H. et al. (2016) *Exit strategies and sustainability lessons for practitioners*. Retrieved from <https://www.intrac.org/wpcms/wp-content/uploads/2016/11/Exit-strategies-and-sustainability.-Lessons-for-practitioners.-November-2016.pdf>
- Hepworth, N. & Goulden, M. (2008). Climate Change in Uganda: Understanding the implications and appraising the response. Edinburgh: LTS International. Retrieved from https://reliefweb.int/sites/reliefweb.int/files/resources/7F1BF4A7CF37F6A54925756F0016ED29-Full_Report.pdf
- Huq, S. et.al. (2015). Impact of climate change on least developed countries: Are SDGs possible?. Retrieved from <http://pubs.iied.org/pdfs/17298IIED.pdf>
- Humphreys, S. (2009). Introduction: Human rights and climate change. In S. *Human Rights and Climate Change*. New York: Cambridge University Press.
- Humphreys, S. (2009). Competing claims: human rights and climate change. In S. Humphreys, *Human Rights and Climate Change*. New York: Cambridge University Press.
- Initiative for Climate Action Transparency (ICAT). (2017). Sustainable Development Guidance First Draft. Retrieved from <http://www.climateactiontransparency.org/wp-content/uploads/2017/07/ICAT-Sustainable-Development-Guidance-First-Draft-26-JUL-2017.pdf>
- International Covenant on Economic, Social and Cultural Rights. (1966). UN General Assembly Resolution A/RES/2200A(XXI). Retrieved from <https://www.ohchr.org/Documents/ProfessionalInterest/cescr.pdf>
- International Covenant on Civil and Political Rights. (1966). UN General Assembly Resolution A/RES/2200A(XXI). Retrieved from [http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_2200A\(XXI\)_civil.pdf](http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_2200A(XXI)_civil.pdf)

IPCC, Core Writing Team, Meyer, L.A. & Pachauri R.K. (Eds.). (2014). *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva, Switzerland.

IPCC, Edenhofer, O.et.al. (Eds.). (2014). *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

IPCC, Field, C.B. et.al. (Eds.). (2014). *Climate Change 2014: Impacts, Adaptation, and Vulnerability Part A: Global and Sectoral Aspect. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

IPCC, Field, C.B. et.al. (Eds.). (2012). *Special Report of the Intergovernmental Panel on Climate Change: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. Cambridge University Press.

IPCC, Houghton, J.T. et.al. (Eds.). (2001). *Climate Change 2001: Physical Science Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

IPCC, Metz, B. et.al. (Eds.). (2007). *Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

IPCC, Stocker, T.F. et.al. (Eds.). (2013). *Climate Change 2013: Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press

IPCC, Solomon, S. et al. (Eds.) (2007). *Climate Change 2007: Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

Jackson, P. (2007). From Stockholm to Kyoto: Brief history of climate change. *The Magazine of the United Nations UN Chronicle*, 44 (2). Retrieved from <https://unchronicle.un.org/issue/green-our-world>

James, R. (2015). Is there such a thing as responsible exit? In Rachel, H. et.al. (2016), *Exit strategies and sustainability lessons for practitioners*. Retrieved from <https://www.intrac.org/wpcms/wp-content/uploads/2016/11/Exit-strategies-and-sustainability.-Lessons-for-practitioners.-November-2016.pdf>

Jordaan, A. (2015). Karamoja Drought Risk Assessment: Is Drought To Blame for Chronic Food Insecurity?, IRC Uganda Country Programme. Retrieved from https://www.researchgate.net/publication/275887293_Karamoja_Uganda_Drought_Risk_Assessment_Is_drought_to_Blame_for_Chronic_Food_Insecurity

Kennedy, C., Lindsey, R. (2015). What's the difference between global warming and climate change?. Retrieved from <https://www.climate.gov/news-features/climate-qa/whats-difference-between-global-warming-and-climate-change>

Keohane, R.O. (2015). The 2014 James Madison Lecture, The Global Politics of Climate Change: Challenge for Political Science. American Political Science Association. Retrieved from <http://depts.washington.edu/envirpol/wp-content/uploads/2014/07/Keohane2015.pdf>

Kyotalimye, M. et.al. (2010). IFPRI Discussion Paper 13: Strategies for Adapting to Climate Change in Rural sub-Saharan Africa. The International Food Policy Research Institute. Retrieved from http://www.adaptationlearning.net/sites/default/files/resource-files/IFRI%20publication_2.pdf

Levinger, B. & McLeod, J. (2002). *Hello I must be going: Ensuring quality services and sustainable benefits through well-designed exit strategies*. Newton: Education Development Centre & Center for Organizational Learning and Development.

Lopez, R. & Thomas, V. (2015). Global Increase in Climate-Related Disasters. Asian Development Bank Working Paper Series No. 466. Retrieved from <https://www.adb.org/sites/default/files/publication/176899/ewp-466.pdf>

Macias, K.E. & Rogers, B.L. (2004). Program Graduation and Exit Strategies: Title II Program Experiences and Related Research. Retrieved from <https://www.researchgate.net/publication/24110378/download>

Malik, T. (2015). Recognition of human right to water under international law regime. In *International Journal of Applied Research* , 1(4) pp. 169-172. Retrieved from <http://www.allresearchjournal.com/archives/2015/vol1issue4/PartD/158.pdf>

Marks, S. (2004). The Human right to development: between rhetoric and reality. *Harvard Human Rights Journal*, 17, pp.137-168. Retrieved from https://cdn1.sph.harvard.edu/wp-content/uploads/sites/580/2012/10/spm_the_human_right_development.pdf

Matthew, R.A. & Hammill, A. (2009). Sustainable Development and Climate Change. *International Affairs*, 85(6), pp.1117-1128. Retrieved from https://s3.amazonaws.com/academia.edu.documents/40041904/0c9605367a71e01492000000.pdf20151115-68247-ay2ixi.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1535586169&Signature=A4B8IgeqK4nqUGj8fPDDBJTjhyc%3D&response-content-disposition=inline%3B%20filename%3DSustainable_development_and_climate_chan.pdf

Mkomagi, J. V. (2013). Master's Dissertation: Effectiveness of exit strategies on sustainability of development projects in Tanzania: a case study of selected world vision Tanzania projects. Sokoine University of Agriculture. Retrieved from

<http://www.suaire.suanet.ac.tz:8080/xmlui/bitstream/handle/123456789/471/JEREMIAH%20VEDASTUS%20MKOMAGI.pdf?sequence=1&isAllowed=y>

Mubiru, D.N. (2010). Climate Change and Adaptation Options in Karamoja. Retrieved from http://www.fao.org/fileadmin/user_upload/drought/docs/Karamoja%20Climate%20Change%20and%20Adaptation%20Options.pdf

National Academies of Sciences, Engineering and Medicine. (2016). *Attribution of Extreme Weather Events in the Context of Climate Change*. Washington, DC: The National Academies Press. Retrieved from <https://www.nap.edu/catalog/21852/attribution-of-extreme-weather-events-in-the-context-of-climate-change>

National Planning Authority Uganda. (2013). Uganda Vision 2040. Retrieved from <http://npa.ug/wp-content/themes/npatheme/documents/vision2040.pdf>

Office of the United Nations High Commissioner for Human Rights (OHCHR). (2010). Factsheet No:35 on Right to Water. Geneva: UN Press. Retrieved from <https://www.ohchr.org/Documents/Publications/FactSheet35en.pdf>

OHCHR. (2000). CESCR General Comment No. 14: The Right to the Highest Attainable Standard of Health (E/C.12/2000/4). Retrieved from <http://www.refworld.org/pdfid/4538838d0.pdf>

OHCHR. (n.d.). Human Rights and the 2030 Agenda. Retrieved from <https://www.ohchr.org/Documents/Issues/MDGs/Post2015/HRAndPost2015.pdf>

OHCHR. (n.d.). Summary table on the linkages between the SDGs and relevant international human rights instruments. Retrieved from https://www.ohchr.org/Documents/Issues/MDGs/Post2015/SDG_HR_Table.pdf

OECD. (2015). *The Economic Consequences of Climate Change*. Paris: OECD Publishing. Retrieved from <https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/OECD%20Climate%20Change.pdf>

Peters, K. et.al. (2016). *'Resilience' Across the Post-2015 Frameworks: Towards Coherence?* Working Paper. London: Overseas Development Institute. Retrieved from <https://www.odi.org/sites/odi.org.uk/files/resource-documents/11085.pdf>

Preventionweb. (n.d.). About the Hyogo Framework for Action (2005-2015). Retrieved from <https://www.preventionweb.net/english/hyogo/framework/>

Republic of Uganda. (2007). Uganda National Adaptation Programmes of Action. Retrieved from <https://unfccc.int/resource/docs/napa/uga01.pdf>

Steffen, W. et.al. (2015). The Trajectory of the Anthropocene: the Great Acceleration. *The Anthropocene Review*, 2 (1). Retrieved from <https://openresearch-repository.anu.edu.au/handle/1885/66463>

The Lutheran World Federation (LWF). (n.d.). LWF Uganda Strategy 2015-2020. Retrieved from https://uganda.lutheranworld.org/sites/default/files/documents/uganda_country_strategy_2015-2020.pdf

Ministry of Water and Environment Uganda. (2015). Uganda's Intended Nationally Determined Contribution (INDC). Retrieved from <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Uganda/1/INDC%20Uganda%20final%20%202014%20October%20%202015,%20minor%20correction,28.10.15.pdf>

Ministry of Water and Environment Uganda. (2015). Uganda National Climate Change Policy. Retrieved from <http://www.mwe.go.ug/sites/default/files/library/National%20Climate%20Change%20Policy%20April%202015%20final.pdf>

Thomalla, F. et.al. (2006). Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation. *Disasters*, 30 (1), pp.39-48. Blackwell Publishing. Retrieved from <http://www.geo.mtu.edu/volcanoes/06upgrade/SocialKateG/Attachments%20Used/ReducingVulnerability.pdf>

United Nations. (2015). *The Millennium Development Goals Report Summary 2015*. Retrieved from http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20Summary%20web_english.pdf

United Nations. (1992). United Nations Framework Convention on Climate Change (UNFCCC). Retrieved from <https://unfccc.int/resource/docs/convkp/conveng.pdf>

United Nations.(n.d.) Goal 1: End poverty in all its forms everywhere. Retrieved from <https://sustainabledevelopment.un.org/sdg1>

United Nations.(n.d.) Goal 2:End hunger, achieve food security and improved nutrition and promote sustainable agriculture. Retrieved from <https://sustainabledevelopment.un.org/sdg2>

UN Climate Change Secretariat. (2017). Technical Paper: Opportunities and options for integrating climate change adaptation with the sustainable development goals and the Sendai framework for disaster risk reduction 2015-2030. Retrieved from https://unfccc.int/sites/default/files/resource/techpaper_adaptation.pdf

United Nations General Assembly. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development*, Resolution A/RES/70/1. Retrieved from http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

United Nations Environment Programme (UNEP). (2015). *Climate Change and Human Rights*. Nairobi: UNON Publishing Services Section. Retrieved from https://web.law.columbia.edu/sites/default/files/microsites/climate-change/climate_change_and_human_rights.pdf

UNFCCC. (2015). *The Paris Agreement*. Retrieved from https://unfccc.int/sites/default/files/english_paris_agreement.pdf

UNFCCC. (2011). *Report of the individual review of the annual submission of Canada submitted in 2010*. Retrieved from <https://unfccc.int/resource/docs/2011/arr/can.pdf>

UNFCCC. (2010). *Decision 1/CP.16 Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention: The Cancun Agreements*. Retrieved from <https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

UNFCCC. (2005). *Hyogo Framework for Action*. Retrieved from https://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf

UNFCCC.(n.d.). *What is the Kyoto Protocol*. Retrieved from <https://unfccc.int/process-and-meetings/the-kyoto-protocol/what-is-the-kyoto-protocol/what-is-the-kyoto-protocol>

UNFCCC. (n.d.). *Conference of the Parties (COP)*. Retrieved from <https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop>

UNFCCC. (n.d.) *National Adaptation Programmes of Action*. Retrieved from <https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/introduction>

UNICEF. (2014). *Millennium Development Goals (MDG) Monitoring*. Retrieved from https://www.unicef.org/statistics/index_24304.html

UNISDR. (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030*. Retrieved from https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf

United Nations World Water Assessment Programme & UN Water.(2018). *The United Nations World Water Development Report: Nature-based Solutions for Water*. Paris, UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0026/002614/261424e.pdf>

USAID. (2016). *Uganda Climate Change Vulnerability Assessment Report*. Retrieved from <https://www.climatelinks.org/sites/default/files/asset/document/ARCC-Uganda%2520VA-Report.pdf>

USAID. (2017). *Climate Change Risk In Karamoja Uganda: Climate Screening For Food Security*. Retrieved from

https://www.usaid.gov/sites/default/files/documents/1866/170130_Karamoja_Food_Security_Climate_Screening.pdf

VSL Associates. (n.d.). Reaching the very poor: The need for a new microfinance model. Retrieved from <http://www.vsla.net/>

Wagner, J (Auth.) & Sattelberger, J. (Ed.). (2017). How does the 2030 Agenda relate to human rights?, KfW Development Brief. Retrieved from https://www.kfw-entwicklungsbank.de/PDF/Download-Center/PDF-Dokumente-Development-Research/2017-06-26_EK_SDGs-und-Menschenrechten_EN.pdf

Watt, A. (2014). The Project Life Cycle (Phases). In A. Watt, *Project Management*. Creative Commons Attribution 4.0 International License. Retrieved from <https://opentextbc.ca/projectmanagement/>

World Bank. (2016). The Uganda Poverty Assessment Report 2016, Report No: ACS18391. Retrieved from <http://pubdocs.worldbank.org/en/381951474255092375/pdf/Uganda-Poverty-Assessment-Report-2016.pdf>

World Commission on Environment and Development. (1987). *Our Common Future*. Retrieved from <http://www.un-documents.net/our-common-future.pdf>

World Health Organization (WHO), Hales, S. et.al. (Eds.). (2014). Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: WHO Press. Retrieved from http://apps.who.int/iris/bitstream/handle/10665/134014/9789241507691_eng.pdf?sequence=1

World Health Organization (WHO), Reed, B & Reed, B. (2013). Technical notes on drinking-water, sanitation and hygiene in emergencies No.9 How much water is needed in emergencies. Retrieved from http://www.who.int/water_sanitation_health/publications/2011/WHO_TN_09_How_much_water_is_needed.pdf?ua=1

SITOGRAPHY

<https://www.co2.earth/>

<https://www.pmel.noaa.gov/co2/story/What+is+Ocean+Acidification%3F>

<https://data.giss.nasa.gov/gistemp/graphs/>

<https://grace.jpl.nasa.gov/>

<https://climate.nasa.gov/>

<https://oco.jpl.nasa.gov/index.cfm>

https://data.giss.nasa.gov/gistemp/graphs/graph_data/Temperature_Anomalies_over_Land_and_over_Ocean/graph.txt

<https://www.unisdr.org/we/inform/terminology#letter-v>

<http://www.ipcc.ch/>

<http://www.euro.who.int/en/health-topics/environment-and-health/Climate-change/data-and-statistics>

<https://www.unisdr.org/we/inform/disaster-statistics>

<https://www.preventionweb.net/english/hyogo/progress/>

<https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf>

https://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf

https://www.unisdr.org/files/43291_sendaiframeworkfordrren.pdf

www.sdg.humanrights.dk

<https://ecouganda.org/>

<https://www.un.org/development/desa/dpad/least-developed-country-category.html>

<https://climate.nasa.gov/vital-signs/sea-level/>

<https://climate.nasa.gov/vital-signs/ice-sheets/>

<https://www.livegreen.iastate.edu/take-action/resources/3-facets-in-practice>