

A Review on Policy Change for Climate Change in Ethiopia

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Abstract

For ever and a day, the Troposphere climate has changing but because of human being involvement it is now changing in advance than it has for thousands of years. The reviews summarized works carried out on policy change for climate change in Ethiopian context. So, the main objectives of this paper was Identifying what climate change combating strategies have been developed and implemented, against climate change in Ethiopia. To end the objective all necessary secondary sources were reviewed. Finally it was founded that, Climate change is one of the key problem of our time that create great pressure to our societies. Likely Ethiopia has been identified as one of the country's most susceptible to severe climate .This, severe climate (like, flood and drought) have deep negative influence on agricultural production, which have been a big impediment to the country's economic growth. The incidence of droughts and floods has been identified to lessen growth potential of Ethiopia by more than one third. The Ethiopian Government has put in place combating strategies targeted at reducing the susceptibility of the country to climate change. Unlike the case of industrial countries which are required to alleviate their greenhouse gas emissions, the tangible measure needed from Ethiopia is to adapt to and lessen the influence of climate change through having development responsive national strategies and practical adaptation and mitigation measures.

Keywords: climate change, policy, extreme climate

Introduction

Climate change is directly or indirectly results of human activities that alter the masterpiece of the universal atmosphere in addition to natural climate variability observed over period of time (UNFCCC Article 1, 1992). And also Climate change refers every change in climate in due course of natural variability or as an upshot of human involvements (IPCC 2007).For the last 10,000 years; we have been breathing in a secured climate that permitted entire human progress to happen. The then, (in the mediaeval warming and the Little Ice Age), variation of temperature was no more than 1°C. But currently, the possible sudden changes of temperature receive to be 2°C and 6°. Nobody knows what the world is like with those possible temperatures. We are climbing rapidly out of mankind's harmless zone into new subject that can ignore once live (R.Corell, 2007).

Climate change brought great dilemma on rural poor of third world countries who rely on natural resources for their occupation with inadequate competence to adapt to climate change (UNFCCC, 2007). Long-standing changes in temperature and with severe weather related events are marked in several areas of the world. It has become lucid that tangible activities to mitigate climate change will be inadequate to prevent devastating climate change impacts that pressure on the economic achievement in the third world (USGCRP, 2009).

"The poor and wealthy, women and men, young and old, and people of different social identities or political stripes, experience different risks while facing the same climatic event...the inability to manage stress do not fall from the sky"(Ribot, 2010:49). Accordingly, the concern to climate change became key switch agenda in Ethiopia. There are a number of motives why Ethiopia should be concerned regarding climate change. The country's essential natural wealth such as water; forest, rangeland, agricultural land, biodiversity, energy, etc are mirror image of past climate. Socioeconomic activities such as agriculture (both crop production and livestock herding) and agro-forestry which are the main sources of livelihood to rural majority and backbone of the country's economy are sensitive to climate variant. Periodic drought, unseasonal flood, and livestock and crop diseases are another major problem in Ethiopia (NMA, 2006), and (MoFED, 2010).

Unless adaptation measures are extensively executed, climate change can pull back development success happened in years. Knowing this, the Government of Ethiopia and civil society association have been making considerable efforts to tackle the climate change problem recently. Therefore, this country level assessment report highlights on some of the key climate change related strategies by concern by different organization in the region.

Objectives

The general objective of the study was to assess what climate change combating strategies have been designed and applied in the Ethiopia, against climate change.

Comprehensive evidence for earth's Climate Change

In the year between 1906-2005, global average surface temperatures were amplified by 0.74 ± 0.18 °C (IPCC, 2007a). Based on situation of global air, ocean temperatures, and changes in ice, the IPCC summarized that

climate were warming abnormally (IPCC, 2007a). Since the middle of the 20th century, Most of the warming is due to the human based increasing of greenhouse gas in atmosphere (IPCC, 2007a). At regional level climate change is vary. For instance, the recorded Western European temperature pattern in the past decades was much higher than the global average. Climate change will bring with it increased frequency of natural disasters that affect agriculture and rural households. It will alter temperatures and rainfall patterns, thereby changing farming practices and household behavior (Yamauchi and Quisumbing2009). Current observations prove that many natural systems around the globe are by now are being affected by climate change (Schneider et al., 2007).

Climate trends in Ethiopia

Already, Climate change is happening now, thus past and present change used to signify potential future alteration. Under all scenarios of greenhouse gas emissions, world Climate Models indicate warming projected for all seasons in all section of Ethiopia. Conway and Schipper (2011) using the medium high SRES A2 emissions scenario show an annual warming throughout Ethiopia of 1.2°C by the 2020s with a range of 0.7-2.3°C, and warming of 2.2°C with a range of 1.4-2.9°C by the 2050s. Regional differentiation in warming are modest, with warming associated with a greater frequency of heat waves and increases in evaporation leading to moisture deficits. Elshamy et al. (2009) show a temperature increase over the upper Blue Nile between 2°C and 5°C at the end of the 21st Century under the A1B scenario compared to the period 1961-1990.

Seleshi and Camberlin (2005) scrutinize trends in severe of seasonal rainfall over the period 1965-2002 with declining trends found for Kiremt (main rainy season between June- September) and declining trends in extreme rainfalls in Belg (small rainy season from March - May). From the majority of studies, the most outstanding trend has been towards reduced rainfall records with the main growing season length (March-May) throughout much of eastern Africa declining by roughly 15 percent since the 1980s.

Table 1 Climate trends in Ethiopia

		Temperature	Rainfall	Extreme Events
1	Historical trend	Mean temperature increased by 1.3°C from 1960 - 2006 More hot days and nights, fewer cold days and nights	Highly variable from year to year, season to season, decade to decade No significant trend	Regular severe flood and drought events No evidence of changes in frequency or intensity of extremes
2	2020s	+ 1.2 °C (0.7 - 2.3°C)	+0.4%	Greater increases in rainfall in Oct-Dec, especially in the south and east.
3	2050s	+ 2.2 °C (1.4 - 2.9°C)	+1.1%	Heavier rainfall events. Uncertain future El Nino behavior brings large uncertainties.
4	2090's	+ 3.3 °C (1.5 – 5.1°C)	Wetter conditions	Flood and drought events likely to increase Heat waves and higher evaporation

Source: Conway and Schipper 2011

Vulnerability to climate change in Ethiopia

Ethiopia is specifically susceptible to climate change because of its setting and less adaptive ability. Changes in temperature and rainfall patterns and variability are likely to increase the frequency of severe droughts and floods, which will subsequently have a negative impact on human and livestock health, food security, and land degradation (IFPRI,2008) and (EEA and EPRI, 2010). In general, Ethiopia has been identified as one of the country's most susceptible to climate variability and change, and is frequently faced with climate-related hazards, commonly drought and floods. Oxfam estimates that drought costs Ethiopia roughly\$1.1bn a year – almost eclipsing the total annual overseas backing the country (Oxfam International, 2009)

Table 2 Susceptibility to climate change in Ethiopia

Section of country	Rain fall pattern	Livelihood activities	susceptibility
1) Northeast	March-September rains have declined significantly since the mid-1990s	Primarily pastoral, some cropping and agro-pastoral zones towards the south	Disaster risk trend: Potential increase in drought risk, which could affect migration patterns of Afar pastoralists into cropping areas and exacerbate conflict. Income sources: High reliance on livestock sales. Livestock could decrease in quantity and quality if availability of pasture decreases as a result of lower rainfall. Food sources: Households across all wealth groups depend on markets. Food price increases could be linked to climate variability, and could have a negative impact on these households. Households also depend on their own milk and meat production, which could decrease in quantity and quality if pastures become limited.
2) Northwest	March-September rains have remained relatively constant, and appear to be increasing	Cropping	Disaster risk trend: Potential increase in flood risk. Income sources: High reliance on crop sales, labor migration, and agricultural labor. Availability of agricultural labor is linked to climate trends, so erratic rainfall could affect the poorest households that depend on this type of labor. Food sources: Poorest households depend on market for over half of their food. Food price increases could be linked to climate variability, and could have a negative impact on these households.
3) Southeast	Rainfall has been declining constantly since the 1980s, with the last few years being particularly dry	Primarily pastoral, some cropping and agro-pastoral in the northernmost parts of this region and along the rivers	Disaster risk trend: Potential increase in drought risk, associated with a northwestward retreat of be grains. Drought risk could also be linked to higher incidence of livestock diseases. Income sources: High reliance on livestock sales and self-employment. Livestock could decrease in quantity and quality if availability of pasture decreases due to lower rainfall. Food sources: Households across all wealth groups are especially dependent on markets. Food price increases could be linked to climate variability, and could have a negative impact on these households.
4) Southwest	Rainfall has been declining steadily since the 1960s, and this trend has accelerated since the mid-1990s	Cropping and agro-pastoral	Disaster risk trend: Potential increase in drought risk associated with a northwestward retreat of both belgand meherrains. Income sources: High reliance on crop sales and agricultural labor. Crop production could decrease as a result of lower rainfall. Availability of agricultural labor is linked to climate trends, so erratic rainfall could affect the poorest households that depend on this type of labor. Food sources: Poorest households depend on markets and food assistance. Food price increases could be linked to climate variability, and could render these households increasingly dependent on food assistance.

Oxfam International, (2009)

Drought risk is one of the key drivers of food insecurity in Ethiopia. Since 1950, twelve major drought-induced food security crises have occurred (Table 3), highlighting the sensitivity of food security to climate-related risks. As Woldeamlak (2009) mentions, once every three or four years is a drought year in Ethiopia all of which affect food security.

Table 3 Chronology of drought-related food security crises since 1950 in Ethiopia

Year	Major incidences
1953	<i>Food security crisis in Wollo and Tigray.</i>
1957-58	<i>Food security crisis in Tigray, Wollo, and south-central Shewa. About 1 million farmers in Tigray might have been affected, with about 100,000 being displaced.</i>
1962-66	<i>Many parts of the northeastern Ethiopia suffered from droughts and Food security crisis. Tigray and Wollo were severely hit.</i>
1973-74	<i>This was one of the most significant food security crises which affected parts of eastern Harare, SNNPR and the Bale lowlands. About 100,000 to 200,000 people died as a result of this extensive crisis.</i>
1977-78	<i>Most parts of the Wollo were severely hit by food security crisis owing to erratic rainfall, pest damage, and frost actions. About 500,000 farmers were affected.</i>
1984-85	<i>Most parts of Ethiopia including relatively food secure areas like Walaita, Kambata and Hadiya were affected by severe food insecurity. Drought and crop diseases were the main drivers of the food security crisis in this case. It is estimated that over 1,000,000 people died.</i>
1987-88	<i>Tigray, Wollo and Gonder were severely affected due to drought and civil wars.</i>
1990-92	<i>Rain failure and regional conflicts resulted in approximately 4,000,000 people being affected.</i>
1993-94	<i>Widespread food insecurity, but few deaths or cases of displacement were reported because of early responses by the government and international aid organizations.</i>
2003-04	<i>Over 13 million people affected, but the response mitigated the worst potential outcomes.</i>
2008-09	<i>Almost 3 million people were affected.</i>
2011	<i>Severe food security crisis occurred in the southeastern lowlands. This was linked to unprecedented drought.</i>

Source: Compiled from (Webb et al. 1992),(World Bank 2006 and 2009), (Markos 1997), and (Cochrane, 2011)

Main livelihood a vulnerable to climate change in Ethiopia

The National Adaptation Programme of Action (NMA, 2007) recognized the most susceptible sectors to climate change both small-holder rain fed farmers and pastoralists were found to be the most susceptible populations, while the arid, semi-arid and dry sub-humid areas of the country were recognized as the most likely to be affected by drought. Table 6 summarizes the different impacts and susceptible sectors identified by the NAPA.

All of the rural livelihoods of Ethiopia are based on crop cultivation, pastoralism, and agro-pastoralism which are highly sensitive to climate and are vulnerable to hazards in multiple ways. Since climate change has strong relationship to poverty and social inequality, its impacts will be felt in different ways and severities by different communities and social groups in Ethiopia. It is well documented that the most vulnerable and marginalized communities and groups are those who will practice the greatest influence (IPCC, 2007), and are in the greatest need of support and adaptation approach. At the same time, it is the vulnerable and marginalized who lack or have the least access to information, technology or chance to adapt to present climate variability and adequately prepare for future changes in the climate system. Particularly, climate change poses a significant challenge to the lessening of poverty and social inequality for the rural poor, especially women, the marginalized, the disabled and those living with HIV/AIDS, who will suffer excessively from its many-sided and growing impacts. Table 4 summarizes the sensitivities of the major livelihood systems, as well as the major climate-related hazards.

Table 4 Climate sensitivities of key livelihood systems

<i>Livelihood systems and sensitivities to climate-related shocks</i>	<i>Major climate-induced hazards and impacts on livelihoods systems</i>	
<p>Crop Cultivation</p> <p><i>Rainfall determines crop output and availability of animal feed. Scarcity, variability, and excess rainfall all affect agriculture. Erratic rainfall patterns could reduce the length of the growing season as well as yields, with negative impacts on incomes and food security.</i></p>	<i>Rainfall</i>	<i>Changes in rainfall patterns affect the quantity and quality of water available for cultivation. Erratic rainfall patterns could reduce the length of the growing season as well as yields, with negative impacts on incomes and food security.</i>
	<i>Temperature</i>	<i>Extremely low temperatures in the highlands result in frost damage. Frost affects crops and reduces yields. Extremely high temperatures in the lowlands affect agricultural productivity.</i>
	<i>Flooding and water logging</i>	<i>Unseasonal heavy rainfall in some parts of the country damages crops. Flooding also results in animal losses, which can adversely affect livelihood assets.</i>
<p>Pastoralism</p> <p><i>Rainfall affects the availability of animal feed and water for livestock rearing. Changes in rainfall patterns will likely affect the quantity and quality of water available for livestock consumption. This would affect livestock health, with potential impacts on the quality of meat and milk. Erratic weather patterns could also render livestock more vulnerable to diseases.</i></p>	<i>Rainfall</i>	<i>Changes in rainfall patterns will likely affect the quantity and quality of water available for livestock consumption. This would affect livestock health, with potential impacts on the quality of meat and milk. Erratic weather patterns could also render livestock more vulnerable to diseases.</i>
	<i>High Temperature</i>	<i>Extremely high temperature in pastoral parts of the country is a critical challenge to livestock productivity.</i>
	<i>Livestock diseases</i>	<i>Erratic weather conditions render livestock more vulnerable to diseases. Livestock diseases such as trypanosomiasis, African Horse Sickness and epizootic lymphangitis are endemic to the pastoral areas in Ethiopia, and can be highly fatal. Animal losses often have negative impacts on livelihoods.</i>
<p>Agro-pastoralism</p> <p><i>Both cultivation and pastoralism are affected by rainfall variability, as highlighted above. Changes in rainfall patterns could affect crop output, as well as the availability of water and food for livestock.</i></p>	<i>Climate variability</i>	<i>Agro-pastoralists are vulnerable to the same risks as agricultural and pastoralist households. Rainfall variability (both spatial and temporal), flooding, extreme temperatures, and livestock diseases severely affect agro-pastoral livelihoods</i>

Source: CSA, (2014)

Main climate hazards affecting Ethiopia

Climate-related shocks such as droughts and floods affect the ability of households to meet their food necessities, and can direct to food uncertainty. Climate related hazards documented as affecting Ethiopia comprise drought, floods, heavy rains, strong winds, frost and high temperatures (NAPA, 2007). The most significant hazards are drought and floods. Ethiopia has mainly dry, sub-humid, semi-arid and arid regions, all of which are prone to recurrent drought and desertification. Since the 1970s the severity, occurrence and impacts of drought have increased and the areas affected by drought and desertification are intensifying (World Bank, 2009). A participatory study in the pastoral areas of Borena and Shinile zones also showed how populations of all genders and ages graded drought as the major climate hazard affecting their lives. Extreme heat is also cited as a significant hazard (Riché et al, 2009).

Spark floods and seasonal river floods are also becoming increasingly common. Major floods, which caused loss of life and property, happened in different parts of the country in 1988, 1993, 1994, 1995, 1996 and 2006 (NAPA, 2007). spark floods can happen in most of the country, while large scale flooding is restricted to

the lowland areas of the country. Severe rainfall in the Highlands can also root flooding of settlements in a number of river basins, specifically the Awash River basin in the Rift Valley (World Bank, 2009).

Policy change for climate change

Policy change and its determinants have been on the research agenda among scholars in recent years. Researchers in the area of public policy try to understand why public decisions and their results change stay stable and differ in their outcomes for the public (John 2003). Public policy, on the other hand, tends to include in its base political activity and institutions from parties, legislatures, political cultures, international agencies, local governments to the citizens who give certain feedbacks on public policies. Moreover, decision-making process is the major contribution of public policy studies, but as well complicates the task at hand. Varied theoretical frameworks and many studies have contributed to an extended knowledge of reasons and causes for policy change (Sabatier, 1999).

Accordingly, world leaders disable to form policy change for climate change as wanted with full confidence to implements till now. The countries and communities that are most at risk from its impacts, and are least able to adapt, are those that have contributed least to the problem. If poorer nations pursue economic growth by the same means from which the industrialized nations have benefitted, such as by burning coal and clearing forests, they will only add to the climate change problem. Indeed, the richest nations insist that all nations including the poorest ones should act to limit climate change, but when the poorest nations ask the richer ones for help to do so, they don't get the finance and technology they need in return.

The international dialogue on climate change are themselves unfair, as some countries wield considerable power while others have little to bring to the table other than moral arguments. The more vulnerable nations can do little when industrialized nations fail to act to limit climate change, or even break promises they have made in the past. And when the richer nations provide 'climate finance' in the form of loans not grants, they are in effect asking poorer nations to pay to fix a problem the richer nations created. There is also inequity with countries, as it is the poorest communities that are most vulnerable to climate change. yet again, these tend to be the people who have done least to contribute to the problem.

The Global Policy Forum for climate change

In 1979, climate change was recognized as a severe problem through the First World Climate Conference geared toward assessment of potential impacts of climate change (and not, at this stage, toward policy development). Participants issued the Declaration of the World Climate Conference, calling on the world's governments to foresee and prevent potential man-made changes in climate that might be adverse to the well-being of humanity. The meeting also put forth a plan to explore climate processes and potential impacts. This was done by a jointly administered World Climate Programme (WCP) under the backings of the WMO, the United Nations Environment Programme (UNEP), and the International Council of Scientific Unions (ICSU). From this start, a number of climate change conferences were held at the intergovernmental level over the course of the 1980s. In 1988, UNEP and the WMO established the Intergovernmental Panel on Climate Change (IPCC) to assess the scientific, technical and socio-economic information relevant for the understanding of the risk of human-induced climate change. The IPCC does not, according to its mandate, conduct original research, nor monitor climate related data. Instead, it draws assessments from published and peer reviewed scientific technical literature. In 1990, the IPCC published its First Assessment Report, which purified and

Presented the scientific evidence of human-induced climate change, and in large part prompted the Second World Climate Conference to call for a framework treaty on climate change. Later that same year, the UN General Assembly launched the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (FCCC) to begin the process of shaping the treaty.

In May of 1992, the UNFCCC was adopted, and at the Earth Summit, it was signed by 154 states and the European Commission. From the very beginning of the intergovernmental climate change discussions, civil society organizations have operated in parallel. Their primary focus was, and continues to be, to raise awareness around the issue and to influence policy-makers toward decisive action. CSOs, and NGOs in particular, were present in force in Rio and are thought to have significantly influenced the Earth Summit. Around the issue of climate change, these groups have subsequently increased in size, number, level of activity and degree of integration.

In 1995, the IPCC concluded and out its second assessment Report. The findings provided critical input into the negotiation process which would yield the Kyoto Protocol. In Kyoto, the Third Conference of the Parties (COP) to the FCCC proved to be difficult and lengthy negotiation process, wherein legally binding greenhouse gas reduction targets were created. The Kyoto Protocol was, and has remained, an extremely significant and controversial policy construct for this very reason. In the end, the industrialized country Parties adopted differentiated GHG emissions reduction targets for the first commitment period (2008-2012) which represented, on average, roughly 5 percent cuts (Ott, 1998). Not least among its controversial attributes, the Kyoto Protocol

introduced a set of mechanisms - the Clean Development Mechanism, Joint Implementation and Emissions Trading - designed to enable countries to achieve its targets through the most cost effective combination of projects. These were initially known as “flexibility instruments” and later as “Kyoto mechanisms”. Initially promoting a cautious and in some instances, skeptical and openly hostile approach to the negotiations, business groups were seen as particularly strong during the Kyoto process. In recent years, however, and likely due to mounting public pressure, a business sector shift has been seen, with multinational corporations defecting from more conservative lobbying groups and joining more moderate associations. In the years since its adoption, negotiations have focused on working out the policy details of the Kyoto Protocol, particularly those surrounding the flexibility mechanisms. Civil society and the NGO community have played a critical role in producing policy research and recommendations. Despite intensive input, though, COP 4, held in Buenos Aires, 1998, and COP 5, held in Bonn the following year, are seen by many to have foundered in a sea of policy minutiae with little real consensus emerging. Of even greater disappointment, the much-anticipated COP 6, held in The Hague, November 2000, ended in stalemate as the EU and JUSCANNZ came to loggerheads over issues such as carbon sinks in the CDM. Though expected to restart soon, the failure of the most recent talks highlights the policy complexity and political faultlines that continue to challenge the climate change policy-making process.

At the heart of the climate change policy arena is the UN Framework Convention on Climate Change. The UNFCCC, coordinated by a Secretariat based in Bonn, Germany, is the forum within which the Parties convene to negotiate the rules which will guide global efforts to address climate change. The Framework Convention itself initially set forth only general guidelines; in 1997, the Kyoto Protocol (KP) set out the basic design of mechanisms for meeting the Parties’ obligations. As such, actors engaged in subsequent climate change negotiations have focused intensively on the Kyoto Protocol.

The map provided below shows the Kyoto Protocol at the heart of climate change policy arena and as the target of the majority of actors who aim to influence policy. As with all UN treaties, it is only the Parties to the UNFCCC (nation states) that can actually negotiate the specifics of the Kyoto Protocol; non-party actors aim instead to influence the position taken by Parties and, thereby, the policy outcome. Therefore, nation states act as intermediaries’ vis-à-vis other actors.

Comparison of Ethiopia and selected countries in domestic and international ambition to manage climate change

In the process of shaping an agreement where multiple parties are involved, alliances are inevitably forged around specific policy positions. Given the nation-state focus of the climate change domain, the critical alliances are among nation groups. Of course these are derived to varying degrees from powerful sectoral constituencies within a state. In the climate change arena, alliances between parties have been politically expected, though the extended inflexibility of positions taken is of interest. In general terms, the Parties have joined along developed country and developing country lines. Within these groupings, however, specific alliances exist. Perhaps more than in other policy arenas, these alliances have proven pivotal to the patterns and pace of the negotiations.

Table 5: Comparison of domestic and international ambition in selected countries

Country and negotiating group	Mitigation ambition of domestic legislation	Ambition in international negotiations (2020 pledge)
Australia (Umbrella Group)	Medium 80% below 2000 levels by 2050 Clean Energy Act passed in 2011; carbon tax introduced with emissions trading by 2015 and linking with EU Emissions Trading Scheme (ETS) by 2018. Longevity of legislation to a large extent will depend on outcome of the 2013 election	Low to Medium 5–25% below 2000 levels based on actions by other states (5% unconditional, 15% if global agreement with insufficient ambition, 25% if global agreement consistent with stabilization at 450 parts per million carbon dioxide equivalent (450ppm CO ₂ e) or lower)
Canada (Umbrella Group)	Low No climate legislation after repeal of the Kyoto Implementation Act in 2012	Low 17% below 2005 levels by 2020; withdrew from the Kyoto Protocol in 2012
Chile (AILAC)	Low No mitigation targets in domestic legislation	High 20% below business-as-usual (BAU)
Colombia (AILAC)	Low No mitigation targets in domestic legislation	Medium Unilateral target of 77% share of renewable energy in national energy mix and zero deforestation in Amazon basin
Ethiopia (G77 plus China)	High Limiting 2030 emissions to 2010 levels (approximately 70% below BAU) under the Climate Resilient Green Economy Initiative	Medium Action in renewable and alternative energy, transportation; waste, agriculture, forestry and land sectors
Japan (Umbrella Group)	Low No comprehensive climate legislation for post-2012	Medium 25% below 1990 premised on the establishment of a fair and effective international framework involving all major economies; not participating in the second commitment period of the Kyoto Protocol
Mexico (Environmental Integrity Group)	High General Law on Climate Change passed in 2012 putting into legislation a target to reduce greenhouse gas emissions by 30% below BAU by 2020 subject to international support	High 30% below BAU conditional on financial and technical support
Russia (Umbrella Group)	Low Climate Doctrine sets out framework for action but no targets specified	Low Domestic target to reduce emissions by 15–20% from 1990 levels by 2020 (already achieved after economic collapse in 1990s) Not participating in the second commitment period of the Kyoto Protocol
South Korea (Environmental Integrity Group)	High Passed Framework Act on Low Carbon Green Growth in 2010, creating legislative framework for mid- and long-term targets, cap and trade, carbon tax and expansion of renewable energy	High 30% below BAU
UK (EU)	High Climate Change Act puts into law target to reduce emissions of GHGs by at least 80% from 1990 levels by 2050. Fourth carbon budget legislates for 50% cut by 2027	Medium UK negotiates as part of EU27. EU's 2020 pledge is 20% below 1990, moving to 30% in the event of comparable action by others
US (Umbrella Group)	Low. So far failed to pass comprehensive climate change legislation; beginning to regulate CO ₂ under existing provisions in the Clean Air Act, but proposed regulations may be subject to lengthy legal challenge	Low. “In the range of 17% below 2005 levels” dependent on passing national legislation Did not ratify the Kyoto Protocol and is advocating non-legally binding framework for post-2020

Source: IPCC, (2013)

Inclusive Environmental Consciousness and determinations of Ethiopia in having climate policy

“Under the late Prime Minister MelesZenawi, Ethiopia was at the forefront of Africa’s climate policy development. Established under his leadership, the country embarked on a Climate Resilient Green Economy (CRGE) initiative, a key plank in the wider and even more ambitious Growth and Transformation Plan, GTP”(MoFED, 2010).

Determined enough to combat climate change, Ethiopia has suitably reacted by ratifying relevant international conventions and is taking the necessary steps to implement. Like most countries, Ethiopia adopted its current environmental laws under the influence of increased global environmental awareness that came in the wake of the Stockholm Conference in 1972, the WCED report in 1987, and the United Nations Conference on Environment and Development (“UNCED”) in 1992 (Nicholas, 2002). The WCED and UNCED specifically called on donors to help developing countries establish the national legal infrastructure for environmental protection. Before the fall of Ethiopia’s communist government, the process of developing a National Conservation Strategy was begun with international help from the World Conservation Union (IUCN) (James Keeley, 2000). This process continued under the new government (of the Ethiopian Peoples’ Revolutionary Democratic Front, or EPRDF) (Jonathan Mckee et al., 2007)

Similar to the development of formal environmental agencies, most of the environmental laws in place today in Ethiopia were developed after a national backlash removed Derg regime policies that were perceived as authoritarian (Bekele, 2008). According to Dantie, (2011), within Ethiopia a separate enactment of environmental laws is a recent phenomenon in the history of making laws, although some earlier laws had dealt with environmental matters directly or indirectly. The majority of the environmental laws in effect today were developed after the transfer of power to the EPRDF in 1995 (Bekele, 2008).

After the Derg regime, a breadth of environmental legislation was written addressing many environmental sectors. Beginning as early as 1994 with the Water Policy Law, until the more recent 2007 Wildlife Policy, a number of sectoral policies were written, covering areas such as forests, conservation, rural land use, and impact assessment, among others. The strength of these policies varies significantly: some, like the Environmental Policy of Ethiopia (EPE) and its predecessor the Conservation Strategy of Ethiopia (CSE), are widely regarded as well-written, comprehensive environmental policies (Bekele, 2008). Issued in 1997, the current federal environmental policy, the EPE, spans numerous sectoral policies and various cross-sectoral policies (Bekele, 2008). This policy, unlike those of previous regimes, addresses implementation principles, evaluation, and policy review, and explicitly recognizes a role for participatory management.

Attention and Efforts of Ethiopia against climate change in having National policy

Climate change represents a significant threat to Ethiopia. Drought-induced food, water and energy insecurity are already recurrent problems. These punish the worse-off and most vulnerable. Also, climate change poses a serious threat to the alleviation of poverty and the attainment of development plan of Ethiopia. In terms of policy, unlike the case of developed countries which are compelled to mitigate their greenhouse gas emissions, the practical measure expected from Ethiopia is to adapt to and mitigate the impacts of climate change through the development of responsive and nationally appropriate policy and practical adaptation and mitigation measures while lobbying for international solidarity, equity and climate justice. Accordingly, Ethiopia has ratified the UNFCCC (1994) and its related instrument, the Kyoto Protocol (2005), and submitted its initial national communications (in 2001) and National Adaptation Program of Action (NAPA) (in 2007) to the UNFCCC. The country has also submitted its Nationally Appropriate Mitigation Action (NAMA) plan to the UNFCCC by the end of January 2010. And also the country has developed program for action Ethiopian Program of Adaptation to Climate Change (EPACC), which replaces the project-based NAPA, and also developed overarching framework and national strategy called Climate Resilient Green Economy (CRGE).

The Government of Ethiopia has promulgated a five year (2010/11-2014/15) development plan, known widely as Growth and Transformation Plan (GTP) which directly addresses climate change and environment issues in a separate section. Other than the GTP, the various national policies, initiatives and sectoral programs now in place also address climate change, albeit indirectly. Such policy and program initiatives include the Environmental Policy, Energy Policy and the Biofuels Strategy, Agriculture and Rural Development Strategy, Water Resources Management Policy, Strategy and Program, Health Policy, National Policy on Disaster Prevention and Preparedness, National Policy on Biodiversity Conservation, the Pastoral Policy, and the recently introduced National Development Plan for Ethiopian Women, Children and Youth. Some of these policies have been amended from their initial versions while others are still in their original forms despite new realities on the ground.

Table 6: Climate Change Related Policies and Programs of Ethiopia

Policy /strategy	Climate change relevant components in the policy/strategy
Environmental Policy (1997)	Provide overall guidance in the conservation and sustainable utilization of Ethiopia's environmental resources Promote environment monitoring programs Foster use of hydro, geothermal, solar and wind energy so as to minimize emission of greenhouse gases Provide coordination and leadership support in the conservation and management of environmental resources Consider climate change as a cross-cutting and important environmental, social and development challenges that needs to be tackled
EPACC	Adequately captured the growing threat of climate change in Ethiopia and clearly spells out the need to mainstream climate
Adaptation to Climate Change	Change in all spheres of development policy making and planning at all phases and stages of the planning and implementation process. The program clearly states the urgency of taking practical adaptation and mitigation actions in the various social and economic sectors. However, the role of non-state actors in the planning, design and implementation of activities mentioned in the work program is not clearly spelled out.
Ethiopian NAMA	Paid special attention to unleashing the huge potential of the country's water, land, wind and geothermal energy resources for the purpose of generating electricity for road and rail transport and household consumption, and managing urban wastes. Failed to include important mitigation actions in land use planning, energy efficiency, fiscal incentives and traffic management regulatory policy measures.
CRGE	Recommend the use of low carbon solutions to leapfrog other economic sectors while realizing the ambitions set out in the country's Growth and Transformation Plan Present an overarching framework to marshal a coherent response to climate change, to generate both innovative thinking and a course of actions to meet the challenges associated with the transfer of climate-friendly technologies and finance for the construction of a climate resilient green economy in Ethiopia
GTP	Climate change is recognized as a huge threat and opportunity for Ethiopia; Both climate change adaptation and mitigation issues considered; Stipulates the country's ambition to build a climate resilient green economy by 2030.
RDPS (Agricultural and Rural Development Policy Strategies)	Sustainable Land Management Program (SLMP) as a tool to reduce rural vulnerabilities and building ecosystem resilience Environmental rehabilitation Watershed development for environmental adaptation Harnessing the multiple benefits of water resources Integrated disaster risk monitoring and early warning Use of improved agricultural inputs and modern technologies
Energy policy & Biofuels Strategy	Support energy diversification and the development of modern (renewable) energy sources Hydro-power generation Recommend biofuel development as important strategy for energy security and climate change mitigation However, the focus is on hydro- and bio-energy sources
Water Policy	The water sector policy instruments do not factor climate change as a major variable affecting the amount, distribution and quality of water resources. But, they suggest as important; - Water harvesting and management measures - Flood management - Promotion of equitable water for multiple uses
Women's Policy (1993)	Recognize the critical role and contribution of Ethiopian women to poverty reduction and sustainable development Fail to address the gender dimensions of climate change
Health Policy (1994)	Focus on health promotion and disease prevention, curative and rehabilitative services, public health emergency preparedness Prioritize the prevention of environmental pollution with hazardous chemical wastes and the development of environmental health Focus containing and controlling malaria Climate change not considered as a major public health threat

Source: MoFED, (2005) and *Epsilon* International (2011)

Key National development plans and policy for climate change in Ethiopia

Ethiopia has set out its development objectives in a series of national development plans, and these documents shape programming at both federal and regional level. Development plans have traditionally focused on poverty eradication and economic growth, starting with the Sustainable Development and Poverty Reduction Programme

(SDPRP) from 2002 to 2005, and the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) from 2005 to 2010. More recently, the Government is implementing development through the Growth and Transformation Plan (GTP). The GTP aims to support Ethiopia in achieving middle-income country status by 2025 and the MDGs by 2015. The GTP differs from previous plans by including climate change as a cross-cutting issue within the strategic priority of 'environment and climate change' and seeks to create a 'climate resilient green economy' (CRGE). The CRGE approach is presented as a means of reducing development losses caused by climate change impacts, securing economic interests (particularly energy security) and moving towards sustainable production models. CRGE is also being integrated into the next development plan – GTP II. The Ethiopian Government has put in place a number of policies, strategies and programs aimed at reducing the vulnerability of the country to climate variability and change. The government ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. Early programmes included the Environmental Policy of Ethiopia (1997) and the National Action Plan to combat desertification and mitigate the effects of drought (1997). The National Environmental Policy (2002) provides the overarching policy framework for climate change considerations, and includes provisions on monitoring climate impacts, controlling GHG emissions and promoting renewable energy. The Environmental Protection Agency was responsible for the institutional response before this mandate was taken up by the Ministry of Environment and Forests (MoEF). The 5-year Medium-Term Development Plan of 2005 entitled *A Plan for Accelerated and Sustained Development to End Poverty (PASDEP 2005-2010)*, identified that atmospheric pollution and climate change are the cause of considerable environmental and socio-economic problems (MoFED, 2005). Work began on specific climate change strategies and programmes in 2007, with the development of the National Adaptation Program of Action (NAPA).

Impacts caused by increased weather variability include droughts and floods leading to the loss of pastureland, heightened food insecurity and environmentally-related health problems. Intervention measures proposed by the 5-year plan included developing a national strategy to enhance coping mechanisms regarding the adverse impacts of climate change and launching environmentally sound investment and other programs that foster cleaner development, including carbon emissions trading.

The present 5-year Medium-Term Development Plan entitled *Ethiopia's Growth and Transformation Plan (GTP) (2010/11-2014/15)* has the objective of securing growth so that the country reaches middle income status by 2025 (MoFED, 2010). The plan emphasizes the enforcement of existing environmental laws as priority actions in connection with environmental conservation and climate change. The formulation and implementation of climate change adaptation and mitigation programs are also highlighted as priority activities.

Further programs include Nationally Appropriate Mitigation Actions (2010), the Ethiopian Program of Adaptation to Climate Change (2010), the CRGE Vision and Strategy (2011), and the New Energy Proclamation (2013). Broadly, these policy documents together articulate the country's objectives around climate resilience and a green economy.

Conclusion

Climate change is a truth. It has occurred and prolongs to occur and its causes are known. It may, however, not be easy to reverse, the link between climate change, law, sustainable development and people's livelihoods is least understood and addressed by policymakers and legislators, and despite it being a reality. The gap between actual knowledge of the relationship between these variables and the government's continued urge to improve people's Livelihoods by encroaching on vital and culturally sacrosanct natural resources impacts negatively on climate change. The intention to improve livelihoods through law will never be achieved because this will not come about until human activity, which is driven by the laws put in place by the government, focuses more on improving climatic patterns rather than affecting them negatively. One of the main characteristics in expressions of climate threat in Ethiopia is that mutually droughts and floods can occur in the same growing season, with potentially frightening impacts on crop and livestock production. Strategies to tackle climate threat should target on developing capacities to better analyze and predict threats.

Reference

- [1] AfDB (2011) Climate Change Action Plan, 2011-2015. Quality Assurance and Results Department (ORQR). African Development Bank, Tunis.
- [2] Antle, J. (2010) Adaptation of Agriculture and the Food System to Climate Change: Policy Issues. Issue Brief 10-03. Washington, DC.
- [3] Bekele, E. (2008) Status of extreme poverty and hunger in pastoral areas of Ethiopia: Looking forward and inward. In S. Adi and D. Temesgen (Eds.), *Millennium Development goals and pastoral development: Opportunities & challenges in the new Ethiopian millennium*. Proceedings of the Fourth National Conference on Pastoral Development in Ethiopia (pp. 92-108). Addis Ababa: PFE.
- [4] Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A. & Medany, M. (2007) Africa, *Climate Change*

- Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. In: Parry, M. L., Canziani, O. F., Palutikof, J. P., van der Linden, P. J. & Hanson, C. E. (eds.). Cambridge, UK.*
- [5] Carter, M. R., Little, P. D., Mogue, T., & Negatu, W. (2007) Poverty Traps and Natural Disasters in Ethiopia and Honduras. *World Development*, 35(5), 835–856. doi:10.1016/j.worlddev.2006.09.010
- [6] Central statistical agency (2014) Comprehensive Food Security and Vulnerability Analysis (CFSVA). Ethiopia. This report and a summary report are available online: <http://www.csa.gov.et> <http://www.wfp.org/food-security/>
- [7] Conway, D., & Schipper, E. L. F. (2011) Adaptation to climate change in Africa: Challenges and opportunities identified from Ethiopia. *Global Environmental Change*, 21(1), 227-237.
- [8] Conway, G. (2009) The science of Climate Change in Africa: Impacts and Adaptation. Discussion paper No 1. Grantham Institute for Climate Change. Imperial College London. Available at: www.elsenburg.com/trd/globalwarm/downloads/science.pdf [Accessed June 20, 2016].
- [9] Elshamy, M. E., Seierstad, I. A., & Sorteberg, A. (2009) Impacts of climate change on Blue Nile flows using bias-corrected GCM scenarios. *Hydrology and Earth System Sciences*, 13(5), 551-565.
- [10] GLOBE International and the Grantham Research Institute on Climate Change and Environment, (2014). What Makes Effective Climate Legislation. Consultation paper. In: GLOBE International, *2nd World Summit of Legislators*. Mexico City, Mexico, 6-8 June 2014. London: GLOBE International and the Grantham Institute.
- [11] Intergovernmental Panel on Climate Change (2007) *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of working Group II to the Fourth Assessment Report of Intergovernmental Panel on Climate Change* Cambridge, UK, Cambridge University Press.
- [12] Intergovernmental Panel on Climate Change (2007) Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva. Available at: <http://www.ipcc.ch>. [Accessed June 20, 2016].
- [13] Intergovernmental Panel on Climate Change (2007) *IPCC Fourth Assessment Report: Climate Change 2007. Working Group 1. 11.2, Africa.*
- [14] Intergovernmental Panel on Climate Change (2007): Summary for policymakers, in: M. Parry et al. (eds.), *Climate change 2007: impacts, adaptation and vulnerability: contribution of working group II to the fourth assessment report of the IPCC*, Cambridge: Cambridge University Press, 7–22
- [15] Intergovernmental Panel on Climate Change (2007a) Summary for Policymakers. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, (eds.), Cambridge University Press, Cambridge, UK, 7-22.
- [16] International Labor Organization (2011) Environment and employment: A DySAM assessment of the potential employment and social dimension of the reduction of Co2 emissions in Mozambique, C. Ernst and A. Iturriza, Joint paper by the Employment Intensive Investment (EIIP) and the Green Jobs Program for the 14th ILO Regional Seminar for Labour Based Practitioners, Accra, 5-9 September 2011.
- [17] IPCC (2007b) Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson (eds.), pp. 732, Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- [18] Markos, E. (1997) Demographic Response to Ecological Degradation and Food Insecurity in Drought Prone Areas in Northern Ethiopia. Ph.D. Thesis, The University of Groningen.
- [19] McSweeney, C., New, M. & Lizcano, G. (2008) *UNDP Climate Change Country Profiles: Ethiopia* New York: United Nations Development Programme (UNDP).
- [20] Ministry of Finance and Economic Development (2010) Federal Democratic Republic of Ethiopia – Growth and Transformation Plan 2010/11-2014/15, Volume I: Main Text, Addis Ababa, Draft World Bank (2006) Ethiopia
- [21] Ministry of Finance and Economic Development (2005). Ethiopia: Building on Progress. A Plan for Accelerated and Sustained Development to End Poverty (PASDEP). Addis Ababa, Ethiopia.
- [22] Ministry of Finance and Economic Development (2010) The Federal Democratic Republic of Ethiopia: Growth and Transformation Plan (2010-2014/15), Draft Document: Addis Ababa
- [23] National Meteorological Agency (2007) “Climate Change National Adaptation Programme of Action (NAPA) of Ethiopia.” Addis Ababa, Ethiopia, Ministry of Water Resources. <http://unfccc.int/resource/docs/napa/eth01.pdf> <http://unfccc.int/resource/docs/napa/eth01.pdf> [Accessed J December 29, 2015].

- [24] National Meteorological Agency (2007) Climate Change National Adaptation Programme of Action (NAPA) of Ethiopia In: Tadege, A. (ed.). Addis Ababa, Ethiopia: National Meteorological Agency (NMA).
- [25] Oxfam, (2009). Band Aids and Beyond: Tackling disasters in Ethiopia 25 years after the famine. Oxfam Briefing Paper133, October 2009.
- [26] Seleshi, Y., &Camberlin, P. (2006). Recent changes in dry spell and extreme rainfall events in Ethiopia. *Theoretical and applied climatology*, 83(1-4), 181-191.
- [27] Stern, N. (2007). *The economics of climate change: The Stern review*. Cambridge, UK: Cambridge University Press
- [28] The International Disaster Database] (2011) The International Disaster Database. Online at: <http://emdat.be/>[Accessed April22, 2016].
- [29] UNECA (2011) Assessment of Africa's Climatic Records and Recording Networks Including Strategic for Rescuing of Climatic Data, working paper 3,available at: <http://www.uneca.org/acpc/publications>. [Accessed June20, 2016].
- [30] UNECA (2011) Assessment of Africa's Climatic Records and Recording Networks Including Strategic for Rescuing of Climatic Data, working paper 3, <http://www.uneca.org/acpc/publications>
- [31] UNECA (2011) Management of Ground Water in Africa Including Transboundary Aquifers: Implications for Food Security, Livelihood and Climate Change Adaptation, working paper 6, <http://www.uneca.org/acpc/publications>
- [32] UNEP (2007) Mangroves of Western and Central Africa. UNEP-Regional Seas Programme/UNEP-WCMC.
- [33] United Nations Framework Convention on Climate Change (UNFCCC), 2009. *Copenhagen Accord: Draft decision -/CP.15, Fifteenth Session of the Conference of the Parties, Copenhagen, and December 2009*. [pdf] Available at: <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>. [Accessed May12, 2016].
- [34] United Nations Framework Convention on Climate Change (UNFCCC), 2012. *Appendix I – Quantified Economy-wide Emissions Targets for 2020*. [online] Available at: http://unfccc.int/meetings/copenhagen_dec_2009/items/5264.php. [Accessed June20, 2016].
- [35] United Nations Framework Convention on Climate Change. (2011). Compilation of information on nationally appropriate mitigation actions to be implemented by Parties not included in Annex I to the Convention. Ad Hoc Working Group on Long-term Cooperative Action under the Convention. Available at: <http://unfccc.int/resource/docs/2011/awglca14/eng/inf01.pdf>. [Accessed June25, 2016].
- [36] United Nations Framework Convention on Climate Change. (2011). Draft decision -CP.16 Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention, accessed on 12 March 2011 on http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_lca.pdf[Accessed May11 , 2016].
- [37] Webb, P., von Braun, J., and Yohannes, Y. (1992) Famine in Ethiopia: Policy Implications of Coping Failure at National and Household Levels. International Food Policy Research Institute. Research Report No. 92. Washington, D.C.: IFPRI.
- [38] Woldeamlak, B. (2009) Rainwater Harvesting as a Livelihood Strategy in the Drought-Prone Areas of the Amhara Regions of Ethiopia. Addis Ababa: Organization for Social Science Research in Southern and Eastern and Southern Africa.
- [39] World Bank (2006) Ethiopia: Managing water resources to maximize sustainable growth. Washington, D.C.: World Bank.
- [40] World Bank (2009) Impact Assessment of the PSNP Public Works Program, Volume II, Main Report, M.A. Consulting Group, Nairobi in association with Prospect Development Consult, Addis Ababa.
- [41] World Bank (2009a) *Towards the Competitive Frontier: Strategies for Improving Ethiopia's Investment Climate*. Washington DC: World Bank.
- [42] World Bank (2010) Economics of Adaptation to Climate Change: Ethiopia. The World Bank, Washington, D.C.
- [43] World Bank (2011) Climate-Smart Agriculture: Increased Productivity and Food Security, Enhanced Resilience and Reduced Carbon Emissions for Sustainable Development, Opportunities and Challenges for a Converging Agenda: Country Examples. World Bank, Washington, D.C.
- [44] World Bank (2013). Building Resilience: Integrating climate and disaster risk into development. Lessons from World Bank Group experience. The World Bank, Washington DC.
- [45] World Bank. 2010b. —Vietnam Country Case Study, Economics of Climate Change Adaptationl, World Bank Group, Washington DC Accessed on: <http://climatechange.worldbank.org/content/country-case-studies-economics-adaptation-climate-change>. [Accessed April 19, 2016].