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# Exploring Climate Change Education:
# A Comparative Analysis of Ethiopian and English School Systems

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***Abstract***

This bachelor thesis analyzes the differing approaches to climate change education (CCE) in the United Kingdom and Ethiopia, examining how each country's educational system addresses the global challenge of climate change. By utilizing a comparative case study, this research analyzes secondary school curricula and policy documents to identify and compare the characteristics of CCE in both countries. The research is guided by two theoretical frameworks, the scientific perspective, focusing on vulnerability, adaptation, and mitigation, and the "good" climate change education framework, which includes cognitive, socio-emotional, action-oriented, and justice-focused dimensions. Findings reveal significant differences: the UK's CCE is heavily oriented towards mitigation and topics regarding action-oriented and socio-emotional dimensions. In contrast, Ethiopia's approach emphasizes vulnerability, mitigation, cognitive and action-oriented dimensions and integrates local environmental content, reflecting its higher climate vulnerability. However, both countries show a significant gap in justice-focused content in CCE. The study concludes that while both nations are committed to CCE, their educational strategies reflect their distinct vulnerabilities and responsibilities in the climate crisis. This analysis contributes to the broader dialogue on optimizing CCE to better prepare future generations for global and local climate challenges.

**Keywords:** Climate change education, comparative case study, curriculum analysis, policy analysis, Ethiopia, United Kingdom

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# 1. Introduction

"*The era of global warming has ended; the era of global boiling has arrived. Leaders must lead. No more hesitancy. No more excuses. No more waiting for others to move first. There is simply no more time for that. It is still possible to limit global temperature rise to 1.5 degrees Celsius and avoid the very worst of climate change. But only with dramatic, immediate climate action"* (Guterres, 2023). The excerpt of Antonio Guterres speech at a press conference regarding climate change describes the gravity of it and the emergency of climate action. Climate change is one of the greatest challenges of humankind, with it causing natural catastrophes like flooding, heat waves and wildfires. Furthermore, the people who are most at risk are feeling the effects of climate change the hardest and earliest. Climate change is making existing inequalities worse, so solutions that recognize and deal with problems especially vulnerable communities face are needed (Cambridge University Press & Assessment, 2022). One could ask now why we have failed to bent the CO2 emissions curve and let the climate crisis develop as far as it is now (Stoddard et al. 2021). An important part of the overall answer to that question is that we have been uninformed for too long.

Consequently, one key aspect in tackling climate change is education. Climate change education (CCE) helps understanding what causes the change and what the consequences are. This is the first step towards changing attitudes regarding the global climate crisis, finding new ways to lessen its effects, and getting ready for the transformations that cannot be avoided (Siemens Stiftung. (n.d.)). Additionally, CCE should lead to less anxiety, denial, and apathy regarding climate change. Recognizing the critical role of education in addressing the challenges of this crisis, global agreements such as the UN Framework Convention on Climate Change and the Paris Agreement, together with the Action for Climate Empowerment (ACE) agenda, emphasize the responsibility of governments to provide comprehensive CCE (UNESCO). Still, according to a study conducted by UNESCO of almost 50 countries, more than half of the countries do not mention climate change at all in their curricula (UNESCO).

According to Stoddard et al. (2021, 671) inaction regarding the climate crisis often stems from inequity, as countries that bear more responsibility for the climate crisis often avoid facing similar consequences as countries from the Global South which are already heavily impacted. It is well known that these differences exist and this paper will examine how they affect CCE. Therefore, it's an interesting prospect to assess how CCE varies between the Global North and

South. To explore this, the paper will make use of a comparative case study that analyzes CCE in both the UK and Ethiopia.

In recent years, there has been a growing interest in the role of education in addressing climate change (Monroe et. al. 2019; Cutter-Mackenzie & Rousell 2019; Lavonen 2022; Nepraš et. al. 2022). Some of the current literature focus on case studies like Chang and Pascua (2017) who published a case study, analyzing the school curricula regarding CCE in Singapore. One example for a comparative case study regarding climate education is from Lindemann-Matthies et al. (2009) who compared the integration of biodiversity in educational systems in Cyprus, England, Switzerland, and Germany.

But comparative case studies focusing on CCE of countries from the Global South and North are scarce and a study focusing on the UK and Ethiopia has, to the researcher's knowledge, not been done before. This comparison is vital as it highlights how different vulnerabilities and responsibilities towards climate change can potentially influence educational strategies. Understanding these specific circumstances leads to a development of CCE that is directly relevant to the students' environment, making the education more practical and applicable. By analyzing the differences between approaches of CCE in Ethiopia and the UK, the existing literature will be extended. Through integrating two theoretical frameworks, scientific and "good" CCE, a detailed understanding of what effective CCE could look like globally is offered by this thesis. Although the study focuses on just two countries, they can be representative of broader groups, as Ethiopia is part of the Global South, and the UK is part of the Global North. These regions typically have differences in resources and exposure to climate impacts and by analyzing these diverse contexts, the study could provide insights that are applicable to other countries with similar characteristics. Furthermore, it examines whether theory, such as "good" CCE, developed in one context is applicable or needs adaptation in another, which is crucial for making effective global policies and educational frameworks.

Answering these questions is not just relevant for scientific purposes. The societal relevance of it, is to understand how countries such as Ethiopia and the UK prepare upcoming generations with the realities and challenges of climate change. Since this research is taking into account various reasons for CCE to differ, this study can inform policymakers on how to shape comprehensive and inclusive CCE in national curricula. By revealing the strengths and gaps in the CCE approaches of the UK and Ethiopia, policymakers can identify shortcomings in their own nation's curricula. Furthermore, educators can gain insights into "good" CCE with

examples that have been successfully implemented. This could possibly lead to new teaching approaches and activities that are more relevant to students' real-world experiences with climate change.

This thesis will answer the following research question*:* ***how do approaches to climate change education in Ethiopian and English school systems differ in terms of the climate scientific and "good" climate change education theoretical streams?***

To answer this general question, this research seeks first answers the following sub-questions:

1. *What reasons do the scientific and the "good" climate change theoretical streams reveal for the countries to differ in climate change education?*

The first sub-question will be answered in the theory section by explaining how vulnerability, adaptation and mitigation could potentially influence climate change education in Ethiopia and the UK. Additionally, it will be explained why the countries could differ regarding the "good" climate change educational framework.

2. *What are the characteristics of climate change education in secondary school curriculum as well as policy documents of Ethiopia regarding the climate scientific and the "good" climate change education theoretical streams?*
3. *What are the characteristics of climate change education in secondary school curriculum as well as policy documents of the United Kingdom regarding the climate scientific and the "good" climate change education theoretical streams?*

The second and third sub-questions are going to be discussed in the analysis and answered in the discussion section. In the analysis for each country first the policy documents will be analyzed according to the two theoretical streams and afterwards the same will be done with the countries curricula.

The methodology employed in this paper will primarily consist of textual analysis, drawing upon a range of curriculum materials and policy documents from both countries. By analyzing the content, the used language regarding climate change, and underlying assumptions of these texts, insights into the priorities, narratives, and discourses surrounding climate CCE can be gained in each context.

# 2. Theoretical background

## 2.1. Two theoretical streams

Since its scientific recognition in the 1970s, climate change has prompted global actions like the 2015 Paris Agreement to limit warming to well below 2 degrees Celsius, making an effort to remain below 1.5 degrees, underscoring the ongoing need for effective CCE. This thesis will focus on CCE in Ethiopia and the UK since prior research shows that both countries have this kind of education implemented to the sufficient degree to be analyzed and compared and they face different challenges and responsibilities towards climate change. Further reasons for choosing these two countries are going to be explained further in the method section. For the comparison two theoretical streams are presented that analyze CCE of both countries.

The first theoretical stream focuses on climate science with particular emphasis on major differences between countries and the respective efforts to be taken along with the consequence of the unique position that each country finds itself in. This stream is important as the different degrees of vulnerability, adaptation, and mitigation influence the type of CCE that is needed. To have a complete analysis, the theoretical stream will address the three previously mentioned dimensions: vulnerability, adaptation, and mitigation.

However, these dimensions are too large and too general to grasp the details that are needed for good education in the area of climate change. What rather is needed is a more specific theoretical framework that can outline the nature of good CCE in a more specific way. This calls for the second theoretical stream, defining features of good CCE. This stream takes the more general features of the first stream and gives a more detailed and specific theory on CCE that can be used in the design and implementation of CCE programs. The thesis presents an integrative analysis that presents a view from general climate science to the narrower view of educational strategies.

## 2.2. Climate scientific theoretical stream

### 2.2.1. Vulnerability to climate change

The ND-GAIN index ranks 181 nations based on a composite score measuring each country's vulnerability to climate change and other global challenges, alongside its readiness to enhance resilience (ND-Gain 2021). Ethiopia is categorized as being vulnerable to climate change impacts, with being the 163rd spot out of 181 countries in the 2021 ND-GAIN Index. The lower a country's vulnerability, the higher it is positioned in the ranking and the readiness to foster

resilience also correlates with a higher ranking. The Vulnerability score of Ethiopia is 0,547 and the readiness score is 0,297. In comparison, the UK secures the 10th spot out of the 181 countries and has a vulnerability score of 0,283 and a readiness score of 0,658 (ND-GAIN 2021). Based on these differences, we can come up with a theoretical expectation about the possible differences between climate education in both countries.

> Climate science expectation 1: Due to Ethiopia's higher vulnerability score compared to the UK, there is a higher emphasis on vulnerability in climate change education in Ethiopian schools.

### 2.2.2. Adapting to climate change

Addressing the impacts of climate change requires proactive measures that foster sustainable risk management. By failing to implement adaptation strategies, this could lead to complications and suffering including society, environment, and economy. The UK is already facing some factors of climate change such as heavier rainfalls than before and heatwaves (Met Office2 n.d.). Consequently, the UK published their third National Adaption Program (NAP3) in 2023 which consists out of a five-year plan focusing on adaptation to climate change and making the country more resilient in infrastructure, natural environment, health, communities and business and industry (GOV.UK 2023). Ethiopia is challenged by frequent extreme events like droughts and floods, along with fluctuating rainfall patterns and rising temperatures (USAID 2016). The priority areas for adaption to climate change of Ethiopia are adapting agriculture, forestry, transportation, energy, industry, and urban development (Federal Democratic Republic of Ethiopia 2020. From these distinctions, we can hypothesize about the likely differences in climate education between the countries.

> Climate science expectation 2: Based on this information and the different realities of climate change both countries face, in Ethiopia adaptation is more necessary than in the UK, and therefore it will be more represented in Ethiopia's climate change education.

### 2.2.3. Mitigating climate change

Efforts to prevent severe climate change rely on limiting temperature rise to 1.5°C through widespread mitigation measures across various sectors. The UK is one of the top 20 countries contributing the most to global CO2 emissions. In comparison the UK emitted 340,61 CO2 emissions in 2022 and Ethiopia 21,11 CO2 emissions (World Population Review 2024). In the UK the key strategies in mitigating CO2 emissions are reducing greenhouse gas emissions by 57% compared to 1990 levels by 2030 and achieving carbon neutrality by 2050 (Arregui and

Parry 2020). In Ethiopia's Growth and Transformation Plan (GTP) II, which is the renewal of Growth and Transformation Plan (GTP) of 2011, ambitious objectives for the country such as including green growth planning strategies into its development and economic planning frameworks are being outlined (National Planning Commission 2016). The overall goal is a Climate-Resilient Green Economy. With these differences, it is possible to predict the potential contrasts in climate education in both countries.

> Climate science expectation 3: Since the mitigation challenge is bigger for the UK than for Ethiopia, mitigation is expected to be more present in English climate change education than in the Ethiopian.

## 2.3. Climate change education

Children and young adults are the ones that are going to be most affected by climate change in the future. Effective CCE serves as an important instrument in fostering public comprehension and response to the challenges made by climate change. Its primary goal is to lead to awareness and collective efforts towards mitigating and adapting to climate change (Global Education Monitoring Report Team 2022). For this paper, "good" CCE will be used as a framework to analyze CCE in Ethiopia and the UK. Given the first theoretical stream, rather broad categories were described and to make CCE more concrete, this thesis will focus on four categories that describe "good" CCE defined by SEPN, the sustainability and education policy network (SEPN 2021). This second theoretical stream is being used to achieve more fine-tuned expectations.

### 2.3.1. Cognitive

The first dimension is the cognitive one and it is about teaching students the causes of climate change and critical thinking skills (SEPN 2021, 3). It is essential for students to learn about climate change, especially what causes it, what the consequences of climate change are now and in the future and what solutions are there to deal with it. Furthermore, a lot of misinformation about climate change exists and false information can be spread easily with the use of internet (Hargis et al. 2021, 48). Some claims go even as far as denying the whole topic. Consequently, students must be prepared to distinguish critically between facts and "fake news" since these kinds of information can otherwise lead to a misunderstanding and confusion of the students (Hargis et al. 2021, 48). Since both countries claim to have CCE embedded in their education, it is to be expected that both Ethiopia and the UK have the cognitive dimension integrated in their educational programs. Based on this information, we can come up with a theoretical expectation about the possible similarities of climate education in both countries.

> "Good" Climate change education expectation 1: As the categorization of "good" CCE is still relatively new, it is not expected that Ethiopia and the UK fulfill all four dimensions. Still, with this information on climate change it is to be expected that the UK as well as Ethiopia have the cognitive dimension equally incorporated in their CCE since it forms the basis for further education and knowledge.

### 2.3.2. Socio-emotional

When climate change education is more present in the school curricula, students gain more knowledge about climate change, but they also understand the risks and consequences of it. This could lead to pupils feeling overwhelmed and helpless whereas time for change is running away and not enough is being done by governments around the world. They might develop eco-anxiety. This can be described as the concerns and distress about the climate crisis (Brophy et al. 2023). To prevent students from feeling this way, the second learning dimension, is the socio-emotional which should help students to overcome denial, anxiety and inaction towards climate change (SEPN 2021, 3). This aspect of CCE should empower students and make them feel like they in fact can make meaningful change (Hargis et al. 2021, 48). Furthermore, the socio-emotional component also incorporates cultural and political considerations. Here, the focus lies on interdisciplinary work and the use of language and the framing of climate change (Hargis et al. 2021, 49). From these distinctions, a theoretical expectation about the probable differences in climate education between the countries can be made.

> "Good" Climate change education expectation 2: The socio-emotional dimension is expected to be included in both countries, but more present in Ethiopian curricula or policy documents since there the consequences of climate change are more visible and therefore it is of a higher importance to not let students feel overwhelmed or helpless in their situations.

### 2.3.3. Action-oriented

Action is one way to help students to feel less overwhelmed and hopeless about the climate crisis. Therefore, the third category, is action-oriented and it describes that teachers should use participatory methods (SEPN 2021, 3). Effective CCE should offer students issues on the climate presented in a way that they can act. Schools should allow and even encourage students to be part of events such as the Global Climate Strikes without any penalization (Hargis et al. 2021, 49). They should use teaching strategies grounded on local issues. This is very important to integrate within the curriculum of the various disciplines so that students understand that the

tackling of climate change is a challenge which calls for both, social and political action, and not only scientific solutions (Hargis et al. 2021, 49). With these differences, it is possible to predict the potential contrasts in climate education in both countries.

> "Good" Climate change education expectation 3: In connection with the mitigation part of the climate science theoretical stream, the UK is to be expected to focus more on the action-oriented dimension in contrast to Ethiopia.

### 2.3.4. Justice-focused

The last dimension is justice-focused and should connect climate injustices to other injustices like race, gender and class (SEPN 2021, 3). Climate change is a climate justice issue in which people most affected by changes they did not provoke or rather contribute the least toward their occurrence. This issue can also be analyzed in a larger frame of social and ecological injustices, such as colonization, racism, sexism, ableism etc. (Hargis et al. 2021, 49). The domination and oppression of mostly the Global North of the Global South is a central issue and therefore it is very important to address the underlying and systematic problems in schools so that students learn about it. Considering these differences, an expectation can be proposed about the differing approaches to climate education between the two countries.

> "Good" Climate change education expectation 4: Ethiopia is expected to have the justice-focused category included in contrast to the UK since Ethiopia is the country emitting less but facing more severe consequences of climate change.

## 2.4. Concluding remarks

This section has presented a theoretical framework to examine what reasons exist for CCE to differ in Ethiopia and the UK. The reasons were divided into two theoretical streams to provide a more general and scientific dimension regarding climate change impacts on the countries, such as their vulnerability, their adaptation and mitigation strategies and how this can be connected to their priorities being set in their CCE frameworks. Hence, for every dimension of the scientific stream one expectation was formulated. For the "good" CCE theoretical stream in total, four expectations exist. The expectations will be answered in the discussion part after the data analysis has been completed. The next section explains the used methodology to answer the expectations and later on the sub-questions.

# 3. Methodology

This thesis aims to understand how CCE can differ in countries in the Global South and the Global North. As explained in the theoretical framework, Ethiopia and the UK are facing different realities regarding their vulnerability, their adaptation to climate consequences and their mitigation efforts. Consequently, this thesis will analyze if their differing realities have an impact on their CCE. Furthermore, through thorough analysis of curricula and policy documents this paper will carve out the extent to which “good” CCE is incorporated in their schools. By doing this, this chapter will explain further how the sub-questions and proposed hypotheses will be answered in the following parts. The thesis uses qualitative content analysis for comparing the two countries’ implementation of CCE. Content analysis is defined as "*the intellectual process of categorizing qualitative textual data into clusters of similar entities, or conceptual categories, to identify consistent patterns and relationships between variables or themes"* (Julien 2008, 120). Furthermore, content analyses are often conducted using research tools. In this case Atlas.ti will be used and to do so a coding scheme is developed to analyze the curricula and policy documents (Atlas.ti 2024). Firstly, the two educational systems will be presented to give a general overview and it will be explained why this paper focuses on secondary education. Hence, it will be justified why the two countries were chosen. Furthermore, data collection will describe which documents will be used, how they were accessed, and why they were chosen. In the end, it will be illustrated that content analysis is going to be used and how the coding scheme is developed to analyze the case and answer the research question.

## 3.1. Educational systems in both Ethiopia and the United Kingdom

In the following the educational systems of both Ethiopia and the UK will be explained to provide a general understanding of the school systems, through deep research regarding CCE in both Ethiopia and the UK the two countries were seen as suitable for this paper.

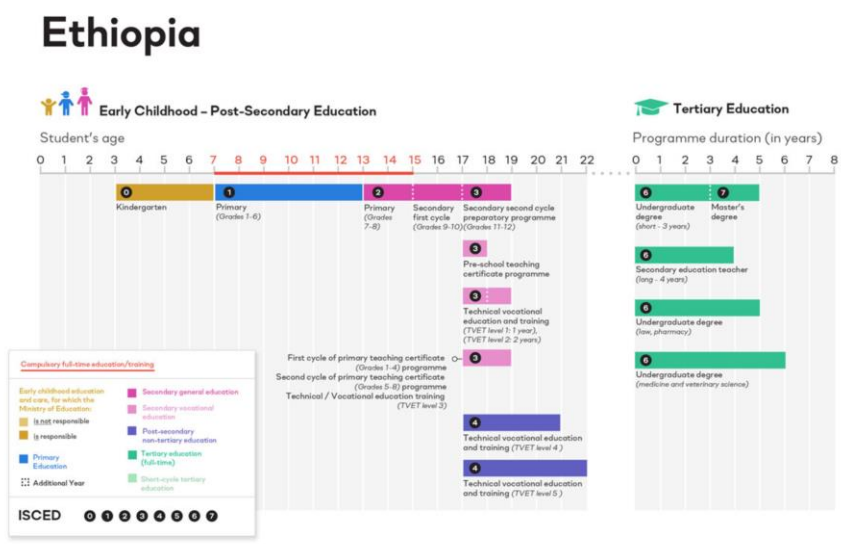


*Figure 1: Educational System of Ethiopia*

(UNESCO n.d., International Standard Classification of Education.)

As can be seen in the figure 1, primary education in Ethiopia takes eight years so until the students age of 15 years and after that secondary school follows on for four years. The student will normally be 19 years old when finishing secondary education. Although, the educational system stretches from grade 0 to grade 12, only education starting at age seven (grade 1) until age twelve (grade 6) is compulsory (Scholaro database n.d.). Currently, there are 32000 schools and public education is free for primary, secondary and tertiary schools (Britannica n.d.).

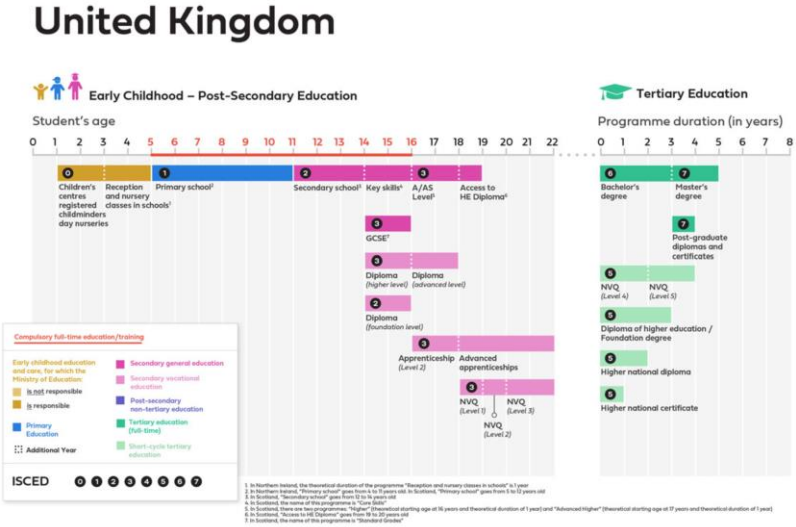


*Figure 2: Educational System of the United Kingdom*

(UNESCO n.d., International Standard Classification of Education.)

Figure 2 shows that in the UK, primary school lasts six years and secondary school eight years. As in Ethiopia the student is nineteen years old when finishing high school. Education in the UK is compulsory until the student turns sixteen years old (Study in UK n.d.). The UK has about 32000 schools (Besa 2020). In both Ethiopia and the UK, different school types exist like national, private, or international schools. This thesis will only focus on the national schools since it is the common school system regulated by the government and therefore more transparent regarding accessible curricula. Although the countries face different consequences of climate change and have a differing responsibility towards the climate crisis, both have an extensive school system and have a minimum of six years of secondary high school. The analysis will mainly focus on the secondary school curricula since students in both countries have reached a certain age where they are able to understand complex relationships of causes and consequences of climate change and what kind of solutions exist.

## 3.2. Case selection

This thesis will use a comparative case study focusing on the comparison of the UK and Ethiopia. In general, this kind of study is a research approach that systematically compares multiple cases to explore patterns and variations across different contexts, often to develop or test theoretical expectations (Hague, Harrop and McCornick 2019; Ragin 2014). This thesis will focus on analyzing two cases and the decision to analyze these countries stems from various reasons.

First, especially these two countries were chosen because this paper wants to raise attention concerning the inequity of Global South and Global North countries regarding the different responsibilities of causing of climate crisis and the action that is taken. By comparing these countries, the overall issues of existing inequalities about climate change and the importance of CCE will become clearer. The UK belongs to the Global North and Ethiopia to the Global South (World Population Review 2024). Countries belonging to the Global North typically have higher emissions than countries being associated with the Global South (Hickel 2020). According to a research paper published in September 2020 in The Lancet Planetary Health, the Global North is responsible for 92% of global carbon emissions (Hickel 2020). Further, Hickel argues that countries belonging to the Global North have a higher responsibility for

climate damage than other countries. Although, countries from the Global North are more responsible they contribute less to working on a more sustainable future.

Second, both countries have committed to addressing climate change by signing for example the Paris Agreement in 2015, including climate change education. This indicates that the two countries have a responsibility to teach students about climate change and promote practices.

Third, coming back to climate change education, a UNESCO study shows that countries with high emissions are generally lacking in incorporating climate change content in their school curricula. This dichotomy offers insights into how a high emitting country (the UK) and a very low emitting country (Ethiopia) are currently affected by climate change and how this represents or strengthens existing inequalities. Based on literature like the UNESCO report, Hickel's paper and Hadré's analysis this thesis expects that the UK in comparison to Ethiopia is lacking in incorporating CCE to a sufficient degree.

Fourth, it is interesting to research if these power dynamics will be mentioned in either of the countries CCE. Furthermore, the countries were selected because of their different levels of vulnerability towards the climate crisis whereas Ethiopia is one of the most vulnerable countries and the UK one of the least affected countries by climate change.

Fifth, when looking at the school systems of Ethiopia and the UK, they are comparable since both countries have a formal structure that includes primary, secondary and tertiary levels of education. Furthermore, both countries have compulsory education for children and Ethiopia as well as the UK employ a national curriculum at the primary and secondary level. Further, in both Ethiopia and the UK, the educational system is overseen by the government. In Ethiopia the educational system is overseen by Ethiopia's Ministry of Education and in the UK by the UK's Department for Education.

Sixth, while researching on CCE, it became apparent that both countries have implemented CCE to a sufficient extent for the analysis and that the necessary documents can be accessed. Apart from that, Ethiopia and the UK were chosen because there is no language barrier in analyzing the documents expected as the documents of the UK are automatically written in English and the necessary Ethiopian documents were translated to English as well. By comparing these two countries, the overall issues of existing inequalities regarding to climate change and the importance of CCE will become clearer.

## 3.3. Method of data collection

The aim of the data collection is to obtain official curriculum documents of secondary school and policy documents related to CCE from both Ethiopian and English school systems. For the data collection process, relevant curriculum materials and policy documents will be accessed through online databases, government websites, educational portals, and academic journals. These sources offer a variety of information regarding educational policies and curriculum frameworks. Both curricula and policy documents will be used to get a more informed and specific analysis than just using one of these sources. By making use of both sources, this research goes from a more general official stance and educational directives of a country (policy documents) to the practical implementations of educational policies which outline what content is exactly taught in schools (curricula).

The first step in the data collection process will be the analyzation of official curriculum documents for secondary schools in Ethiopia and the UK. These documents outline the content, objectives, and structure of CCE within the respective national curricula. Furthermore, national education policies and guidelines related to CCE will be gathered to understand the overarching goals and priorities set by the governments of Ethiopia and the UK. Throughout the data collection process, careful attention will be paid to ensure the reliability and validity of the collected materials (Krippendorff 2004). By gathering and analyzing these materials, the research aims to identify differences and similarities in approaches to CCE and to address the expectations, sub-questions and research question outlined in the study.

## 3.4. Method of data analysis

The method consists of content analysis. This way multiple stages, including skimming, thorough reading, and interpretation of documents are encompassed (Bowen 2009, 32). Furthermore, this kind of analysis entails organizing information into relevant categories aligned with the research question (Bowen 2009, 32). The process involves re-examination of the data, enabling the reviewer to extract meaningful themes through coding and category formation tailored to the data's characteristics (Bowen 2009, 32). Content analysis in combination with the comparison of Ethiopia and the UK will provide sufficient information to answer the hypotheses. Moreover, to make use of the key theoretical concepts, abstract theoretical terms such as "vulnerability to climate change," "mitigation and adaptation strategies," and "good" CCE are being broken down into observable codes. The analytical scheme is incorporating both pre-defined (deductive) and emergent (inductive) codes.

Deductive codes are developed based on existing literature and theoretical frameworks, ensuring the analysis is grounded in established research. Inductive codes, on the other hand, remain open to new themes and insights that arise directly from the data.

The collected documents will be imported into the software, Atlas.ti, for systematic coding analysis (Atlas.ti 2024). As a qualitative data analysis software, Atlas.ti systematically organizes collected documents with the relevant codes (Atlas.ti 2024). The design of the program makes it possible to analyze large volumes of text, identify patterns, and extract key themes. Moreover, Atlas.ti's visual representation tools help mapping out the relationships between different codes and categories, providing a clear overview of how various concepts interlink and influence each other within the data set (Atlas.ti 2024). For a thorough analysis a coding scheme and specific codes based on key theoretical concepts and research sub-questions, including themes related to vulnerability, perspectives on mitigation and adaptation and "good" CCE will be utilized.

## 3.5. Coding scheme

Climate scientific theoretical stream

| Category | Codes |
|---|---|
| Vulnerability to climate change | Biodiversity<br>Vulnerability<br>Hazards<br>Environment<br>Consequences of climate change (CC) |
| Adaptation | Resilience<br>Disaster risk reduction<br>Community-based adaptation |
| Mitigation | Energy efficiency<br>Sustainability<br>Mitigation |

"Good" climate change education theoretical stream

| Category | Codes |
|---|---|
| Cognitive | Causes of climate change<br>Pollution<br>Critical thinking<br>Environmental protection<br>Climate change |
| Socio-emotional | Emotional resilience |

| | |
|---|---|
| | Coping strategies<br>Empowerment<br>Motivation for action |
| Action-oriented | Environmental activism<br>Youth engagement<br>Student-led initiatives<br>Project-based learning<br>Sustainable lifestyle |
| Justice-focused | Climate justice<br>Gender equality<br>Indigenous knowledge<br>Equity<br>Advocacy for marginalized communities |

## 3.6 Concluding remarks

The chapter aims at showing how the sub-questions will be answered. The method chapter describes why Ethiopia, and the UK were chosen for the comparative case-study, and how the necessary documents will be analyzed through content analysis. The coding scheme is divided into two main sections according to the two theoretical streams described in the theory part. The scientific theoretical stream is then divided into three categories, namely vulnerability, adaptation and mitigation. Each category has various codes, which are going to be used for the qualitative analysis using Atlas.ti as the tool. "Good" CCE is divided into the cognitive, socio-emotional, action-oriented and justice-focused categories. A more detailed coding scheme with one specific example for each dimension is provided in the appendix. This extra coding scheme was used to get an overview over the two countries before starting the analysis. The division of the coding scheme is adherent to the theory section so that the expectations and the sub-questions can be answered in a coherent and structured way.

# 4. Data analysis

## 4.1. Introduction

In the following chapter, the results of the textual analysis will be presented to demonstrate which characteristics of climate change education appear in the curricula and policy documents of Ethiopia and the UK. The enquiry will be separated by the sub-questions and to make the distinction between the curricula and the policy documents clearer, each of them will be analyzed in its own sub-chapter for each country. With the help of this distinction it can be illustrated if there are any differences between the national curricula and the policy documents. One important factor to recognize here is that both curricula but especially the national curriculum from the UK are significantly older than the policy documents. To answer the research question, the curricula and policy documents of both countries will be analyzed, using this coding scheme in Atlas.ti to determine what the characteristics of Ethiopian and English CCE are (sub-question two and three). In the analysis part the focus lies on demonstrating how the seven theoretical categories are represented in the documents and the codes were mostly used for the coding process. Once the analysis is complete, a comparison of CCE between the two countries can be made, addressing the expectations outlined in the theoretical framework. By examining each nation separately and then contrasting their key characteristics of climate change, an in-depth understanding of the main findings will be provided. This approach helps answer the main research question by summarizing insights from the sub-questions. The goal of the analysis is to show that, in accordance with the two theoretical streams, CCE significantly differs in the two countries.

## 4.2. Characteristics of climate change education in Ethiopia

### 4.2.1. Climate change education in policy documents of Ethiopia

This section presents the findings from the analysis of CCE characteristics in Ethiopian policy documents, aligned with the two theoretical frameworks. The documents used for the analysis are: The Climate Change Education Strategy of Ethiopia 2017-2030, the Education Sector Development Programme VI and An Annotated Guideline for Curriculum Developers. Rather than analyzing each of the documents individually, this paper will present the collective insights from all three policy documents related to CCE. This approach will clarify the overarching focus of CCE in Ethiopia. Furthermore, it will follow the same structure as the analysis of the curricula.

*First theoretical stream: Vulnerability, Adaptation and Mitigation dimensions*

**Vulnerability** as the first dimension of the scientific theoretical stream is broadly represented especially in the annotated Guideline for Curriculum Developers. The focus here lies on teaching students how climate change can influence their environment in a negative way. Students are asked to *"(...) produce a group report on major environmental issues affecting Ethiopia (the groups could be reporting on soil erosion and land degradation (...) on deforestation and forest degradation, on water scarcity, biodiversity loss and on various types of pollution issue*" (Environment, Forest and Climate Change Commission 2019, 36). Besides, students do not only learn about potential forms of vulnerability just for Ethiopia but also worldwide by discussing global issues such as global warming, biodiversity loss and poverty resulting from climate change. In relation to consequences of climate change they should discuss various forms of hazards that could occur (Environment, Forest and Climate Change Commission 2019). Consequently, the concept of vulnerability is thoroughly addressed within the Ethiopian policy documents. In the same documents, adaptation is described as a way of ensuring education in a case of emergency.

All three documents discuss that it is necessary to *"(d)evelop a preparedness strategy and plan to ensure continuity of education in emergencies*" (Adis Ababa 2021, 94) and to *"(p)rovide schools in emergency-prone areas with training and equipment to enable students to continue their education, including WASH services*" (Ababa 2021, 94). These examples show that the focus here does not lie on teaching about **adaptation** measures in the classroom but rather actively including them into the school's policy. Therefore, despite the mention of adaptation measures in the policy documents, their absence from actual discussions in the classroom means that their adaptation is not effectively integrated into CCE in Ethiopia.

Within the **mitigation** dimension, CCE according to the policy documents clearly focuses on sustainability and how it can be achieved. Students should for example learn about afforestation, soil and water conservation, renewable energy and a green economic development. Furthermore, sustainability as a concept itself is going to be explained to students and discussed amongst them. Teachers should help "*(...) students understand that climate change mitigation generally involves reductions in human emissions of GHGs and mitigation may also be achieved by increasing the capacity of carbon sinks like through reforestation"* (Environment, Forest and Climate Change Commission 2019, 36). Consequently, mitigation is implemented into the policy documents CCCE to a sufficient degree.

*Second theoretical stream: Cognitive, Socio-emotional, Action-oriented and Justice-focused dimensions*

Environmental protection is an integral part of the **cognitive** category and in the policy documents it becomes apparent that topics such as the food chain and recycling, water conservation, proper land use should be incorporated in CCE. The learning strategy here is to "(*u)se examples and drawings to show how food chain exists symbolizing the path of energy within an ecosystem (...) and to also explain how plastic impacts the food chain and how recycling can reduce that impact* (Environment, Forest and Climate Change Commission 2019, 34). Moreover, students should learn to think critically about what scientific facts are or what might be false information and they should aim at finding solutions for causes of climate change to protect the environment. Therefore, the goals are for example to *"(a)llow students to understand the impact of industrial waste on the climate and let them express their thought on solving the issue"* (Environment, Forest and Climate Change Commission 2019, 37) and to "(*d)escribe how urbanization affects the climate"* (Environment, Forest and Climate Change Commission 2019, 37).

The **socio-emotional** category is being included by motivating students to take action against the climate crisis. They are given hope that there is still time to do something about this problem and to change for the better by focusing on doable solutions. Hence, students are supposed to reflect, discuss and share their thoughts about climate change and its consequences but also its solutions (Environment, Forest and Climate Change Commission 2019). By discussing and learning more about finding solutions, the students are given a positive outlook instead of leaving them to feel hopeless.

According to the climate change education strategy of Ethiopia, the "*CCE strategy goes beyond curricular review, it will meaningfully contribute to the success of the CRGE (Climate resilience and Green Economy) strategy implementation through strengthening co-curricular activities in schools" (UNCC n.d., 10*). This means that students in Ethiopia will not only learn theoretically about climate change and a green economy, but they will also get a chance to actively take part. Additionally, a goal of the Ethiopian CCE strategy is to achieve "*co/extra-curricular activities and further the integration of CCE among formal, non-formal and informal education" (UNCC n.d., 16).* By implementing co/extra-curricular activities students are the ones leading initiatives and they are engaged in an active process. In addition, students should be a "*Voice for the environment to save the climate"* (Environment, Forest and Climate

Change Commission 2019, 37). This describes that students themselves should think about how they can use the environment responsibly, protect it at the same time and change their behaviour if necessary. Therefore, the **action-oriented** dimension is very much included in Ethiopia's educational policy documents.

Regarding the **justice-focused** dimension, especially gender equality is mentioned multiple times but more in a general way and not directly linked to CCE. The education sector development plan of Ethiopia mentions that "*(e)mphasis is also placed on improving the access and completion of female students in secondary education"* (Adis Ababa 2021, 93) and to *"improve girls' access to quality education, participation, achievement and completion"* (Adis Ababa 2021, 93). But here again, it is about improving the situation of female students and it is not explicitly said that it is part of the CCE teaching. Furthermore, gender equality is not mentioned in the annotated guide for curriculum developers. Hence, although the topic is being addressed in the policy documents it is not sufficient to say that it is being integrated into CCE, especially because there is also no mention of climate justice or indigenous knowledge. Thus, during the analysis it became apparent that CCE in Ethiopian policy documents is being discussed and that there is a huge emphasis on vulnerability and mitigation as well as the cognitive, socio-emotional and action-oriented dimension. Adaptation and the justice-focused dimension are missing in the plan and recommendations for CCE.

### 4.2.2. Climate change education in Ethiopia curriculum

In this section features of CCE within the Ethiopian curriculum will be discussed incorporating the two theoretical streams. For Ethiopia two curricula for secondary education could be found. The first one is from the year 2009 and during the analysis it became clear that in this curriculum CCE is not mentioned. Therefore, only the national curriculum from 2020 will be taken into account. It includes climate change and environment in all subjects from the Grades 1-12 as a cross-cutting issue.

*First theoretical stream: Vulnerability, Adaptation and Mitigation dimensions*

Following the theoretical framework, the general education curriculum framework does not specifically include education about **vulnerability** concerning climate change. It mentions that "(d)ocuments developed on the following National Pressing and Cross Cutting Issues: - (…); - Environment and Climate Change (…)" (Ababa 2020, 59) but they do not go into further detail of the specific course contents and how populations or ecosystems could be vulnerable to climate change. Further, the curriculum lacks a direct mentioning or description on **adaptation**

measures specifically designed to prepare students and communities for the changing climate. With looking at **mitigation** strategies or lessons about Sustainability, Afforestation and reforestation only energy efficiency is mentioned as a way for students to better understand their environment.

*Second theoretical stream: Cognitive, Socio-emotional, Action-oriented and Justice-focused dimensions*

The second theoretical stream, which consists of four dimensions of "good" CCE is generally more represented in the curriculum. It provides six values which should function as the ground for students to learn about these values and incorporate them into their lives. One of them entails to teach about environmental protection and this is a core indicator that the **cognitive** dimension of "good" CCE has been implemented in their curriculum (Ababa 2020). However, it is not further described which topics will be included exactly when talking about environmental protection. Additionally, certain competencies are described which students should have acquired after finishing their high school and one of them is critical thinking. The curriculum states that, "(*a)n important outcome of a well-developed curriculum is producing learners who think critically and use this to deal with problems. When learners are empowered with critical thinking skills, they avoid being subjective, and use logic and evidence to arrive at conclusions*" (Ababa 2020, 26). Here, critical thinking is not directly mentioned in the context of CCE but since it is a core competency, and it should be included in every subject it is to be expected that it will also be covered in CCE.

Moving on to the next dimension of "good" CCE, the **socio-emotional** categorization, is not really represented in the curriculum. While environmental education may indirectly support students in understanding the social implications of climate change, explicit content aimed at managing climate-related anxiety is not apparent (Ababa 2020).

This leaves us with the **action-oriented** dimension and here the curriculum entails that project-based learning, and extra-curricular activities are being implemented (Ababa 2020). The project-based learning is mentioned multiple times throughout the curriculum, but environmental activism or youth-led initiatives are not directly mentioned.

The **justice-focused** categorization as the last dimension of "good" CCE is implemented to some extent by including indigenous knowledge, skills and values in the educational framework and by discussing equity in terms that there should be no discrimination because of differences in religion, gender, beliefs etc. (Ababa 2020). Both of the examples are meant to be

included in Ethiopian education in general, but it is not explicitly mentioned that this will happen especially within the scope of CCE. During the analysis it became clear that CCE is definitely part of the curriculum, mainly as a cross-cutting issue which is being integrated in the curriculum and teacher materials, without explicitly explaining how and which topics exactly are going to be inserted. Still, a lot of categories which are important for "good" CCE are being discussed throughout the whole curriculum as core values, competencies and principles of their education and therefore it is being expected that they will also be followed when talking about climate change.

## 4.3. Characteristics of climate change education in the United Kingdom

### 4.3.1. Climate change education in policy documents of the United Kingdom

This section outlines the results of analyzing the characteristics of CCE within UK policy documents, framed by two theoretical perspectives. Since the length of UK policy documents is shorter than the Ethiopian documents, in total more papers were analyzed to get a comparable insight into CCE in the UK as it has been done with Ethiopia. The following documents were used for conducting the analysis: The British Council Corporate Plan 2023-2025, the Climate Education Summit Action Plan, NDC ICTU 2022, The Sustainability and Climate Change Strategy- (strategy for the education and children's services systems) and the Sustainability and climate change strategy (our progress so far). For this analysis the most important document was the Sustainability and Climate Change Strategy- (strategy for the education and children's services systems). As with the analysis of the Ethiopian policy documents, this analysis will also not present every document on its own, but it will rather summarize the findings of all documents together.

*First theoretical stream: Vulnerability, Adaptation and Mitigation dimensions*

**Vulnerability** is thematized in the context of potential impacts of climate change and the importance of biodiversity (Department for Education 2023). But it is not further explained what consequences of climate change exactly should be included in the CCE of the UK.

The sustainability and climate change strategy discusses that students should "participate in the implementation of climate adaptation measures" (Department for Education 2023). Here, **adaptation** is being mentioned and it should be included in CCE but again it is not further explained what exactly should be talked about in the classroom. Another aspect of the

adaptation dimension is climate resilience. It is being mentioned in relation to their idea of a National Education Nature Park. With that, they hope *"(...) to contribute to the implementation of the nature recovery network, play (their) part in halting nature's decline (and) drive greater climate resilience"* (Department for Education 2023). Furthermore, it states the goal isth to achieve and teach about climate resilience in regard to flooding, air quality and overheating. Hence, according to UK policy papers CCE should include teaching students about adaptation measures.

Regarding contents of **mitigation** the focus in the policy documents of the UK lies in teaching about sustainability in general and especially about energy efficiency (British Council n.d.). In fact, the UK has the vision to be the*" (...) world-leading education sector in sustainability and climate change by 2030"* (Department for Education 2023). One aspect of achieving this goal is to reduce *"(...) direct and indirect emissions from education and care buildings, driving innovation to meet legislative targets and providing opportunities for children and young people to engage practically in the transition to net zero*" (Department for Education 2023). To achieve this the UK wants to collaborate with existing organisations which are already working on sustainable practices and knowledge production. This will help in achieving more efficient outcomes in CCE. For now, the importance of sustainability is taught in geography and sciences classes but by 2025, the UK wants to implement a new course, called Natural History to give more attention to the pressing issue of climate change. Hence, the policy documents adequately incorporate mitigation topics in CCE.

*Second theoretical stream: Cognitive, Socio-emotional, Action-oriented and Justice-focused dimensions*

Regarding "good" CCE, the UK wants to provide students with a better **cognitive** understanding of climate change. Students are supposed to understand the scientific facts behind energy efficiency in combination with learning about environmental protection such as energy and water use. Furthermore, *"(...) children and young people will learn about energy efficiency, the circular economy, climate resilience and green careers as part of educational building, maintenance and procurement projects, such as: low-carbon boiler replacements, smart meter installation, energy monitoring pilots and sustainable drainage systems"* (Department for Education 2023). Consequently, it became apparent during the analysis that students will learn about causes of climate change and solutions but educational approaches such as critical media literacy were not mentioned. To learn about climate change only is half

of what is important since there is a lot of false information, and students should acquire critical thinking skills to distinct between false information and scientific facts.

The second category of "good" CCE, the **socio-emotional** dimension, is addressed by making sure that *"(...) children and young people not only understand the scientific facts of climate change and have the skills needed for the future, but also that they have hope and determination to tackle the challenges it brings"* (Department for Education 2023). By giving students hope that there are solutions to climate change they should be motivated to actively be a part of the solutions instead of being passive and overwhelmed with all the new information. The University of Reading also states something similar in the context of CCE in schools by saying that they want to *"(...) ensure (that) all young people today and generations to come are equipped with the knowledge and understanding, and are empowered, to respond to and tackle the climate and ecological crisis facing our planet*" (University of Reading n.d.). This kind of empowerment is key for students to be informed and encouraged to learn more about climate change and what they can do deal with it. By doing this teacher do not leave their students alone with the issues of this world but they support them in learning about it. Moreover, the UK "(...) *will seek to inspire young people to choose career paths that support the transition to net zero, restoration of biodiversity and a sustainable future.* (Department for Education 2023). By stating this, CCE does not stop after students are finished with their high school, but they have the possibility to take their knowledge further and choose a career in this area. Accordingly, the dimension of socio-emotional CCE is very fulfilled.

Next, the policy documents were analyzed to see whether they included aspects of the **action-oriented** dimension. In the Sustainability and Climate Strategy it is stated that *"(p)ractical opportunities to participate in activities to increase climate resilience, reduce carbon impact and enhance biodiversity will enable children and young people to translate knowledge into positive action to improve their local communities, their country and the planet"* (Department for Education 2023) and consequently children are offered practical activities and clubs such as taking *"(...) part in eco-clubs or vegetable growing*" (Department for Education 2023) and they are *"(...) exposed to sustainable food choices, recycling, adaptation projects or weather and energy monitoring*" (Department for Education 2023). By offering school projects and clubs about climate change, students are not only motivated to take action, but they can in fact already do it in their schools. Thus, the action-oriented dimension of "good" CCE is taken into account.

While analysing the policy documents in regard to the **justice-focused** dimension it became apparent that it is only mentioned that a gender balance is wanted to be achieved especially in physics and computing (Gov UK 2022), but topics about gender equality, climate justice or equity are not included in climate CCE.

### 4.3.2. Climate change education in curriculum of the United Kingdom

This part will address aspects of CCE in the curriculum of the UK by following the two theoretical streams which include the cognitive, socio-emotional, action-oriented, and justice-focused dimensions, as well as the categorizations of vulnerability, adaptation, and mitigation. For the analysis of the national curriculum of the UK only one curriculum for secondary school could be found which is from the year 2014. It curriculum includes parts of CCE in the subjects' areas of science and geography.

*First theoretical stream: Vulnerability, Adaptation and Mitigation dimensions*

In the science area in key stage 4, potential consequences of climate change are being included in the teaching and it focuses on what effects could occur because of the increasing levels of carbon dioxide and methane (Department for Education 2014, 77). In biology, the importance of biodiversity is being discussed (Department for Education 2014, 73). Both examples can be attributed to the dimension of **vulnerability** since certain consequences of climate change can negatively impact a country and its residents. Additionally, the loss of biodiversity can also make a region more vulnerable towards climate change impacts which then in turn make the area in general more vulnerable. The curriculum does not explicitly cover **adaptation** strategies specifically designed to address the impacts of climate change. While there are general topics related to climate change, specific adaptation measures are not detailed.

**Mitigation** is being integrated in the science area since it is directly mentioned in the curriculum as *"(...) mitigation of, increased levels of carbon dioxide and methane on the Earth's climate"* (Department for Education 2014, 77). Furthermore, energy efficiency as a part of mitigation strategies is being taught and "*renewable and non-renewable energy sources used on Earth (and) changes in how these are used*" (Department for Education 2014, 78). are being discussed in the classroom. Additionally, the curriculum comprises that water resources should be kept potable and that there is a need for sustainable use of the Earth's water resources (Department for Education 2014, 77).

*Second theoretical stream: Cognitive, Socio-emotional, Action-oriented and Justice-focused dimensions*

In relation to the second theoretical stream the curriculum of the UK only focuses on the **cognitive** dimension of "good" CCE. In the science part of key stage 3, pupils are supposed to learn about pollution by discussing the *"production of carbon dioxide by human activity and the impact on climate"* (Department for Education 2014, 77). Moreover, in the geography section of the curriculum in both key stages 3 and 4, the students will learn about climate change in general and about the causes of it. This includes students to explore "*physical geography relating to geological timescales and plate tectonics; rocks, weathering and soils; weather and climate, including the change in climate from the Ice Age to the present; and glaciation, hydrology and coasts*" (Department for Education 2014, 92). While these elements are present, the depth and critical engagement with these topics could be enhanced to foster a deeper understanding and critical thinking among students. The human influence on the climate is being discussed, by showing the students *"(...) how human and physical processes interact to influence and change landscapes, environments and the climate; and how human activity relies on the effective functioning of natural systems"* (Department for Education 2014, 92). Hence, the curriculum includes some elements of the cognitive dimension, such as environmental science education, but does not specifically address environmental protection, solutions, or critical thinking strategies in detail. Consequently, the curriculum for secondary education focuses on mitigation information and strategies and on the cognitive dimension of "good" CCE. The remaining three dimensions of "good" CCE, the **socio-emotional, action-oriented** and **justice focused**, are not included at all. Here a significant gap in the CCE of the UK can be seen.

# 5. Discussion

After analyzing the curricula and policy documents from Ethiopia and the UK, in this section the expectations formulated in the theory section will be discussed. The first climate science expectation states that due to Ethiopia's higher **vulnerability** score compared to the UK, there is a higher emphasis on vulnerability in CCE in Ethiopian schools. Based on the CCE analysis of Ethiopia and the UK, it appears that the theoretical expectation is true. Ethiopia, having a higher vulnerability to climate change, places a greater emphasis on vulnerability in its educational approach. The curriculum and policy documents in Ethiopia extensively cover how environmental issues like soil erosion, deforestation, and water scarcity directly impact the nation, reflecting its high vulnerability. In contrast, while the UK acknowledges vulnerability, the focus is less detailed, aligning with its comparatively lower vulnerability score. Thus, Ethiopia's greater vulnerability is reflected in a more visible focus on these issues within its CCE, confirming the theoretical expectation.

The second climate science expectation entails that **adaptation** will be more represented in Ethiopia's CCE than in the UK. Despite Ethiopia's high vulnerability to climate impacts, which suggests a greater need for adaptation, its CCE focuses more on vulnerability and mitigation, with less emphasis on teaching about adaptation strategies. Ethiopian policy documents discuss broad structural adaptation measures like emergency preparedness and school policies but lack detailed content on adaptation in CCE. On the other hand, the UK, which faces a comparatively lesser immediate need for adaptation, integrates adaptation more clearly into its CCE. Consequently, contrary to the expectation that adaptation would be more emphasized in Ethiopia, the UK shows a clearer commitment to embedding adaptation strategies within its educational framework. This suggests a potential gap in Ethiopia's educational approach regarding the direct teaching of adaptation techniques.

The third climate science expectation states that the **mitigation** challenge is bigger for the UK than for Ethiopia and consequently mitigation is expected to be more present in English CCE than in the Ethiopian. Both Ethiopia and the UK emphasize mitigation in their CCE, though the theoretical expectation suggests it would be more pronounced in the UK. In Ethiopia, mitigation is integrated through discussions on sustainability practices like afforestation and renewable energy, evident in curriculum and policy documents. The UK also places a significant focus on mitigation, aligning with its ambitious national targets to reduce emissions.

The UK's education highlights energy efficiency and aims to engage students in achieving net-zero emissions, reflecting a strategic approach tied to comprehensive national environmental goals. Hence, while mitigation is a key component in both countries' climate education, the UK's focus is indeed more detailed, supporting the expectation of a greater emphasis on it compared to the Ethiopian.

According to the first "good" CCE expectation, it is to be expected that the UK as well as Ethiopia take the **cognitive** dimension in account in their CCE since it forms the basis for further education and knowledge. Both Ethiopia and the UK have indeed incorporated the cognitive dimension into their CCE, aligning with the expectation. In Ethiopia, CCE strongly emphasizes understanding the environmental issues and scientific facts about climate impacts. Similarly, the UK's CCE includes a substantial cognitive component by covering the causes, effects, and necessary responses to it, in their education. But as mentioned before the critical thinking aspect is missing in the UK's CCE. Still, both countries meet the expectation of incorporating the cognitive dimension into their climate education, ensuring that students receive the foundational knowledge required to understand and address climate change comprehensively.

The second "good" CCE expectation entails that the **socio-emotional** dimension is expected to be included in both countries, but more present in Ethiopian curriculum or policy documents since there the consequences of climate change are more visible and therefore it is of a higher importance to not let students feel overwhelmed or helpless in their situations. Contrary to the expectation the socio-emotional dimension is in fact more explicitly addressed in the UK's curriculum and policy documents. In Ethiopia, the focus on vulnerability and mitigation is strong, but there is less emphasis on explicitly managing climate-related emotional impacts. Discussions tend to focus on environmental challenges and solutions, indirectly supporting resilience but not directly addressing emotional coping strategies. Meanwhile, the UK has made significant efforts to incorporate the socio-emotional dimension, explicitly aiming to empower students by giving hope and motivation to tackle climate challenges. Therefore, the UK includes the socio-emotional dimension more clearly in its CCE, contrary to the initial expectation for Ethiopia.

According to the third "good" CCE expectation, the UK is to be expected to focus more on the **action-oriented** dimension than Ethiopia. Both Ethiopia and the UK significantly emphasize the action-oriented dimension in their CCE, which challenges the expectation that the UK

would focus more on this aspect than Ethiopia. Ethiopia's approach includes extensive co-curricular and extra-curricular activities that involve students in environmental projects. Similarly, the UK incorporates practical activities like eco-clubs, vegetable growing, and recycling projects within its educational framework. Therefore, the gathered information does not support the expectation that the UK would emphasize the action-oriented dimension more than Ethiopia. Both countries demonstrate a robust commitment to integrate practical learning into their CCE.

The last “good” CCE expectation implies that Ethiopia is expected to include the **justice-focused** category more than the UK since Ethiopia is the country emitting less but facing more severe consequences of climate change. The assumption is not strongly supported by the educational content reviewed. While Ethiopia’s education covers discussions over gender equality and the inclusion of indigenous knowledge for the general school system, explicit discussions on climate justice, equity, and the rights of marginalized groups in the context of CCE are not evident. Though the UK includes some mentioning of gender equality in its school system, it also does not significantly focus on the justice-focused dimension, since it is not included in their CCE. During the analysis, it became apparent that the two codes, climate justice and advocacy for marginalized communities which belong to the justice-focused dimension were not used at all. Thus, neither Ethiopia nor the UK emphasizes the justice-focused category in their CCE, contrary to the expectation based on Ethiopia's higher vulnerability and lower emissions.

In summary, not all the expectations were confirmed and therefore this analysis produced mixed results. Expectations one, three and four are confirmed and the expectations two, five, six and seven have been refuted. For the expectations two and five, the UK has shown greater efforts in implementing topics around adaptation and socio-emotional learnings than Ethiopia. For the sixth expectation both countries show an equal amount of commitment towards action-oriented CCE, instead of the UK emphasizing it more than Ethiopia. For expectation seven, neither country includes the justice-focused dimension in their CCE.

# 6. Conclusion

## 6.1. Answer to research question

In this section sub-questions two and three will be answered and afterwards the answer to the main research question will be given as well. To answer sub question two, the results of the analysis of Ethiopian curricula and the policy documents are being taken into account. In both sources' **mitigation**, the **cognitive,** the **socio-emotional** and **action-oriented** dimensions are being mentioned and discussed. Especially, the **cognitive** dimension is being addressed more in detail in both the curricula and in the policy documents. In the curriculum **socio-emotional** and **justice-focused** topics were addressed more vaguely and, in the policy documents, the justice-focused dimension was not addressed at all. Additionally, the category **adaptation** was not sufficiently discussed in neither of both sources**. Vulnerability** in contrast was not being addressed in the curriculum but it appeared in the policy documents. Consequently, by summarizing the characteristics of CCE in Ethiopia more general, the dimensions of **vulnerability** and **mitigation** are well-represented, with a focus on understanding environmental impacts. Furthermore, both the **cognitive** and **action-oriented** dimensions are present, encouraging critical thinking about climate change and active involvement through environmental initiatives. The **socio-emotional** category is less directly emphasized but it is supported through activities that foster emotional resilience. Moreover, the **justice-focused** dimension is the second least represented, with some mention of gender equality and integration of indigenous knowledge in the general educational context but not specifically within CCE. The least represented or rather missing dimension is **adaptation** since it is not being mentioned at all.

To answer sub question three, the results of the analysis of UK curricula and the policy documents are being taken into account. The curriculum and the policy papers have in common that both of the source's state that topics around **mitigation** and the **cognitive** dimension of "good" CCE are being implemented in their schools CCE. Although for the cognitive category one important aspect, which are the critical thinking skills, is missing in the policy documents but it is implemented in the overall curriculum. The topic of **vulnerability** is vaguely addressed in the policy documents, but it is further explained in the curriculum by giving examples. **Adaptation** was not included in the curriculum, but it was thematized in the policy documents. Regarding the remaining dimensions of "good" CCE, there is a stark difference between the analyzed curriculum of 2014 and the policy documents. In the curriculum the **socio-emotional,**

**action-oriented** and **justice-focused** dimensions were not discussed at all but in the policy documents both topics relating to the **socio-emotional** and **action-oriented** categories were raised to a full amount. The justice-focused dimension is left out in both sources of analysis. Hence, by summarizing the characteristics of CCE in the UK more general, **vulnerability** and **adaptation** are recognized, through emphasising the understanding of climate impacts and resilience measures, although it is not very specific. Additionally, topics regarding **mitigation** are strongly emphasized. The **cognitive** dimension is included although, there is less emphasis on critical thinking to navigate misinformation. Furthermore, the **socio-emotional** and **action-oriented** dimension are well represented. Lastly, the **justice-focused** dimension is not incorporated to a sufficient degree.

So, what is the answer to the main research question of *how approaches to climate change education in Ethiopian and English school systems differ in terms of the climate scientific and "good" climate change theoretical streams?* Regarding the scientific theoretical stream, Ethiopia places more emphasis on vulnerability by addressing local environmental issues, whereas the UK focuses on broader topics but less detailed. The UK incorporates adaptation strategies more explicitly than Ethiopia within its policies, by setting their focus on resilience against climate impacts. Ethiopia's adaptation discussions in contrast are broader and less detailed. Furthermore, both countries emphasize mitigation. However, the UKs strategies are tied closely to national emission reduction goals, while Ethiopia focuses on sustainability practices. Looking at the "good" climate change theoretical stream, it became apparent during the analysis that both systems aim to educate about the causes and effects of climate change. Ethiopia emphasizes local impacts and solutions more, while the UK covers a broader range of scientific knowledge. Moreover, the UK more explicitly addresses emotional resilience and hope, whereas Ethiopian education supports resilience more indirectly through its focus on local challenges. Further, both countries integrate practical, action-oriented learning that engages students in active environmental learnings. Lastly, both countries show limited focus on climate justice since discussions on equity and rights are not really integrated into the climate educational content.

Through the analysis several key insights can be determined. The UK and Ethiopia integrate the scientific and "good" CCE frameworks differently. Ethiopia is focusing on local environmental realities and vulnerabilities, and the UK is incorporating a broader and less detailed CCE that includes global climate dynamics and resilience strategies. The differences

between policy documents and actual curricular content in both countries highlight a gap between educational policy intentions and classroom implementations. This is especially evident in the Ethiopian context where in the policy document's various themes are discussed that are less visible in curriculum specifics and in the UK the policy documents include a lot more information on the dimensions of "good" CCE than in the curriculum. Moreover, the general minimal focus on justice-related aspects of climate education in both educational systems show a potential area for further development, especially given the threat of climate change impacts and the need for an equitable approach to environmental issues which should be reflected in the education.

## 6.2. Limitations

A limitation in choosing Ethiopia and the UK for the comparative case study is that the countries have very different cultural, societal and economic contexts. These differences can also influence how CCE is incorporated and perceived in the countries and analyzing these effects as well in this research goes beyond the scope. Furthermore, there is a disparity in resources between the two countries since the UK has a more developed educational system and a higher funding level than Ethiopia. This could also have an impact on how CCE is included in the Ethiopian education. Moreover, when considering the analysis and its results, it's crucial to note that the research was conducted by an individual from the Global North, using only translated documents for Ethiopia. Even though Ethiopian documents are translated into English, nuances in language and specific terminology related to climate change might be lost or misinterpreted in translation. This can lead to misunderstandings or misrepresentations of the intended policies or curriculum content. Lastly, this research focuses on CCE of secondary school level in the UK and Ethiopia in a national and therefore general way. With this the study risks generalizing findings across both contexts without adequately accounting for intra-country variations. Both Ethiopia and the UK have diverse regions with potentially different educational needs and responses to climate education, which might not be fully captured in a national-level analysis.

## 6.3. Suggestions for further research

How does this research fill the knowledge gap? This research has expanded existing research by exploring how CCE is included in two different but still comparable countries. Prior research regarding the topic of CCE in schools have analyzed curricula in various countries but the combination of curricula and policy documents offers a broader insight in the countries'

CCE. Furthermore, by combining two theoretical streams and especially by incorporating aspects of "good" CCE makes this analysis stand out and fill a significant gap in the literature. By doing this, CCE was not only analyzed in terms of content but also regarding socio-emotional and action-oriented education approaches. By analysing CCE in Ethiopia and the UK, this paper considers the distinct realities and impacts of climate change that each country faces and examines how these are reflected in their respective educational approaches. Furthermore, by choosing to take a country from the Global North and one from the Global South the analysis might have been more complicated than taking two countries with the same background but this way attention was given to existing inequities between them, regarding climate change. However, during the research it became apparent that although the UK is less vulnerable to climate impacts, they do have CCE included in their education to a very sufficient extent. Moreover, this analysis has discovered specific gaps where theoretical intentions (as outlined in policy documents) do not fully translate into educational practice. This research could be expanded by conducting interviews in both countries with teachers and students to see what the reality of CCE looks like in the classroom and not only in certain documents. Further research could conduct longitudinal studies to track the impact of CCE on student attitudes and behaviours over time, particularly looking at how these educational interventions impact climate action and resilience in adulthood. Moreover, research on more countries with varying vulnerabilities and responsibilities for climate change could provide deeper insights into the global practice of CCE and help develop more globally applicable educational strategies.

## 6.4. Practical implications

So, what needs to be done? Policymaker can use the results of this thesis to assess their national curricula in order to identify if they can incorporate or build on mentioned strengths of CCE of the UK and Ethiopia and if they might have similar gaps, such as the lack of justice-focused content. By doing this, CCE could be improved in multiple countries. Additionally, both Ethiopia and the UK can learn from each other since both countries have strengths and weaknesses in their CCE and by complementing each others CCE it would be overall more inclusive. Moreover, the government of both countries should ensure that CCE policies are effectively translated into the curricula and classroom practices. This can be achieved by the joint work of educational authorities, school administrations and teachers through regular workshops for teachers and updating the curricula. Furthermore, the justice-focused dimension should be included in the school curricula of both countries to provide students with knowledge

on climate justice. The resources needed for that should be supplied the government or by a donor, funding teacher training programs and the updating of school curricula.

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# Appendix

**Ethiopia**

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**Detailed Coding scheme**

| Category | Codes | Example |
|---|---|---|
| | Biodiversity | "(..)offering children and young people the opportunity for hands-on action improving biodiversity, learning data science skills, and finding out about nature's role in climate change" (Department for Education2 2023) |
| | Vulnerability | "Let students understand socially climate effects such as hunger, poverty and diseases like diarrhea and malaria disproportionately impact children (..)" (Environment, Forest and Climate Change Commission 2019) |
| | Hazards | "Let students prepare a story about a common environmental hazard that was reported in the news and read to the class" (Environment, Forest and Climate Change Commission 2019) |
| Vulnerability to climate change | Environment | "Documents developed on the following National Pressing and Cross Cutting Issues:<br>- (…) |

| | | |
|---|---|---|
| | | - Environment and Climate Change (…)" (Ababa, 2020) |
| | Consequences of climate change (CC) | "(...) potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate" (Department for Education 2014) |
| | Energy efficiency | "(...) renewable and non-renewable energy sources used on Earth; changes in how these are used." (Department for Education 2014) |
| Mitigation | Sustainability | "Building on a foundation of fundamental numeracy, literacy and broad academic knowledge, all children learn about:<br><br>- nature<br><br>- the causes and impacts of climate change the<br><br>- importance of sustainability" (Department for Education1 2023) |
| | Mitigation | "Let students brainstorm and list down all the consequences that. occur from the exploitation of resources" (Environment, Forest and Climate Change Commission 2019) |

| | | |
|---|---|---|
| | Resilience | "Vision: Environmentally conscious citizens created at all levels of education with proper knowledge, skills and attitude that enhance Ethiopia's climate resilience (…)" (UNCC n.d.) |
| Adaptation | Disaster risk reduction | "Develop a preparedness strategy and plan to ensure continuity of education in emergencies" (Environment, Forest and Climate Change Commission 2019) |
| | Community-based adaptation | "Building green and resilient communities" (Environment, Forest and Climate Change Commission 2019) |

"Good" climate change education

| Category | Codes | Example |
|---|---|---|
| | Causes of climate change | "positive and negative human interactions with ecosystem" (Department for Education 2014) |
| Cognitive | Pollution | "how emission of greenhouse gases negatively affect the climate" (Environment, Forest and Climate Change Commission 2019) |
| | Critical thinking | "Environmentally conscious citizens created at all levels of education with proper knowledge, (..)" (UNCC n.d.) |

| | | |
|---|---|---|
| | Environmental protection | "Environmental protection, climate change and green legacy are high priorities at national level. As a result, educational institutions and communities are strongly committed to tree planting on school grounds and soil conservation on and off school grounds." (Ababa 2021) |
| | Climate change | "The UK is strengthening awareness of and building consensus in tackling climate change through various education initiatives at all stages of life, including: a new education course on climate science for 16- to 18-year-olds" (GOV UK 2022) |
| | Emotional resilience | "Each of the cross-cutting issues aims to promote positive attitudes, values and behavioral changes necessary for meaningful personal and social life" (Ababa 2020) |
| Socio-emotional | Coping strategies | "Allow students to understand the impact of industrial waste on the climate and let them express their thought on solving the issue." (Environment, Forest and Climate Change Commission 2019) |
| | Empowerment | "This is to ensure all young people today and generations to come are equipped with |

| | | |
|---|---|---|
| | | the knowledge and understanding, and are empowered, to respond to and tackle the climate and ecological crisis facing our planet." (University of Reading n.d.) |
| | Motivation for action | "(..) provide platforms and access for young people at local, national and international levels to influence and participate in policy and decision making on climate action and adaptation." (British Council n.d.) |
| | Environmental activism | "Voice for the environment to save the climate" (Environment, Forest and Climate Change Commission 2019) |
| | Youth engagement | "(…)youth panel so young people could share their views and inform the development of the strategy." (GOV UK 2022) |
| Action-oriented | Student-led initiatives | "In the last two years young people have motivated many in the education system, as well as friends and family, to improve their climate education. As a result, a number of national, regional and local networks have developed to allow discussion and promotion of climate education" (University of Reading n.d.) |

| | | |
|---|---|---|
| | Project-based learning | "(…) project work, presentations, displays, field work, debates, (…)" (Ababa 2020) |
| | Sustainable lifestyle | "(…) exposed to sustainable food choices, recycling, adaptation projects or weather and energy monitoring" (Department for Education1 2023) |
| | Climate justice | - |
| | Gender equality | "(…) improve girls' access to quality education, participation, achievement and completion" (Ababa 2021) |
| Justice-focused | Indigenous knowledge | "Use Indigenous Knowledge and Values" (Ababa 2020) |
| | Equity | "There should not be discrimination in the provision of educational opportunities because of differences in religion, gender, beliefs, ethnic group, physical and mental ability or disability, economic background, culture and traditional practices as well as geographic areas" (Ababa 2020) |
| | Advocacy for marginalized communities | - |