Republic of Kenya

Ministry of Environment and Forestry

Guidelines for Mainstreaming Climate Change in curricula at all Levels of Education and Training

May, 2021

Table of Contents

PREFACE

In recognition that education is a critical agent in addressing the issue of climate change, the government of Kenya through the Ministry of Environment and Forestry in collaboration with the Ministry of Education is mainstreaming climate change in educational curricula at all levels.

In 2010, the Government launched the National Climate Change Response Strategy which enhanced understanding of the global climate change and the impacts of climate change in Kenya.Further the government developed the Climate Change Act, 2016 that is being implemented through the National Climate Change Action Plans. The plans provide guidance and priority actions on addressing climate change taking into consideration Vision 2030.

Equally, the international community including Kenya has formally accepted ambitious mitigation goals through ratification of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). The agreement aims at, limiting global warming to well below 2 C and efforts should be pursued to hold it to 1.5 C (UNFCCC, 2015). However, a formidable emissions gap remains between the aspirational goals of the Paris Agreement and the real-world pledges and actions of nations. It is then argued that closing the emissions gap can only be achieved if education gap between scientific and societal understanding of climate change is also closed.

Therefore addressing climate change effectively require transfer and use of knowledge through education, that enables informed decision making and action at all levels in society. This education may include formal primary, secondary, tertiary, and adult education; professional development; worker training; and learning through informal means (i.e., through cultural and social experiences).

Inspired by the commitment to implement the climate change action plan and other regional and international commitments, the ministry of Environment and forestry has developed these guidelines for curriculum developers and implementers to mainstream climate change in the education curricula. These guidelines have been developed through a wide stakeholder's consultative process. The guidelines provide information on how climate change can be mainstreamed in the education sector so as to progressively create understanding, change behavior and attitude towards addressing climate change.

Through these guidelines, the curricula developers are expected to mainstream climate change aspects so that there will be the understanding, acquisition of knowledge and skills, application of concepts in climate change. Finally the acquired competencies will assist in the implementation of the global and national goals on climate change.

Acknowledgements

Executive summary

These guidelines are a set of recommendations to assist curriculum developers to design teaching and learning experiences to integrate climate change and related emerging issues at all levels of education. The goal of integrating climate change into curricula is to enhance understanding of climate science, causes and impacts of climate change, and the appropriate responses required to address its challenges while taking advantage of opportunities of climate change. The use of the education system as an avenue to address climate change is premised on the fact that anthropogenic causes of climate change can be reduced and even eliminated through behavior change resulting from the acquisition of relevant knowledge, skills, competences and attitudes in climate change.

The development of these guidelines follows the enactment of the Climate Change Act 2016 (section 21 subsection 1 and 2) which provides for KICD and other government agencies responsible for developing and regulating university and tertiary institutions' curricula to integrate climate change into various disciplines, and subjects of the national curricula at all levels. The guidelines also serve to fulfil Article 6 of the United Nations Convention on Climate Change (UNFCCC) to develop and implement education and training programs including strengthening of national institutions and exchange secondment of personnel to train experts in this field particularly in developing countries. The Guidelines also follows the President of Kenya's directive to develop curriculum to integrate climate change into Education system to respond to the adverse impacts of climate change to the citizens.

The guidelines provide a general overview of the situational analysis with regard to climate change emphasizing the necessity to undertake measures to appropriate responses to the challenges brought about by this global problem. The purpose and objectives of the guidelines are set out while taking note of the policy, legal and institutional framework providing foundation for the guidelines. The guidelines cover six broad areas namely understanding climate change; appropriate knowledge, skills and competencies; efficient production and utilization of resources; whole school approach; fulfilment of global obligations; and research and innovation. An implementation framework and a mechanism to monitor and measure success is also provided, highlighting the

key performance indicators and the various timelines necessary for the successful implementation.

CHAPTER 1.0: INTRODUCTION

1.1 Background

Climate change is one of the most serious global challenges of our time whose estimated future economic costs of impacts may exceed 5% of Kenya's Gross Domestic Product (per year) by 2050 (SEI, 2009)[1]. The IPPC Special Report on 1.5^0C indicates that extreme weather events are expected to increase in intensity and frequency if the average global temperature rise is allowed to exceed 1.5^0C above pre-industrial levels and should therefore serve as a call to action.

Appropriate mitigation and adaptation actions are needed to address the expected negative impacts of climate change on the country's future development prospects, the achievement of Kenya Vision 2030 goals and the Big Four agenda.

Education has been singled out as a critical tool which can be used to influence a society's response to climate change, the associated challenges, risks and opportunities and thus climate change should be made an essential part of learning.[2] Despite the high literacy levels in the country, the education system has lagged behind in imparting skills, attitudes, values and behaviors necessary for climate action at individual or society wide levels.[3] Therefore, climate change should be integrated into curricula at all levels of learning to enhance the ability of learners to receive, understand, appreciate and share information.

Developing countries, including Kenya, have least contributed to the current climate change compared to developed countries. However, they are the most exposed and vulnerable to the risks of climate change and hence the need to take all necessary actions to ensure that the citizenry are adequately prepared to face the challenges of climate change.

These guidelines aim to provide a reference point for curriculum developers at all levels of education ranging from pre-primary, primary, secondary, and tertiary (colleges and universities). The curriculum developers will be expected to develop curricula on climate change and the related concept like the green economy and hence designing contextualized learning experiences that capture

---

[1] SEI 2009

[2] See Article 6 of UNFCCC, Article 10 of Kyoto Protocol and Article 11&12 of the Paris Agreement, Article 43 (f) of the Constitution of Kenya 2010, and Article 21 (1) and (2) of the Climate Change Act, 2016

[3] See chapter 36 of Agenda 21

current and emerging issues in the area of climate change and low carbon development in a manner that is easily understood and appreciated by learners.

1.2 Situational Analysis

Since independence, Kenya has developed a number of education policies geared towards provision of quality, targeted and complete education. These policies were developed to address periodic emerging issues needed to be integrated into the education system. The Kenya Education Commission (1963), was the first such commission whose mandate was to survey existing education resources in Kenya and advice the government on the formulation and implementation of national policies of education. It recommended the reform of the education system inherited from the colonial government to make it responsive to the needs of independent Kenya. Climate change was not an issue of concern at that time and hence not formally acknowledged in Kenya's education curricula. Other reviews, including the review that crafted the 8-4-4 system of education failed to incorporate climate change in the curricula, except in some tertiary courses.

1.3 Education for sustainable development and climate action in Kenya

The 2030 Agenda's goal on climate action (Goal 13) recognizes that the climate crisis is linked to many other global issues. In addition, Goal 4 on quality education both recognize the importance of Education for Sustainable Development and the role of education in responding to climate change. Through ESD, learners should acquire necessary values and skills to participate in the transition to more sustainable lifestyles, green economies, sustainable and climate resilient societies. Kenya launched the Education for Sustainable Development Policy for the education sector in 2017, which incorporates climate change.

1.4 National Climate Change Response Strategy

The National Climate Change Response Strategy (NCCRS, 2010) noted that the major concern in Kenya was inadequate climate change information, knowledge and data to researchers, planners and policy makers. It recommended curricula review to integrate climate change into the Kenya's education system. The development of the education sectionin the NCCAP 2013-2017 for integrating climate change into the education system was informed by the concern identified in the NCCRS.

1.5 National Climate Change Action Plan (NCCAP)

During the development of the NCCAP 2013-2017, curricula content analysis and interviews were conducted to establish the extent to which climate change has been integrated into Kenya's education system. Content analysis involved examination of the relevant education policy documents since independence. Also analyzed were present curricula of primary, secondary and tertiary levels of education all of which were developed by the Kenya Institute of Education (KIE). In the case of universities, in-depth interviews were held with heads of departments of relevant sections where climate change courses could be taught. Approaches that were identified as the most effective methods for integrating climate change in the education system included integrating new courses at tertiary institutions, introducing compulsory common units at the university and introducing in post school institutions climate change as stand-alone courses. NCCAP 2013-2017 recommended revising of the existing curricula in learning institutions to include content to address climate change.

NCCAP 2013-2017 recommended that:

i.   Developers of the primary school curriculum make a conscious effort to introduce climate change and its impact into the primary school subject matter by integrating it into all subjects to the extent possible.

ii. Integrating climate change in secondary education should happen through the introduction of content that makes learners aware of the need to develop climate adaptation and mitigation capacities for the country. Courses touching on specific areas such as clean energy alternatives and reduction of deforestation should then be introduced incrementally at secondary school level.

iii. Whereas it is desirable for Kenyans to adopt solar technology on a mass scale, supportive networks for installation and maintenance of solar power systems are not well established nationally. Furthermore, standards for such system are non-existent. The same can be said of other technologies such as geothermal and wind. There is therefore an opportunity to train technicians with these skills to support the widespread adoption of adaptation and mitigation practices needed to support the National Climate Change Action Plan (NCCAP).

iv. Climate change permeates all sectors of the economy and because of that; climate change should be infused into the various professions taught at universities in Kenya. Civil engineers for example need tolearn how to design and develop structures that can withstand climate shocks; doctors need to be aware of the effects of climate change on human health, while architects should have the skills and training to design houses that need minimal energy to run and maintain. Teachers ought to be equipped with knowledge about climate change in order for them to be suited to teach a curriculum that integrates climate change across all subjects taught at schools in Kenya. Whereas it was already the case that climate change as a subject is now being taught at some Kenyan universities there was need for institutions of higher learning to develop policies to ensure that all students trained there are familiar with climate change and its impacts.

1.6 Climate Change Act

The Climate Change Act 2016 (section 21) requires the Kenya Institute of Curriculum Development (KICD) on advice of the Council, to integrate climate change into various disciplines and subjects of the national education curricula at all levels. The Act also requires the Council to advise the public agencies responsible for regulating universities and tertiary institutions on integration of climate change into their curricula.

1.7 Rationale

Although climate change information is now readily available, the country is still unprepared to respond effectively to climate change, due to inadequate public understanding of climate change issues and opportunities for effective response. However, the reality of global climate change has led to increasing urgency for effective education on climate change from broad societal action to climate smart choices at the household level. These guidelines seek to help curriculum developers to design curricula that enhance understanding of the climate systems, climate change science, and the impacts of climate change, mitigation and/or adaptation and related issues at all levels of education in Kenya. This will lead to diverse professionals who are able to come up with climate change solutions relating to the issues of their disciplines. These guidelines will therefore help the curriculum developers to facilitate the integration of the climate change in curricula in a more coherent, progressive and systematic manner.

1.8 Purpose and Objectives

The overall purpose of these guidelines is to mainstream climate change into the curriculum at all levels of education.

The specific objectives of the guidelines are to provide curriculum developers with guidelines on designing curricula that enables learners to;

1) Understand climate change and its impacts

2) Acquire appropriate knowledge, skills and competencies to respond to climate change

3) Appreciate efficient production and utilization of resources

4) Apply whole institution approach in teaching and learning

5) Promote implementation of global, regional and local climate change action plans

6) Promote research and innovation in climate change

1.9 Scope

These guidelines shall apply to all curriculum developers at all levels.

CHAPTER 2.0 POLICIES, LEGAL, AND INSTITUTIONAL FRAMEWORKS

The need to inculcate climate change knowledge early in life is key in changing public mind sets, perceptions and attitudes towards climate change. Policies, legal and institutional frameworks have been developed both at the global and national level to address this gap. In line with this, Kenya has signed and ratified a number of treaties and conventions related to climate change and education. It has also developed a number of policies guiding management of climate change response.

2.1 Global level

At the global level the following conventions and treaties have recognised education, training, public awareness and capacity building as an important component in climate change adaptation and mitigation strategies.

2.1.1 United Nations Framework Convention on Climate Change (UNFCCC).

The UN Framework Convention on Climate Change (UNFCCC) is an intergovernmental treaty developed to address the problem of climate change. The Convention sets out an agreed framework for dealing with this issue. In order to do this the countries have to raise awareness on the need foraction among stakeholders, including key government ministries to mainstream and integrate climate change into national planning and development processes.

Article 6 of UNFCCC on Education, training, and public awareness seeks to reduce the impact of climate change by enabling societies to be part of the solution. It encourages people to take the lead and cooperate in creative climate change education and training. This calls for initiatives that are diverse, innovative and resource-efficient. They include practical action in formal and informal education and training that cut across different types of learning, from pre-school, to vocational training and universities for lifelong learning.

2.1.2 Kyoto Protocol 1997

The Kyoto Protocol is an international agreement linked to the UNFCCC, which commits its Parties by setting internationally binding emission reduction targets. It recognizes that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere. The Protocol requires countries to meet their targets primarily through national measures. The measures help to stimulate green investment and help countries to meet their emission targets in a cost-effective way. The protocol requires the countries to cooperate and promote the development and implementation of education and training programmes to facilitate public awareness and access to information on climate change.

2.1.3 Paris Agreement

Article 12 of the Paris Agreementcalls for countries to cooperate in taking measures to enhance climate change education, training, public awareness, public participation and public access to information. The agreement recognized that for development and implementation of education and training programmes to take place countries should take measures to enhance climate change education. It aims to achieve this by increasing adaptability to the adverse effects of climate change and promoting climate resilience and low carbon development.

2.1.4 Sustainable Development Goals (SDGs)

The Agenda 2030 is "a plan of action for people, planet and prosperity". It comprises of 17 Sustainable Development Goals (SDGs). All the SDGs have an aspect of climate change, thus is an important tool for responding to climate change. Sustainable Development Goal 4 (SDG 4) on education aimsat ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all. Target 4.7 is to ensure that all learners acquire the knowledge and skills needed to promote sustainable development, through education for sustainable development and sustainable lifestyles.

The Sustainable Development Goals provide a window of opportunity for creating multidimensional operational approaches for climate change actions. Sustainable Development Goal 13 aims to take urgent action to combat climate change and its impact. Climate change mitigation (SDG 13.3) aims at improving education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

Sustainable Development Goal 4.7 aims to ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles.

2.2 Regional

2.2.1 East African Community

The East African Community (EAC) Secretariat developed a Climate Change Policy and Strategy (2010) to guide partner states and other stakeholders on the preparation and implementation of collective measures to address climate change in the region. The Policy prescribes statements and actions to guide adaptation and mitigation to reduce the vulnerability of the region, enhance adaptive capacity, and build socioeconomic resilience of vulnerable populations and ecosystems. The EAC is developing a climate change bill and forest policy and strategy; and exploring the establishment of an alliance on carbon markets and climate finance.

2.2.2 African Ministerial Conference on the Environment

Ministers have also committed to continue taking concrete actions to address environmental challenges and climate actions to unlock inclusive wealth creation that safeguards the socio-economic wellbeing of Africa.

2.2.3 African Union

One of the thematic pillars of action for the union is to enhance research, awareness, advocacy and education on climate change. Goal 3 is to enhance

networking and provide support to regional climate centers, universities and research institutions to contribute to capacity building and development of new and emerging research, education, awareness raising and advocacy tools. Goal 36.2 is to enhance communication, education and awareness-raising at all levels in relation to climate change impacts. Public education and outreach programs on climate change communication for citizens is one of the actions.

2.2.4 Agenda 2063

The agenda addresses the global challenge of climate change by prioritizing adaptation in all actions, drawing upon skills of diverse disciplines with adequate support (affordable technology development and transfer, capacity building, financial and technical resources) to ensure implementation of actions for the survival of the most vulnerable populations. Africa participates in global efforts for climate change mitigation that support and broaden the policy space for sustainable development and speaks in one voice and unity of purpose in advancing its position and interests on climate change.

2.3 National

In response to climate change threats, the Government of Kenya has put in place overarching policy and legal frameworks for climate Change governance including:

2.3.1 Constitution of Kenya (2010)

The Kenya Constitution states under article 42 states that every person has a right to a clean and healthy environment and that should be protected for the benefit of present and future generation through legislatives and other measures.

2.3.2 Environment policy

The policy recommends public participation, environmental education and awareness.The environment policy recommends for development of a National Environmental Education Curriculum examinable at primary, secondary and tertiary levels. It highlights use of public education and awareness to build support on measures of promoting appropriate technology transfer and capacity building.

2.3.3 The Climate Change Act, 2016

The Climate Change Act, Section 21 also calls KICD on advice of the council should integrate climate change into various disciplines and subjects of the national education curriculum at all levels for integration of climate change into the national education curriculum at all levels. The council shall advise

public agencies responsible for regulating universities and tertiary institutions curricula on integration of climate change into the curricula.

2.3.4 National Climate Change Response Strategy (2010)
The strategy recommends incorporation of climate change into the nation's educational curricula at different levels, starting with primary through to tertiary institutions.

2.3.5 National Climate Change Action Plan
The NCCAP is anchored in the Climate Change Act 2016, recommends mainstreaming of climate change actions in development planning, budgeting and implementation processes.

The NCCAP 2018-2022 is an implementation tool that sets out priority action areas to implement the various issues that have been raised by the initiatives. It recommends integrating climate change in the education system, emphasizing integration in existing curricula for lower secondary grades 7, 8 and 9.

2.3.6 National Adaptation Plan (NAP, 2015-2030)
Recommends that Kenya Institute of Curriculum Development (KICD) to advice the climate change council to integrateclimate change into various disciplines and subjects of the national education curricula at all levels and advise public agencies responsible for regulating universities and tertiary institutions curricula on the integration of climate change into their curricula. The plan also advises that climate change adaptation be mainstreamed in the formal, non- formal and informal education and training.

2.3.7 Green Economy Strategy and Implementation Plan (GESIP) 2016-2030
The plan recommends that public awareness campaigns be mounted to ensure that the widest possible audience is   reached, incorporate both traditional and new media including use of social media platforms to promote a transition to a green economy. It also recommends exchange of knowledge and information among different stakeholders.

2.3.8 National Climate Change Framework Policy (2018)
The policy requires the Government to mainstream climate change in basic, secondary and tertiary level education curricula. Mainstreaming climate change knowledge into the basic education curriculum will provide knowledge and awareness at all levels.

2.3.9 Medium Term Plan III on Vision 2030

Vision 2030 through MTP III provides for opportunities to mainstream climate actions into development planning, decision making and implementation in all sectors of the economy at national and county levels to ensure sustainable development. This is to promote low carbon climate resilient development and ensure that investments are climate proofed against climate change relatedshocks and that development does not adversely impact on the environment. Additionally, climate change mitigation actions will facilitate achievement of the "Big Four" initiatives especially relating to food and nutrition security and health.

2.3.10 National Climate Finance Policy (2018)

The policy recommends Research institutions and universities to play a key role in research education, capacity building and establishment of centres of excellence on clean technologies, climate financing and emissions trading. The government should provide training in areas related to climate finance particularly for matters related to fiduciary management and environmental and social safeguards.

2.3.11 Basic education Act, 2013

The cabinet secretary upon advice of the national education board should advice the government on the promotion of environmental protection education for sustainable development

2.3.12 Environmental management and coordination Act, Cap 387

Section 9m recommends NEMA to coordinate and undertake in corporation with lead agencies programmes intended to enhance environmental education and public awareness about the need for sound environmental management.

2.4 INSTITUTIONAL ARRANGEMENTS

Implementation of these guidelines will be coordinated jointly by both Ministry of Environment and Forestry and Ministry of Education as per the guidance issued by National Climate Change Council. Various institutions shall be engaged as indicated below.
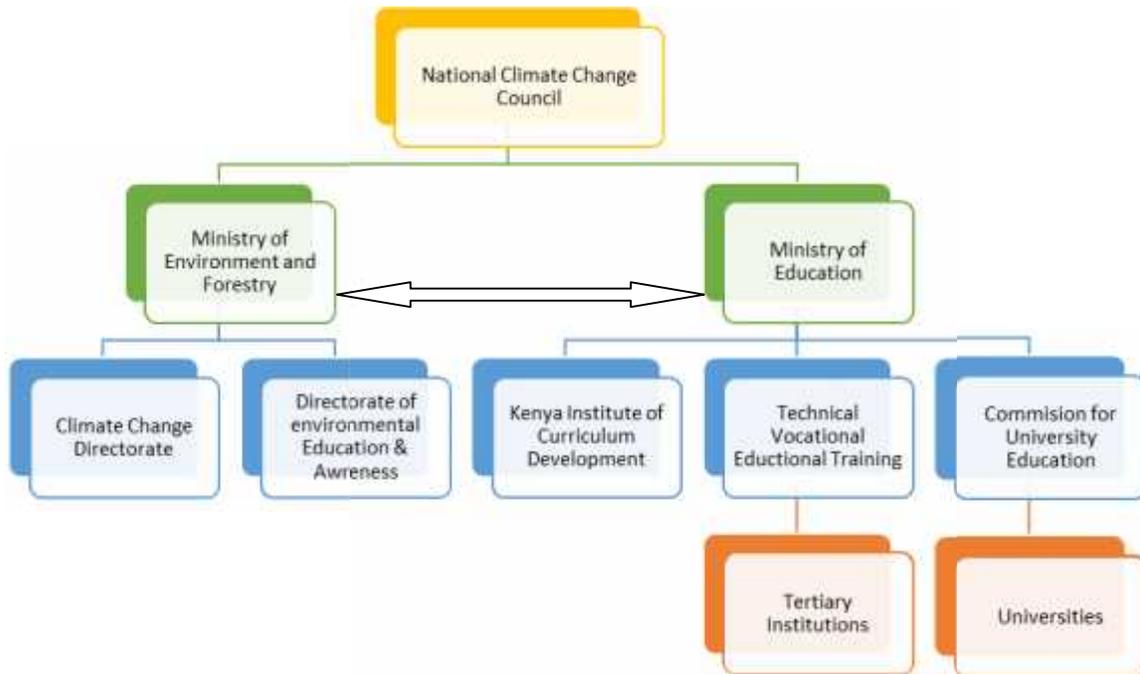
CHAPTER 3.0 MAINSTREAMING CLIMATE CHANGE IN CURRICULA

Kenya's education system has advanced in most fields. However, appropriate knowledge and skills to respond to climate change is still a challenge as it has not been mainstreamed in the education curriculum.

3.1 Understanding climate change and its impacts

Climate change is one of the major challenges of our time. Its impacts are felt across the globe, affecting people, nature and economies. In order to mitigate and adapt to climate change, there is need to reduce global emissions of greenhouse gases significantly and devise means of coping with the changing climate. Developing these mitigation and adaptation measures requires understanding of a complex system linking emissions from different sources to national and regional impacts. It is important to understand the sources, the

concentrations of greenhouse gases and other pollutants and their contribution to climate change now and in the years to come.

According to UNFCCC Intergovernmental Panel on Climate Change (IPCC) assessment report, the earth's climate is changing, primarily as a result of human activities. The UNFCCC emphasizes the need for countries to educate people on climate change, as the understanding is key to winning support for climate-related policies which is also echoed by the Kyoto Protocol and the Paris agreement. Improved climate change education raises awareness about human and institutional capacity on climate change mitigation, adaptation and impact reduction, as well as on early warning systems. The education promotes mechanisms for raising capacity and understanding for effective climate change-related planning and management.

The global progress on the implementation of the sustainable development goal on climate action is measured on the integration of mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula.

Kenya therefore seeks to pursue the goal at the earliest opportunity. The National Climate Change Action plan 2018-2022 also calls for integration of climate change in the education system, emphasising on integration in existing curriculum for the understanding of the various aspects on climate change.

Therefore these guidelines propose that curriculum developers should ensure that curricula are designed to enhance learner's understanding of

- The changing climate

- The drivers of climate change

- Indicators and monitoring of climate change

- Associated social, environmental and economic impacts of climate change

- Responses to Climate change, its impacts and opportunities.

- Resilience, Adaptation and Mitigation actions

3.2 Appropriate knowledge, skills and competencies to respond to Climate Change

The effects of climate change are already being felt and therefore the education sector can play a critical role in imparting relevant knowledge, skills and competencies to respond to climate change. Curriculum developers should design curricula that integratesclimate changeeducation for community resilience, climate proofing and empowering learners to respond to climate change. Learners need basic knowledge of the history, the science, causes and consequences of climate change as well as mitigation and adaptation practices that can contribute to building resilience and sustainability.

SDG 13 – Climate action **Target 13.3:** provides for Improvement of education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation,

The national climate change strategy (2010) emphasizes the importance the incorporating climate change into the nation's educational curricula at different levels, starting with primary through to tertiary institutions.

The national action plan (2013-2017) promotes integration of climate change in the education system and in all other professional practices.

Appropriate knowledge, skills and competencies through participatory teaching and learning motivates and empowers the learners to change their behaviour and take appropriate climate action.

Curriculum developers should design the curricula that;

- Integrate climate change knowledge in subjects and disciplines
- Promote critical, creative and futures thinking relevant to climate change
- Promote activities that minimize the effects of climate change
- Empower learners to take appropriate climate action

3.3 Efficient production and utilization of resources

The production of goods and services involves utilization of scarce natural resources, such as water and energy. Efficient production systems ensures that less of these resources are utilized per unit output, while efficient utilization of resources eliminates the need to produce more, hence reduce or eliminates waste.

The SDG 12 supports responsible consumption and production that promotes climate change adaptations and mitigation. Target 2 of SDG 12 focuses on efficiency use of natural resources, target 5 focuses on reduce, re-use and re-cycle(circular economy),target 6 encourages adoption of sustainable practices and finally target 7 enhances sustainable procurement of natural resources.

The National Climate Change Response Strategy (NCCRS 2010) and Climate Change Framework Policy (CCFP) identifies energy efficient innovations and technologies as a means of responding to the impacts of climate change and creation of green jobs. Such include energy efficient motor-vehicles, electrical gadgets, buildings, cooking solutions etc.

The Green Growth Strategic Implementation Plan, GESIP (2016-2030) provides for sustainable production and consumption patterns and lifestyles as well as circular economy. GESIP also focuses on promoting resource efficiency as a strategy to identify ways in which resource usage can be optimized, minimizing costs and impacts. A circular economy is an economic system aimed at eliminating waste and the continual use of resources. Circular systems employ reuse, sharing, repair, refurbishment, remanufacturing and recycling to create a close-loop system, minimizing the use of resource inputs and the creation of waste, pollution and carbon emissions

In order to impart relevant knowledge skills and competencies curriculum developers should ensure that learners are enabled to:

- Take stock of the resources and production activities that contribute to climate change
- Demonstrate the benefits of efficient production and utilization of resources.
- Demonstrate the benefits of circular economy in managing climate change

3.4 Application of whole institution approach in teaching and learning

A whole institution approach aims at raising quality and standard across the entire institutions. It involves identifying and addressing the needs of institutions community and engage in continuous cyclical processes for improvement. It means all members of institutions community (leaders, middle management, teaching and non-teaching staff, learners, parents and families) feel responsible and play a role in tackling educational issues. It also implies across-sectorial approach and strong cooperation with wide range of

stakeholders (social services, youths, outreach workers, psychologists, guidance specialists, local authorities, NGOs, unions, volunteers etc. and the community at large) to deal with issues which do not have relevant expertise**https:/ec.europa.eu/programmes/Erasmus-plus/project.** Hence the concept of whole institutions approach allows for the entire system of actors and their inter relationships in and around institutions to be considered, acknowledging that each stakeholder has a part to play in supporting the learners educational journey and nurturing their learning experience.

In practice, whole institution approach incorporates teaching and learning for sustainable development not only through aspects of the curriculum, but also through sustainable operations such as integrated governance, stakeholder and community involvement, long-term planning, active and participatory learning.Whole institution approaches call for involvement of all stakeholders including learners, parents, educators and administrators, to be actively engaged in working towards a sustainable institution with ESD fully integrated into the curriculum as the driving factor (Hargreaves, 2008, Wick, 2013, KICD, 2016).

To mainstream climate change into learning institutions, the whole institution approach should be applied and therefore curriculumdevelopers should design learning and teaching experiences that;

- Develop and enhanceinstitutionalculture (values, beliefs and expectations)on climate change and environmental sustainability, including environmental planning, waste management and pollution control, climate change mitigation and adaptation, environmental ecological enhancement, environmental education and awareness and promoting environmental protection through partnership;

- Promoteknowledge of climate change and environmental sustainabilitythroughinstitutionalactivities (clubs/teams, poems, drama, festivalsetc.);

- Promote Integration of indigenous and local knowledge on climate change in curriculum;

- Promote institutional practice towards being aCentre of excellence on climate change adaptation and mitigation;

- Promote the Implementation of the circular economy and green technologies and practices;

- Partner with communities to develop teaching, learning and research;

- Inculcates behavior change and paradigm shift in response to climate change challenges.

3.5 Promote implementation of global, regional and local climate action plans

The global, regional, and national climate change actions sets standards that need to be maintained on various aspects of climate change. This started as a response to the increasing global concern of climate change impacts. **Article 6** of the UNFCCC Convention seeks to reduce the impact of climate change by enabling society to be a part of the solution. Education and training are integral in enabling citizens' contributions to local and global efforts to meet the climate change challenge.SDG 4 target 7 provides that all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles by 2030. SDG 13.3 calls for improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. Article 12 of the Paris Agreement requirescountries to cooperate in taking measuresto enhance **climate** change education, training, public awareness, public participation and public access to information.

The NCCAP 2018-2022 is an implementation tool that sets out priority action areas to implement the various issues that have been raised by the initiatives by aligning strategic actions to the Sustainable Development Goals which all have an aspect of climate change to be addressed.

Climate Change Act, Section 21 calls for integration of climate change into the national education curriculum at all levels including the relevant policies.

Curriculum developers should develop curricula thatenables learners to

- Appreciate global and local policies and initiatives on climate change.
- Understand the need for negotiations and collaborationon matters of climate change
- Properly interpret and apply the policies.
- Appreciate the need for mainstreaming climate change policies in planning processes.

- Appreciate the key issues relevant for a future climate change scenarios.
- Appreciate our obligations to the international community

3.6 Research and Innovation

Research and Innovation are critical requirements for appropriate climate change responses in terms of mitigation and adaptation. The dissemination of accurate and reliable scientific information is needed to tackle the challenges posed by climate change while taking advantage of the opportunities that may arise. The national vision to transition to a low carbon climate resilientdevelopment pathway calls for enhanced use of science, technology and innovation (STI) to raise productivity and efficiency across all sectors of the economy.

Technological changes brought about by research and innovation are key in ensuring that climate change and its challenges are addressed without compromising economic growth. Mainstreaming research and innovation in curriculawill foster more innovative, productive and prosperous societies.

Curriculum developers should design curricula that;

- Emphasizes on innovations and evidence based decisions

- Provides opportunities for research on climate change including citizen science

- Expose learners to current technological advancements and innovations

- Provides for information and knowledge sharing

- Provides for technology development and transfer

- Promotes indigenous and local knowledge and technologies

CHAPTER4.0   MONITORING, EVALUATION AND REPORTING

The Ministry of Environment and Forestry in collaboration with theMinistry of Education will ensure that theseguidelines are implemented. The scope of this M&E will go to the level of the curriculum developers beyond which it will be subjected to the existing M&E mechanisms at the Ministry of Education and other implementing institutions. This is also in line with Section 21 of the Climate Change Act 2016. The ministry will facilitate Monitoring, Evaluation and Reporting frameworksupportedby;

- Developing and refining an annual monitoring and evaluation framework
- Developing measurable monitoring indicators
- Set achievable timelines through implementation and performance indicators.

This process is important as it will help check on progress made by curricula developers towards reaching its objectives and to guide further decision making processes. A baseline will be used here to check on whether various targets have been met and to what percentage. These targets will be based on a needs assessment done across all levels of education.

M&E will help provide;

- Information on how well the guidelines are being adopted, how they are performing and whether they are achieving their aims and objectives.
- Guidance on future intervention on the curricula.
- An important part of accountability for funding.

Evaluation process will help show whether the guidelines made any difference to the development of the curriculum outcome and seek to understand how and why the guidelines have worked so well. Evaluation will be done during curricula development and also while assessing the desired outcome.Monitoring may involve periodic surveys to ascertain success of the curricula in changing attitudes and mindsets towards climate change.

CHAPTER 5.0 IMPLEMENTATION FRAMEWORK

An elaborate M&E framework will be developed for each objective. Performance indicators will be established and monitored.

Guidelines	Responsible institution	Time frame (years)			Cost
		1 - 3	3 – 5	5 >	
Understanding climate change and its impact	MEF, MoE				
Knowledge, skills and competencies to respond to CC	MEF, MoE				
Efficient production and utilization of resources	Ministry of energy				
Whole institution approach	KEPSHA, CLE				
Research and innovation	CUE, KATTI				