

CLIMATE CHANGE LEARNING STRATEGY IN GHANA:

BACKGROUND REPORT



INSTITUTE OF GREEN GROWTH SOLUTIONS



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Climate Change Learning Strategy in Ghana: Background Report

By:

Institute of Green Growth Solutions

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List of Acronyms and Abbreviations

AAP	African Adaptation Programme
AAA	Accra Agenda for Action
ALP	Adaptation Learning Programme
ACPC	African Climate Policy Centre
AGI	Association of Ghana Industry
AfDB	African Development Bank
BRT	Bus Rapid Transit
CBA	Community Based Adaptation
CCA	Climate Change Adaptation
CC-DARE	Climate Change Adaptation and Development Programme
CCFG	Climate Change Finance in Ghana
CDM	Clean Development Mechanism
CDKN	Climate and Development Knowledge Network
CoP	Conference of Parties
CRDD	Curriculum Research and Development Division
CSIR	Council for Scientific and Industrial Research
CSOs	Civil Society Organisations
DANIDA	Danish International Development Agency
DFID	Department for International Development
DRR	Disaster Risk and Response
ECN	Energy Research Centre of the Netherlands
EE	Environmental Education
EFR	Ecological Fiscal Reform
EIA	Environmental Impact Assessment
ENAPT	Environmental Applications and Technology
EPA	Environmental Protection Agency
EWS	Early Warning System
FASDEP	Food and Agriculture Development Policy
FCPF	Forest Carbon Partnership Facility
FOAT	Functional Organisational Assessment Tool
GAEC	Ghana Atomic Energy Commission
GAPTE	Greater Accra Public Transport Executive
GCF	Green Climate Fund

GEF	Global Environment Facility
GES	Ghana Education Service
GHG	Green House Gas
GHS	Ghana Health Service
GMet	Ghana Meteorological Services Agency
GoG	Government of Ghana
GSGDA	Ghana Shared Growth Development Agenda
INC	Initial National Communication
INDCs	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
IIPAC	Innovative Insurance Products for Adaptation to Climate Change
JICA	Japan International Cooperation Agency
LCDS	Low Carbon Development Strategy
LCG	Low Carbon Growth
MDA	Ministries, Departments and Agencies
MDAs	Ministries, Departments and Agencies
MEST	Ministry of Environment, Science and Technology
MESTI	Ministry of Environment, Science, Technology, and Innovation
METASIP	Medium-Term Agriculture Sector Investment Plan
MLGRD	Ministry of Local Government and Rural Development
MLNR	Ministry of Lands and Natural Resources
MRV	Monitoring, Reporting, and Verification
MMDA	Metropolitan, Municipal and District Assemblies
MoEP	Ministry of Energy and Petroleum
MoF	Ministry of Finance
MoFA	Ministry of Food and Agriculture
MoH	Ministry of Health
MoRH	Ministry of Roads and Highways
MWRWH	Ministry of Water Resources, Works and Housing
NAB	National Accreditation Board
NADMO	National Disaster Management Organisation
NCCAS	National Climate Change Adaptation strategy
NCCE	National Commission for Civic Education

NCCSAP	Netherlands Climate Change Studies Assistance Programme
NCCC	National Climate Change Committee
NCCP	National Climate Change Policy
NCTE	National Council for Tertiary Education
NDPC	National Development Planning Commission
NEAP	National Environmental Action Plan
NEP	National Environment Policy
NGOs	Non-governmental Organizations
POTAG	Polytechnic Teachers Association of Ghana
REDD+	Reducing Emissions from Deforestation and Forest Degradation
R-PP	National REDD+ Preparation Proposal
SBI	Subsidiary Body of Implementation
SEA	Strategic Environmental Assessment
SD	Sustainable Development
SNC	Second National Communication
TCPD	Country Planning Department
TLM	Teaching and Learning Materials
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNU-INRA	The United Nations University Institute for Natural Resources in Africa
UTAG	University Teachers' Association
WASCAL	West African Science Service Centre on Climate Change and Adapted Land Use
WHO	World Health Organisation

Executive Summary

In response to the global call for more action to be taken by governments to address the negative impacts of climate change and the growth of climate science both globally and locally, the Government of Ghana (GoG) has taken various steps to mainstream climate change into the developmental agenda of the country. Ghana is a signatory to the UNFCCC and is represented at the annual Conference of Parties (CoP) meetings.

The government's resolve to mainstream climate change into development agenda is demonstrated through the Ghana Shared Growth and Development Agenda I & II (GSGDA 2010 -2017), which gives consideration to climate change in all its thematic areas. The GSGDA I & II acknowledges that climate change is a major challenge that has the ability not only to erode the country's development gains, but also hinder further growth and sustainable development.

In July 2014, the GoG launched the National Climate Change Policy (NCCP) to provide clearly defined pathways for dealing with the challenges of climate change and to identify the opportunities and benefits of a green economy. The underlying vision of the NCCP is ***"to ensure a climate resilient and climate compatible economy while achieving sustainable development through equitable low carbon economic growth for Ghana"*** and is the country's integrated response to climate change (Ghana National Climate Change Policy, 2014)

The government's resolve to mainstream climate change into development efforts is demonstrated through the Ghana Shared Growth and Development Agenda (GSGDA I & II) (2010-2017)

The National Environment Policy (NEP) which was launched alongside the NCCP has capacity building as one of its key cardinal points. The NEP acknowledges capacity building as a major step towards the realisation of a desired environment. By educating and building the capacity of all relevant stakeholders in sustainable environmental practices which in a broader sense, includes climate change capacity building, will play a critical role in achieving the objectives of the policy. Capacity building is also a key priority in other major national sectoral policies including the National Youth Policy, Ghana Educational Policy, Agriculture, energy, health, water resources, among others.

Other important national policy documents that acknowledge the effects of climate change on sustainable development include the Low Carbon Development Strategy and the National Climate Change Adaptation Strategy.

Ghana's development aspirations are vividly captured within the GSGDA I & II, both of which place a strong emphasis on building a climate resilient economy. The country's priority areas regarding climate change are also spelt out within the National Climate Change Policy, the National Climate Change Adaptation Policy, among others.

Furthermore, the country development priorities regarding climate change will be the starting point for the development of the country's Intended National Determined Contributions to be submitted ahead of the 21st Conference of Parties (CoP 21).

Given that both INDCs and the National Climate Change Learning Strategies are to be informed by the long term development framework of respective countries, there will be the need for a strong linkage between long term development objectives, the INDCs, and National Climate Change Learning Strategies.

Key steps have been taken towards climate change mainstreaming by several institutions such as the National Development Planning Commission (NDPC), Ministry of Science, Technology and Innovation (MESTI) and the Ministry of Finance and Economic Planning (MoF) not only at the national level, but also at the local level. Some of the major steps include;

Key steps have been taken towards climate change mainstreaming by several institutions such as the National Development Planning Commission (NDPC), Ministry of Environment, Science, Technology and Innovation, and the Ministry of Finance (MoF).

- Incorporating climate change into the 2011-2012 National Planning and Budgeting Guidelines by MoF and NDPC.
- Developing indicators on climate change for the District Functional Organisational Assessment Tool (FOAT)
- The NDPC and EPA have developed a guidebook for mainstreaming climate change and disaster risk reduction into District Medium Term Development Plans.
- Training of MMDAs on the use of the Guidebook for mainstreaming climate change into planning and budgeting.
- High level awareness creation programmes for Members of Parliament, Members of Council of State, Economic Management Team, Chief Directors of key Ministries, District Chief Executives and Regional Coordinating Directors on mainstreaming climate change and disaster risks management into planning and budgeting at the sector and district levels.
- Development of Policy briefs on climate change.
- A study on climate public expenditure and institutional review

National Climate Change Priority Areas:

- Agriculture and Food Security
- Disaster Preparedness and Response
- National Resource Management
- Equitable Social Development
- Energy, Industrial and Infrastructural Development

National priority areas in relation to climate change mainstreaming:

Ghana has identified five (5) priority areas within which there are ten (10) focus/programme areas. The table below identifies the various priority and focus areas.

Table 1: Climate Change Priority Areas and Focus Areas

Priority Area	Focus Areas
Agriculture and Food Security	<ul style="list-style-type: none">• Develop climate-resilient agriculture and food security systems
Disaster Preparedness and Response	<ul style="list-style-type: none">• Build climate-resilient infrastructure• Increase resilience of vulnerable Communities to climate-related Risks
National Resource Management	<ul style="list-style-type: none">• Increase Carbon Sinks• Improve management and resilience of Terrestrial, Aquatic and Marine Ecosystems
Equitable Social Development	<ul style="list-style-type: none">• Address impacts of climate change on human health• Minimise impacts of Climate Change on access to water and sanitation• Address gender issues in Climate Change• Address Climate Change and Migration
Energy, Industrial and Infrastructural Development	<ul style="list-style-type: none">• Minimise Greenhouse Gas Emissions

Source: National Climate Change Policy, 2013

Climate Change Education and Capacity Building

In the last two decades, Climate Change and Environmental Education (CCEE) and Education for Sustainable Development (ESD) have become major tools for protecting the environment and ensuring sustainable development (UNICEF 2013).

Capacity building has become pivotal to most international conventions such as the United Nations Framework Convention on Climate Change, especially among developing countries. Article 6 of the UNFCCC enjoins all parties' governments to develop and implement education and training programmes, including the strengthening of national institutions, training of scientific, technical and managerial personnel, as well as implementing public awareness programmes on climate change and its effects.

In the last two decades, Climate Change and Environmental Education (CCEE) and Education for Sustainable Development (ESD) have become major tools for protecting the environment and ensuring sustainable development.

Furthermore, at the 18th Conference of Parties (CoP 18) in Doha in 2012, Parties adopted the eight-year Doha work programme on Article 63. The Doha work programme requested the Subsidiary Body

of Implementation (SBI) to organise an annual in-session Dialogue on Article 6 of the Convention to enhance the objectives of Article 6. The Doha Work Programme recognises the “importance of taking a long-term, strategic and country-driven approach to education, training and skills development”, and invites Parties to “prepare a national strategy on Article 6 of the Convention”.

The United Nations Education, Scientific, and Cultural Organisation (UNESCO) has been the main UN body that has championed climate change education within the framework of the UN Decade of Education for Sustainable Development (DESD), with the objective of making climate change education a more central and visible part of the international response to climate change. The UNESCO programme is also targeted at helping young people appreciate the impact of global warming today and increase "climate literacy" This, the UNESCO hopes to achieve by strengthening the capacity of its member States to provide quality climate change education; encouraging innovative teaching approaches to integrate climate change education in school and by raising awareness about climate change as well as enhancing non-formal education programmes through media, networking and partnerships.

Some Past and On-Going Capacity Building Efforts in Ghana

A number of capacity building initiatives in climate change have either been carried out or are on-going. Some of the initiatives have taken place at global and regional levels while others are specific to Ghana. They include;

- Netherlands Climate Change Studies Assistance Programme (NCCSAP)
- Climate Change Adaptation and Development Programme Initiative (CC-DARE)
- Adaptation Learning Programme (ALP) for Africa Innovative
- Insurance Products for Adaptation to Climate Change (IIPAC) Integrating climate change into the management of priority health risks
- International Development Association Program Document For A Proposed Natural Resources And Environmental Governance First Development Policy Operation To Ghana
- Adaptation Learning Program (ALP)
- Climate Health Project
- Low Emission Capacity Building Program
- Green Climate Fund
- Capacity Building on Measurement, Reporting, and Verification (MRV) Domestic Architecture
- Africa Adaptation Program in Ghana
- Community Resilience Through Early Warning
- Technical Assistance For Sustainable National Greenhouse Gas Inventory Management Systems In West Africa (West Africa GHG Project)
- Ghana Technology Needs Assessment
- National Climate Change Adaptation Strategy
- Climate Change Education in Schools Programme (CCES, EPA)

Capacity Building Needs for Stakeholder Groups

Different stakeholders have different capacity building needs. To ensure adequate and proper capacity building for all stakeholders, it is necessary to perform a comprehensive need assessment for all stakeholders.

A number of steps have been taken to address national capacity gaps, but it is obvious that there are still immense capacity gaps that need to be addressed. There are challenges regarding institutional capacity, strengths, and interaction. Most recently, skilled climate scientists have been in great demand in response to the need for evidence based information for development planning both at the national and district levels.

The various stakeholder groups Identified within this report are;

- Policy makers / regulatory and enforcement institutions / local government practitioners
- Academia (All levels)
- Non-academic training Institutions
- Community;
 - Community Based Organisations / Religious Organisations / Chiefs and other Traditional rulers / Local people (farmers and fishermen)
- Business and Industry
- Media
- Non-Governmental Organisations / Civil Society Organisation
- Health Institutions and Professionals

*Capacity building needs assessment for the above-named stakeholder groups is discussed under **section 6** of this report.*

Improving Climate Change Learning in Ghana

There is the need to develop appropriate educational and public awareness programs on climate change and its effects and ensure that they are fully implemented. Based on the categories of individuals and groups, forms of learning and types of institution, specific strategic actions can be taken to improve learning on the issues of climate change while at the same time strengthening institutional capacities.

A National Climate Change Learning Strategy offers a systematic approach for planning a sustainable country-driven, and results oriented climate change educational programme. It enables countries to take stock of existing initiatives, identify gaps as well as prioritise proposed actions. A National Climate Change Learning Strategy will also ensure that all sections of the population acquire knowledge, skills, values and attitudes necessary to develop the needed responsible environmental behaviour that fosters environmentally positive changes in society.

Conclusion and Recommendations

The launch of Ghana's first climate change and environmental policies has initiated the process for a long term commitment from all the levels of support especially from political leadership to ensure the effective implementation of Ghana's climate change policy.

Ghana's strategic Plan for Environmental Education developed by the Environmental Protection Agency could be used as a model for increasing the capacity needs of all stakeholders in the country.

It must also be added that, the training intervention to address climate change training capacity gaps will need to be a comprehensive one in order to enable the country make progress in driving the climate change agenda. A combined package of well-funded and targeted short and long term training as well as strengthening the capacity of institutions that already train the citizenry on climate change is needed. Both a theoretical and practical study tours should constitute the training plan intervention in the short and long term perspective. Such a strategic approach to capacity building will contribute significantly towards the achievement of climate change outcomes.

In order to improve the capacity for climate change adaptation and mitigation, training of the citizenry need to be pursued with a new zeal and paradigm shift from the business as usual scenario.

The authors make the following recommendations for training and capacity building which are pillars in Ghana's climate change policy:

1. To address climate change knowledge and skill gaps at all level of national development
2. Develop a strategy to foster a systematic and country-driven process for determining comprehensive and focused training plans to enhance climate change learning and to strengthen national education and training systems which must be an integral part of Ghana's education requirements in order to mainstream and build capacity – The EERP module by UNICEF and other UN and international learning resources will provide critical help and insight
3. For professional staff in the civil service, funds must be mobilized to provide short courses and workshops to build their capacity at the civil service training centre or at Universities
4. Already existing educational programmes such as the Climate Change and Sustainable Development programme at the University of Ghana will need funds to provide courses such as climate modelling and GHGs monitoring to help further expand the frontiers of climate change education and capacity.
5. In the design of a climate change programme for training and capacity building, effort must be made to incorporate the relationship between climate change, land use, natural resources, waste management, energy, gender and health.
6. Stakeholders such as media and NGOs need to be trained at workshops, and short courses at higher education institutions on climate change to enable them understand the

concept of climate change and improve their reporting skills and therefore position them strategically in advocating the climate change agenda

7. The EPA (lead institution) must collaborate with other relevant institutions such as schools, NGOs media etc to develop climate change education, training and awareness action plans to improve climate change understanding and enhance adaptive capacity and awareness at district, regional and national level.
8. It is also recommended that climate change ambassadors be supported and their capacity developed at districts, regional and national levels in order to have role models at each sector of national development.
9. On a regular basis, refresher courses must be organized for decision makers so they are abreast with current situation with regards to climate change
10. The UNESCO Series on Journalism Education provides very important nuggets on how Journalists and by extension, media personnel can build their capacity to report on climate change. The resource is therefore recommended for training media personnel on climate change reporting.

Section 1: Introduction

Since the 1990s, climate change has increasingly come into sharp focus as one of the world's most threatening environmental issues. Poor communities and economies depending on climate sensitive resources such as agriculture are especially, vulnerable to climate change (IPCC, 2007).

Over the years, climate change has evolved from what was believed by many as the figment of the imagination of some scientists, to a real global threat to sustainable development and human existence. Series of research have been conducted on the effects of coal burning for development typically after the advent of industrialisation from the late 18th century. Scientists in the late 1950s predicted that carbon dioxide concentration in the atmosphere will rise by 25% in 2000 with radical effects on the climate. In June 1992, 154 Nations acknowledged the impact of warming climate on sustainable development and human existence at the Earth Summit in Rio and came up with the United Nations Framework Convention on Climate Change (UNFCCC) treaty.

Following the coming into force of the UNFCCC in 1994, the world has witnessed critical milestones towards galvanizing global response to dealing with climate change. Major among these milestones include the Kyoto Protocol in 1997, the Bali Road Map in 2007, the Copenhagen Accord in 2009, the Cancun Agreement in 2010, the Durban Platform for Enhanced Action accepted by the 17th Conference of Parties (CoP 17) meeting in 2011, the Doha Amendment to the Kyoto Protocol in 2012, the establishment of the Green Climate Fund, the Warsaw Framework for Reducing Emissions from Deforestation and Forest Degradation (REDD+) among other key negotiations agreed upon in 2013 generally referred to as the Warsaw Outcome, and most recently, the Lima call for Climate Action during the 20th Conference of Parties (CoP 20).

At CoP 19 in Warsaw in December 2013, Parties were invited to initiate or intensify domestic preparations for their intended nationally determined contributions (INDCs) [towards climate change adaption and mitigation] and to communicate them well in advance of CoP 21. Given the strong focus on climate change learning globally, it is expected that the INDCs to be submitted by parties will include deliberate and country-driven strategies for climate change learning and capacity building.

Section 2: The National Context

2.1: Climate Change Mainstreaming

Though Ghana's economy has grown considerably to a lower middle income status, sustaining this growth trajectory into the medium to long term is to a large extent, threatened by the effects of climate change. Ghana is even more vulnerable to the impact of climate change because key sectors of the country's economy including agriculture (which is estimated to provide employment directly and indirectly for about 70% of the population through fisheries, crop and animal farming etc), forestry, and energy production are all sensitive to alterations in climate.

The Government of Ghana (GoG) recognises the social and economic impacts, and the development challenge arising from climate change and as a result, shown commitment to mainstreaming climate change into key planning processes at the national, regional and local level (MEST, 2010). The Ghana Shared Growth and Development Agenda (GSGDA) (2010-2017) avidly demonstrates this commitment. Further to developing the GSGDA and other policy documents, the government through the Ministry of Finance (MoF), Environmental Protection Agency (EPA), and the National Development Planning Commission (NDPC), has taken a number of measures to reflect the climate change mainstreaming efforts in budget formulation, implementation, monitoring and evaluation in line with the medium term climate change objectives. These measures include;

- Incorporating climate change into the 2011-2012 National Planning and Budgeting Guidelines by MoF and NDPC. In line with this, MMDAs and MDAs were required to be guided by these two guidelines in the preparation of their annual sector plans.
- Development of indicators on climate change for the District FOAT - NDPC and MoF with the support of EPA has developed the Functional Organisational Assessment Tool (FOAT). This tool uses indicators, including indicators on climate change mitigation and adaptation to determine the amount of funds released to the districts. This has been mainstreamed into the national monitoring and evaluation plan to guide the implementation of the sector and district plans.
- The NDPC and EPA have developed a guidebook for mainstreaming climate change and disaster risk reduction into District Medium Term Development Plans.
- Training on the use of the Guidebook for climate change mainstreaming - MMDAs have been trained on the use of the Guidebook for mainstreaming climate change into planning and budgeting.
- High level awareness creation programmes for Members of Parliament, Members of Council of State, Economic Management Team, Chief Directors of key Ministries, District Chief Executives and Regional Coordinating Directors on mainstreaming climate change and disaster risks management into planning and budgeting at the sector and district levels.
- Development of Policy briefs on climate change – Policy briefs have been developed on various themes on climate change including development planning, agriculture, education, forestry, health, tourism, transport, human settlement disaster risk management, coastal

zone and resources, water resources, energy, private sector finance, public finance, opportunities, gender, indigenous knowledge, capacity and technology.

- A study on climate public expenditure and institutional review - The MoF is planning to undertake climate public expenditure and institutional review.

The MoF is also leading an Inter-Ministerial Working Group on Ecological Fiscal Reform (EFR) that seeks to modify taxes and public expenditure such that sustainable development, environmental protection, climate change and green economy principles are appropriately considered. Specifically, the reforms will lead to a shift in the tax base and burden away from conventional taxes, such as taxes on economic goods such as labour, investment and consumption to environmentally damaging activities, such as use of natural resource or pollution.

2.2: Policy Initiatives

2.2.1: The Ghana Shared Growth and Development Agenda

The Ghana Shared Growth and Development Agenda I & II both acknowledge climate change as a major challenge that has the potential not only to erode the little development gains, but also hinders further growth and sustainable development. Climate change affects livelihoods, and almost every aspect of society, from health and food supplies, to business and national economies¹.

The priorities of the Ghana Shared Growth and Development Agenda is core to the government's efforts to pursue sustainable and equitable economic growth which is in itself enshrined de jure through the provisions of the Directive Principles of State Policy (Article 36 (9)) of the 1992 Constitution of the Republic of Ghana.

2.2.2: National Climate Change Policy

In line with the GSGDA, the Ghana National Climate Change Policy (NCCP) was approved by cabinet in May 2013 and launched in July 2014 with the vision ***“to ensure a climate resilient and climate compatible economy while achieving sustainable development through equitable low carbon economic growth for Ghana”*** and is the country's integrated response to climate change (Ghana National Climate Change Policy, 2014). The policy was designed to provide clearly defined pathways for dealing with the challenges of climate change within the context of Ghana's sustainable socio-economic development, as well as identify opportunities and benefits of a green economy. Aside providing the general strategic direction and co-ordinating issues of climate change in Ghana, the policy has four thematic areas namely;

1. Energy and Infrastructure
2. Natural Resource Management
3. Agriculture and food security, and
4. Disaster preparedness and response

¹ UNESCO Series on Journalism Education. Climate Change in Africa: A Guidebook for Journalists, 2013

The identified objectives of the policy are;

1. Effective adaptation,
2. Social Development, and
3. Mitigation

The policy also identifies the significant development benefits that climate change related opportunities such as low carbon economic growth development for the country. Examples of such potential benefits are accessing international funding sources such as the Reducing Emissions from Deforestation and Forest Degradation (REDD+), the special Climate Change Fund; the Adaptation Fund; the Global Environment Facility; the Green Climate Fund among others. Other benefits that may be derived from mainstreaming climate change into development include the opportunities for new business models and innovations, new routes to sustainable development, and new and scientific ways for indigenous knowledge to have an impact in the quest for sustainable development.

2.2.3: National Environment Policy

Closely related to the NCCP is the National Environment Policy (NEP). The NEP acknowledges capacity building as a major step towards the realisation of a desired environment. By educating and building the capacity of all relevant stakeholders in sustainable environmental practices which in a broader sense, includes climate change capacity building, will play a critical role in achieving the objectives of the policy. Capacity building is also a key priority in other major national sectoral policies including the National Youth Policy, Ghana Educational Policy, Agriculture, energy, health, water resources.

Specifically, the NEP aims at:

- a. Improving the commitment to environmental objectives, policies and interventions;
- b. Controlling rapid population growth, promoting economic growth, reducing poverty, promoting good governance and strengthening institutional capacity, improving quality and flow of information;
- c. Creating an understanding of the nature and causes of environmental problems;
- d. Defining the national environmental agenda and linking it to economic growth, poverty reduction, legal and institutional capacity;
- e. Mainstreaming international relations into the national environmental agenda;
- f. Improving environmental quality monitoring programme to ensure that the appropriate mitigation measures are implemented;
- g. Taking appropriate measures to control pollution and the importation and use of potentially hazardous and toxic chemicals;
- h. Taking appropriate measures to protect sensitive ecosystems;

- i. Improving collaborations and coordination among MDAs and other key actors (National Environmental Policy).

One of the key principles of the NEP is capacity building and education. This principle exhorts every Ghanaian to have opportunity to develop and strengthen skills, competencies and abilities to effectively participate in the process of achieving the sustainable development goals. Environmental Education (EE) is very critical in addressing this concern. EE promotes attitudes and values that influence environmentally-ethical behaviour by developing understanding and skills. It enables people to participate as active and informed citizens who can contribute to the development of an ecologically-sustainable and socially – just society (National Environment Policy, MESTI, 2013)

2.2.4: Low Carbon Development Strategy

Further to the development of the National Climate Change Policy (NCCP), the Low Carbon Development Strategy (LCDS) has been developed to re-affirm Ghana's resolve to mainstream climate change into development efforts. The primary objective of the LCDS is to provide a framework that will ensure climate-resilient, equitable, low-emission economic growth and development as well as providing opportunities for Sustainable Development (SD) benefits and poverty reduction in a cost efficient manner that will ensure a vibrant climate compliant economic development that ensures both intra-generational and inter-generational equity for all.

The overall objective of the LCDS is to contribute to global climate change mitigation through the development of an economically efficient and comprehensive LCDS for Ghana together with a monitoring, reporting and verification system and an action plan.

The specific objectives include:

- Assess the current climate change mitigation policies/strategies and challenges;
- Provide a clear picture of the current situation with regards to major emission sources;
- Provide a clear picture of future emissions based on current situation (business as usual scenario);
- Identify, analyse and develop long-term mitigation scenarios based on cost efficiency and effectiveness, and on national development aspirations;
- Assess the potential barriers to implementing these strategies and recommendations for improvement;
- Develop institutional framework to support the implementation of the strategies;
- Develop action plans for the implementation of strategies in key sectors;
- Identify opportunities for appropriate financial and economic policy initiatives that will enhance implementation of the strategies.

2.2.5: National Climate Change Adaptation strategy

Ghana has also developed the National Climate Change Adaptation Strategy (NCCAS), which defines the country's strategic blueprint for adjusting Ghana's economy to expected climatic stimuli and their effects for the period 2010-2020. Towards achieving its primary objective which is **“to enhance**

Ghana's current and future development by strengthening its adaptive capacity with regard to climate change impacts and building the resilience of the society and ecosystems", the NCCAS has formulated some objectives and proposed some programmes geared towards minimizing vulnerability and increasing resilience to Climate Change impacts for the poor and vulnerable, and enhancing national capacity to adapt to climate change.

Specifically, the NCCAS aims to:

- Ensure a consistent, comprehensive and targeted approach to increasing climate resilience and decrease the vulnerability of the populace;
- Deepen the awareness and sensitisation of the general populace and of policy makers in particular about the critical role of adaptation in national development efforts;
- Position Ghana to draw funding for meeting her national adaptation needs;
- Strengthen international recognition to facilitate action;
- Facilitate the mainstreaming of climate change and disaster risk reduction into national development
- Stress the linkages between adaptation and mitigation activities by harmonising and creating synergy among different sectors.

2.2.6: Ghana National Youth Policy

The vision of the Ghana National youth Policy of 2010 is ***'empowering the youth to impact positively on national development'***. The policy acknowledges that the development and empowerment of the youth is imperative for the attainment of national developmental goals. It is, therefore, important to take account of the youth in the national developmental efforts. The policy also has environment as one of its focus areas, with the objective of improving the youth's knowledge on sustainable environmental practices, which in a broader context, includes climate change education and capacity building.

Other Initiatives towards climate change mainstreaming

Other initiatives to build capacity, and mitigate the effects of climate change include the following:

- The launch of the REDD-Readiness framework (UNESCO, 2013)
- National Appropriate Mitigation Actions (NAMA) under the Low Emissions Capacity Building Project^{2,3}

² See IISD Learning Centre. Developing Financeable NAMAs webinar series (<http://www.iisd.org/learning/courses/category.php?id=a8>)

³ Some NAMAs being currently implemented include:

- Promotion of Improved Cookstoves and Cooking fuels;

- Plans to build the largest solar power plant (155 megawatts) in Africa will be built in Ghana⁴ as the government of Ghana hopes to achieve its target of generation 10% of electricity production in Ghana from renewable energy sources under the United Nations Decade of Sustainable Energy for All (SE4All) which runs from 2014 to 2024
- The President Obama “Power Africa Initiative” which Ghana will be one of the initial beneficiaries
- Plans to build a new University in Ghana to focus on climate science which will also help address pertinent issues concerning the environment, food security and youth employment.⁵
- The launch of the UNESCO Series on Journalism Education (UNESCO, 2013)

2.3: The National Communications

The country’s Initial National Communication (INC) to the United Nations Framework Convention on Climate Change (UNFCCC) was published in May 2001, covering the period of 1990 to 1996. This publication centred on the formulation of climate change activities that were considered consistent with the then national development plan. The INC served as the foundation for the development of subsequent climate change initiatives in the country.

Ghana’s Second National Communication (SNC) to the UNFCCC (EPA, 2011) was published in September 2011. The SNC described policies and measures in the areas of mitigation and adaptation to climate change. The central theme of the SNC was the pursuance of harmonized and coordinated actions to reduce climate change impacts on the most vulnerable people, while continuing to advance national economic development (EPA, 2011). In this regard, the SNC sought to develop a Low Carbon Growth Strategy for the country, becoming the foundation for the National Climate Change Policy Framework (NCCPF), and subsequently, the National Climate Change Policy (NCCP). The NCCP identifies the need for a green economy transition that takes advantage of opportunities when addressing climate change whilst at the same time reducing its impact on affected communities, taking into account the various sectors’ development plans as well as the country’s development goals.

To meet Ghana’s obligations under Article 4, paragraph 1, and Article 12, paragraph 1 of the convention, Ghana has submitted the Third National Communications (TNC) to the UNFCCC. The main objective of the TNC was to prepare, update and communicate to the Conference of Parties, policies and measures Ghana has taken and intends to implement at the national and the regional level.

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- Promotion of biogas for private use and in public institutions like school and hospitals;
 - Integration of renewable energy systems into households and commercial activities, among other initiatives

⁴ See <http://tv3network.com/all-news/news/local/africa-s-largest-solar-power-plant-to-be-built-in-ghana.html>

⁵ See <http://citifmonline.com/2015/06/09/new-climate-change-university-will-help-solve-flooding-problem-mahama/#sthash.HEJLOc8i.dpuf>

2.4: National Priority Areas

Ghana has identified critical priority areas towards the development of “a climate resilient and compatible economy while achieving sustainable development through equitable low-carbon economic growth for Ghana” The NCCP identified five key policy areas and ten focus areas with a total indicative implementation budget of about US\$ 9.3 billion over the period of 2014 to 2020 (See Figure 1 on page 25) These priority areas are;

- i. Agriculture and Food Systems
- ii. Disaster Preparedness and Response
- iii. Natural Resource Management
- iv. Equitable Social Development to address
- v. Energy, Industrial, and Infrastructural Development

2.4.1: Agriculture and Food Systems

According to the Intergovernmental Panel on Climate Change (IPCC), by 2020, up to 250 million Africans are likely to suffer from food insecurity as a result of climate-driven crop failure, loss of livestock, and lack of water.⁶ Climate change and variability are continuously becoming a major constraint to the development of the food and agriculture sector (including fisheries) in Ghana. The impacts are mainly due to the increasing variability of rainfall resulting in recurrent and longer dry spells that are delaying and shortening growing seasons. In the area of fisheries development, increasing numbers of coastal communities continue to experience a reduction in available lands for agriculture due to sea erosion caused by rising sea levels.

Ghana’s agricultural sector and food production systems are largely based on exploitation of natural resources, with extensive crop and livestock production systems, rain-fed agriculture, hunting, and fishing from natural water bodies.⁷(MESTI, 2014)

The agriculture and food systems priority area has an indicative budget of US \$ 950 million with the focus of ***developing climate-resilient agriculture and food systems for all agro-ecological zones***

2.4.2: Disaster Preparedness and Response

Improving the country’s disaster preparedness and response has been identified as the second priority area in the effort to mainstream climate change into development effort. Infrastructure plays a critical role in building the resilience of a town or community to climatic events and climate change⁸. In Ghana climatic effects have potential impacts on infrastructure such as roads, dams, power distribution lines, homes, settlement, sea defence walls, and human settlements. The damaging impacts of climatic conditions on these infrastructural bases can potentially erode economic gains made in the country

⁶ See the UNEP Factsheet *Climate Change in Africa – what is at stake?*
(http://www.unep.org/roa/amcen/docs/AMCEN_Events/climate-change/2ndExtra_15Dec/FACT_SHEET_CC_Africa.pdf)

⁷ National Climate Change Policy

⁸ National Climate Change Policy

with associated loss of lives in the event of disasters. Total indicative budgetary allocation for this priority area is US\$ 386 million

The focus areas within this priority area are;

- Building climate-resilient infrastructure to protect inland and coastal communities, ecosystems, and services,
- Increase resilience of vulnerable communities to climate-related risks

2.4.3: Natural Resource Management

Ghana's natural resources are essential for providing important goods and services for social and economic development. The natural resources are currently experiencing continuous decline at alarming rate as a result of several factors cutting across various sectors of the Ghanaian economy. Forest and woodland resources provide diverse economic products and environmental services. As natural sinks and stores of carbon, these ecosystems contribute to the biological mitigation of greenhouse gases (GHGs) through sequestration. Improving ecosystems and environmental management practices has the potential of providing economic gains as well as the additional benefits of a greater agro-biodiversity and increased carbon sequestration. The natural resource management priority area has been allocated an indicative budget of US \$ 2,535 million and has two focus areas including;

- Increasing carbon sinks,
- Improving management and resilience of terrestrial, aquatic, and marine ecosystems.

2.4.4: Equitable Social Development

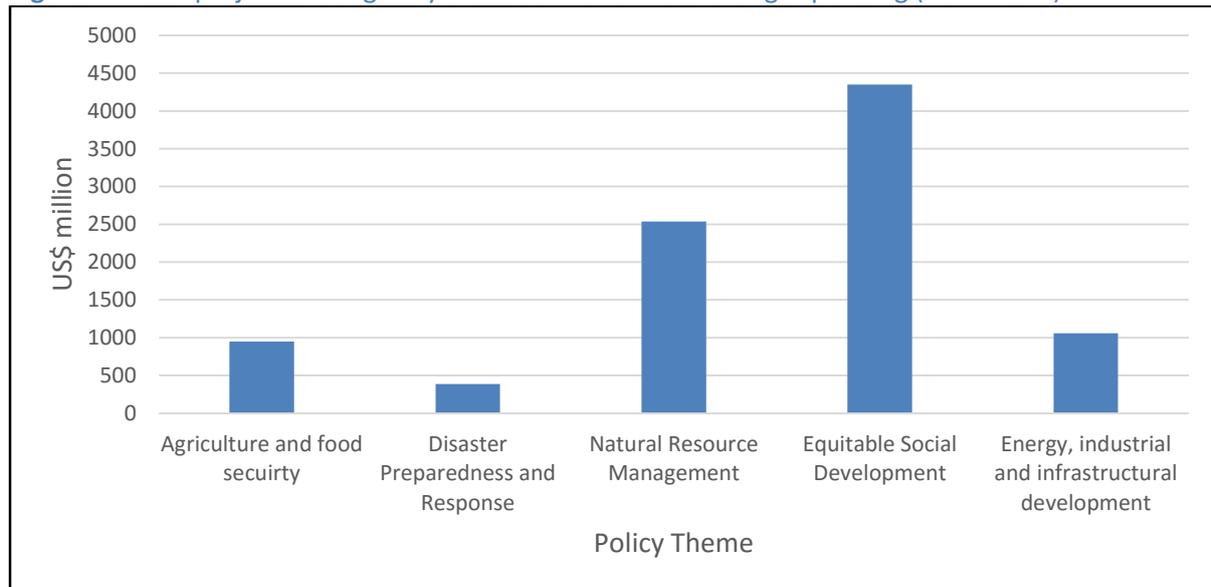
Climate change is influenced by social processes that relate to the way society evolves through time. There is ample evidence that human activities are a major driving factor of climate change. Over time, how effective the society in general is able to adapt to climate change as well as mitigate its effects is largely influenced by physical, technological, gender, and socio-economic factors. It is also a well-known fact that children, women, and marginalised groups are the worst affected by climate change. UNESCO succinctly puts it this way; "***Climate Change is a global phenomenon; as such, all people are vulnerable to its impacts. And yet, one major demographic in particular disproportionately bears the brunt of shifting weather patterns: women***" Climate change impacts public health through increased air pollution, increased water-borne diseases. Climate change also has gender, sanitation, and migration implications all of which affects the country's socio-economic development. Due to the forgoing, this priority area has received the highest proposed budgetary allocation of US \$ 4,348 million and has four focus areas which are;

- Address impacts of climate change on human health
- Minimise the impact of climate change on access to water and sanitation
- Address gender issues in climate change
- Address climate change and migration

2.4.5: Energy, Industrial, and Infrastructural Development

The energy, industrial and infrastructural development priority area has the single strategic focus of minimizing greenhouse gas emissions. The National Climate Change Policy acknowledges that the increasing greenhouse gas emissions from fuel consumption, for power and transport, agricultural soil, waste, burning of biomass, and other land use activities must be addressed in the nation’s near-to-medium term development agenda. This is even more important when considering that Ghana has transitioned from being a net carbon sink to a net carbon emitter. The total indicative budgetary allocation for this priority area is US \$ 1,057 million

Figure 1: NCCP projected budgetary allocation for climate change spending (2014-2020)



2.5: National Policy Initiatives, Priorities, INDCs and CC Learning

The Guidance Note for Developing a National Climate Change Learning Strategy (2013) emphasises that the long term development framework of countries informs and becomes the basis for the development of a national climate change learning strategy. Following this, the national climate change learning strategies to be developed by countries have to be further the county’s climate change development aspirations by strengthening human resources, climate change learning, and skills development in the respective countries.

Ghana’s development aspirations are vividly captured within the GSGDA I & II, which places a strong emphasis on building a climate resilient economy. The country’s priority areas regarding climate change are also spelt out within the National Climate Change Policy, the National Climate Change Adaptation Policy, among others.

Furthermore, the country development priorities regarding climate change will be the starting point for the development of the country’s Intended National Determined Contributions of Ghana which are supposed to be submitted ahead of the 21st Conference of Parties (CoP 21).

Given that both INDCs and the National Climate Change Learning Strategies are to be informed by the long term development framework of respective countries, there will be the need for a strong linkage between long term development objectives, the INDCs, and National Climate Change Learning Strategies.

Section 3: Capacity Building Needs

3.1: Introduction

To adequately address climate change learning within the context of Ghana’s development, consideration needs to be given to the country’s priority and focus areas spelt out within the climate change policy, as well as a comprehensive stakeholder needs assessment within the context of the national priority areas

3.2: Capacity building needs for focus areas

Table 2 below indicates some capacity building needs for the various focus areas as indicated within the National Climate Change Policy and Policy Framework.

Table 2: Some Capacity Building Needs for Priority Areas

Priority Area	Focus Area	Capacity Building Needs
Agriculture and Food Systems	Develop climate-resilient agriculture and food systems	<ul style="list-style-type: none"> • Improve and harmonise activities in climate-smart agriculture • Build and strengthen the capacity of extension officers in climate-smart agriculture • Promote awareness for climate change issues for fisher folks and farmers • Build capacity for community-level weather data collection, analysis, and dissemination for agricultural planning • Document and promote appropriate indigenous knowledge and best practices • Develop climate resilient cropping and livestock systems as well as crop varieties and livestock breeds tolerant to flooding, drought, and salinity • Promote diversified land use practices, including agro-forestry, dry land farming, urban/backyard vegetable production to reduce risk and increase the capacity of farmers to cope with floods • Design and implement programmes on fisheries management and disease control, which integrate climatic and hydrological parameters • Promote and support agricultural diversification (livestock – crop integration as well as the management practices) as a coping strategy and for income generation • Provide sustained support in the use of simple agronomic soil and water conservation measures (e.g., agro-forestry, crop rotation, tied ridging, mulching, contour earth mounds, vegetative barriers and improved fallow) • Promote appropriate technologies for small scale irrigation, water re-use and water harvesting (e.g., waste/water recycling), rainwater harvesting, etc.

Priority Area	Focus Area	Capacity Building Needs
		<ul style="list-style-type: none"> • Improve efficiency of farming practices through secure land tenure, effective pricing policies and access to credit. • Institute risk transfer schemes (e.g., insurance) against local supply changes, harvest failure or weather risk • Promote alternative livelihood systems to diversify incomes, such as beekeeping, poultry production, piggery, snail rearing, mushroom cultivation, sustainable aquaculture, etc., • Improve post-harvest capacity, e.g., storage and processing facilities and infrastructure • Build capacity for recycling and conversion of agricultural waste • Improve marketing policies that increase competitiveness for the domestic and international market • Increase support for agricultural research • Harmonise research activities in climate-smart agriculture
Disaster preparedness and response	Build climate-resilient infrastructure	<ul style="list-style-type: none"> • Improve technical and institutional capacity through research support and training • Research on appropriate infrastructure design standards that meet higher requirements against extreme weather-related natural hazard events • Improve hydro-meteorological observation networks to provide better climate data and information, and communicate early warning for natural hazards • Collect relevant data on coastal zone geomorphology, surface water flows and groundwater for modelling coastal flooding • Provide enabling policy environment to ensure climate resilience in urban planning, construction codes and management • Revise design standards, building codes and spatial planning to include climate change parameters • Construct proper storm drainage systems, riverbank protection, buffer zones, afforestation along embankments and other measures to reduce flooding • Construct channels, water collecting reservoirs and dams to contain floods and store water for the dry season • Encourage relocation of settlements and economic activities from climate-related disaster prone areas • Use ICT in monitoring climate events and providing an early warning system • Develop and implement strategies to change systems and make people adapted to climate change, e.g.,

Priority Area	Focus Area	Capacity Building Needs
		<p>harvesting rainwater and storage of grains can aid communities in adapting</p> <ul style="list-style-type: none"> • Ensure that rural communities have reliable access to markets, key services and lifeline facilities • Develop climate resilient standards for key coastal infrastructure and protection of coastal communities from storm surges, coastal flooding and sea level rise
	<p>Increase Resilience of Vulnerable Communities to Climate Related Risks</p>	<ul style="list-style-type: none"> • Establish various measures to protect livelihoods and assets of vulnerable communities from climate related risks, both at inland and coastal zones • Build local capacities to reduce risk and vulnerability • Document and improve community-based early warning systems for natural disasters and effective dissemination, especially at the local level in local languages • Enhance access to public information • Improve awareness and provide skills training to ensure preparedness on climate change and adaptation strategies • Avoid mal-adaptation by reversing trends that increase vulnerability • Strengthen the institutional framework for disaster risk response and management • Enhance institutional capacity of agencies in disaster risk management, especially the National Disaster Management Organisation (NADMO) • Improve technical capacity and facilities, as well as accessibility to communities, for rapid response to disasters and disaster management • Facilitate regular interactions between community members and the state and NGOs on emerging problems and best practice • Improve public adaptation strategies, including provision of wells, boreholes, road infrastructure, land tenure administration reform, education, etc • Support livelihood activities in rural and urban areas in order to improve output and income of vulnerable communities • Enhance awareness of financial instruments to protect investments and assets • Provide supporting social safety nets for communities • Increase investment in social services and infrastructure, which can also be supported by public-private partnership in service provision • Strengthen traditional social support systems
<p>Natural Resource Management</p>	<p>Increase Carbon Sinks</p>	<ul style="list-style-type: none"> • Strengthen institutional and technical capacity in natural resource management

Priority Area	Focus Area	Capacity Building Needs
		<ul style="list-style-type: none"> • Improve legislatives to effectively address land use rights and land tenure systems • Improve regulatory mechanisms to reduce illegal logging and chainsaw lumbering • Improve the efficiency of production, harvesting, conversion and use of wood fuels, e.g., improved efficiency in cook stoves, community/family woodlot programmes, charcoal producer associations, community land use and natural resource planning • Promote, through increased funding and opportunities, plantation development and management in off-reserve areas for private and public-private partnerships • Rehabilitate degraded natural ecosystems through enrichment planting in degraded forest reserves and off-reserve areas • Support agro-forestry programmes initiated to conserve trees in association with crops • Promote the establishment and consolidation of bio-reserves and buffers of forest
	<p>Improve Management and Resilience of Terrestrial and Aquatic Ecosystems</p>	<ul style="list-style-type: none"> • Promote effective spatial planning and land zoning, mapping and production of land resource management plans at all levels. • Support local, national and international policies that encourage management of terrestrial, aquatic and marine ecosystems • Improve mechanisms for fair and equitable sharing of natural resource benefits, including defining tenure rights, minimizing the encroachment of forest reserves and reduce conflict over permitted farms and communities • Support scientific research, including traditional and indigenous knowledge, monitoring, and collaboration with national and international institutions • Improve knowledge capacity for effective management of natural resources, for example, through sustained extension activities in soil and water conservation. • Apply technologies to provide information for detection and early warning systems for weather related hazards • Support awareness creation and dissemination programmes • Encourage and promote community based activities to improve land and water quality • Establish ecological networks or biological corridors to link fragmented forests, e.g., the establishment of Community Resources Management Areas (CREMAs) or linking up with existing CREMAs for synergy

Priority Area	Focus Area	Capacity Building Needs
		<ul style="list-style-type: none"> • Promote afforestation to enhance dry season flows in basins • Protect river courses, and de-sedimentation of reservoirs • Promote the use of biodiversity and ecosystem services as part of the adaptation strategy to climate change • Promote economic and social incentive measures for successful • natural resource management
Equitable Social Development	Address Impacts of Climate Change on Human Health	<ul style="list-style-type: none"> • Establish community health groups and development of capacity to identify health risks and facilitate access to services and decision-makers • Strengthen technical capacity to manage climate change related health risks • Strengthen disease surveillance systems through early warning • Improve on data sharing and develop health information management systems for diseases including climate sensitive diseases at all levels of the health delivery system • Improve partnership with relevant ministries and other stakeholders to improve access to potable water instead of direct dependence on natural water bodies and environmental sanitation Map disease incidence and identification of vulnerable groups for climate-sensitive diseases • Strengthen existing units within the health delivery system to manage climate related epidemics. • Collaborate with relevant stakeholders to improve nutrition through increased food processing capacity, food banks, nutrition education, and food storage and quality control. • Improve surveillance systems for existing and new disease risks and ensure health systems are geared up to meet future demands • Mainstream climate change health risks into decision-making at local and national health policy levels. • Identify, document and incorporate climate-relevant traditional knowledge into health delivery systems and practices • Develop structures to effectively manage and disseminate information on climate change health risk.
	Minimise Impacts of Climate Change on Access to Water and Sanitation	<ul style="list-style-type: none"> • Develop rainwater harvesting and increased use of shallow wells, dugouts and dams for water use • Make water accessible for domestic, agricultural, industrial, and commercial use and energy production • Recycle of water for domestic and industrial purposes

Priority Area	Focus Area	Capacity Building Needs
		<ul style="list-style-type: none"> • Develop efficient irrigation drainage systems to increase returns flows • Build capacity in water resources management in relevant sectors • Promote water supply and sanitation delivery practices that build resilience to climate change • Develop and introduce flood and drought monitoring and control systems • Improvement in social support system • Develop and implement environmental sanitation strategies to adapt to climate change • Strengthen District Assemblies to assume a central role in supporting community management of water and sanitation facilities • Reduce methane from landfills through waste reduction and recycling • Improve construction of hydropower schemes, irrigation systems and water supply infrastructure to improve efficiency • Implement drinking water and sanitation programmes in areas at risk from climate change (e.g., coastal areas, flood-and drought-prone areas) • Provide economic incentives to manage water resources including watersheds to furnish a sustainable and clean supply of water in addition to other ecosystem services and climate benefits • Improve in the status of environmental sanitation through strengthening of institutions and enforcement of laws
	<p>Address Gender Issues in Climate Change</p>	<ul style="list-style-type: none"> • Ensure the integration of gender equality principles in all social policies such as education, health, water and sanitation. • Generate gender-specific information including sex-disaggregated data for determining the gender impacts of climate change • Develop effective gender and climate change goals and gender sensitive indicators • Collaborate/Partner with CSOs, especially women's rights organisations and coalitions in climate change discussions and processes • Build the capacity of the relevant institutions to mainstream gender into climate change policy formulation, planning monitoring and evaluation • Prepare and implement gender and climate change mainstreaming strategic plans by institutions, which would provide a sound basis for evaluating the extent of gender mainstreaming

Priority Area	Focus Area	Capacity Building Needs
		<ul style="list-style-type: none"> • Identify and analyse gender-specific needs, impacts, protection and support measures related to climate change and variability such as floods, droughts and diseases • Promote gender equitable financing as a means of responding to the gender differential impacts of climate change. This will require establishing clear mechanisms for integrating a gender dimension in the design, implementation and monitoring of all climate funds • Increase the resilience of vulnerable groups including women and children, through the development of community-led adaptation, livelihood diversification, better access to basic services and social protection (safety nets, insurance) and scaling up • Integrated biomass strategies for food, fuel, fodder, and other basic needs including income generation • Promote effective and equal participation of men and women in climate change policy and decision-making processes • Strengthen the implementation of gender responsiveness in disaster risk management
	Address Climate Change and Migration	<ul style="list-style-type: none"> • Promote vocational training - especially for youth, in places with high in-migration potential migrants • Invest in agriculture in vulnerable areas such as developing crops and livestock that are pest and drought resistant, early yielding and culturally acceptable and irrigation, to help curb the rural-urban migration • Facilitate movement between source and destination areas through improved transport systems • Facilitate flows of remittances and goods and services between source and destination areas • Target social transfers and safety nets; including migrants in the social safety nets • Improve access to microcredit among migrants • Promote alternative livelihood programmes to develop skills among rural dwellers • Facilitate the proper utilization of rural and peri-urban lands by improving land use and land management schemes (move to natural resources) • Provide social protection for immigrants • Increase accessibility to quality health care for in-migrants • Mainstream migration into national development frameworks • Establish a national institution for the management of migration for development • Enforce rules and regulations of housing and sanitation

Priority Area	Focus Area	Capacity Building Needs
Energy, Industrial and Infrastructural Development	Minimize Greenhouse Gas Emissions	<ul style="list-style-type: none"> • Improve technical capacities, data collection and documentation systems for GHG emissions inventories and reporting • Improve institutional arrangements and existing national GHG system for data collection, data sharing and archiving in appropriate quality and format. • Support research, development and transfer of low emission technology such as natural gas combined cycle, natural gas distribution system, and mini and small hydro. • Promote energy efficiency and management activities that include new and innovative energy efficiency methodologies and techniques in various sectors, especially power generation, oil and gas, transport, biomass, industry, and waste • Promote the use of cleaner and more efficient energy sources and production methods that minimize resulting emissions and pollution • Create an enabling environment, including incentives and financing mechanisms, to encourage and support the use of renewable sources of energy. • Establish effective mechanisms for reducing volume of waste, and controlled and safe disposal of unavoidable wastes • Establish sustainable recycling and waste management technologies that generate energy (e.g., biomass energy, biogas, methane, etc.) and reduce emissions from solid and liquid waste, especially in urban areas. • Support public awareness of efficient use of energy and of renewable energy sources • Establish efficient infrastructures and mechanisms for processing and use of by-products from oil fields to prevent gas flaring
Energy, Industrial and Infrastructural Development	Minimise Greenhouse gas emissions	<ul style="list-style-type: none"> • Fuel for industrial and domestic use • Assist the private sector by way of incentives , and financial and technical support • Increase research and development on clean energy sources • Improve national greenhouse gas inventory mechanisms • Strengthen measures to reduce greenhouse gas emissions • Regular training for business leaders to appreciate the impact of climate change on their business

Source: National Climate Change Policy, 2013

3.3: Stakeholder Needs Assessment

The role of stakeholders will be critical for the sustainability and success of the climate change education programme. The competency level of the designated learning institutions on the issues of climate change needs to be developed and constantly upgraded to provide better training and awareness creation. Identifying all necessary stakeholders is therefore very important first step. This will play a key role in addressing both technical and financial capacity gaps of implementing institutions and the learning needs of the various other beneficiary groups. These stakeholders will include all departments, institutions, and organisations involved in policy making, education and community engagement. These are grouped under:

- The school/academic system includes all three levels of the educational system primary secondary and tertiary.
- Non-academic National Training Institutions
- Business and industry includes businesses, parliamentarians, Chief Executives Officers, Heads of Department, regulatory and enforcement agencies.
- Community Includes Community Based Organisations, Religious Organisations, Chiefs and Traditional Rulers, and locals
- The Media includes print and electronic.
- Non-Governmental Organisations

Table 3: Stakeholder Needs Assessment

Stakeholder Group	Capacity Building Need Assessment
Policy makers / regulatory and enforcement institutions / local government practitioners	<ul style="list-style-type: none"> • Training on the effects of climate change on development and critical issues to consider in factoring climate change into development effort • Setting up of climate change units • Climate negotiation skills and resource mobilisation training • The need for multi-disciplinary approach to research on climate change • Availability of up to date and reliable data to inform decision making, strategy, planning, and implementation • Strong internal systems and incentives to retain institutional memory and continuity • Research information on what works for local people and is informed by their views and, if possible, participatory • Basic information and resources on the relationship between climate change and sustainable development in all sectors of the economy • A more scientific means of tapping and analysing, and documenting indigenous knowledge on how to mitigate adverse climate impacts • Access to funds to support climate change initiatives • Institution of workable and appropriate MRV systems
Academia (All levels)	<ul style="list-style-type: none"> • Mainstream climate change into academic curricular • Funding to support research

Stakeholder Group	Capacity Building Need Assessment
	<ul style="list-style-type: none"> • Structure relevant course content by identifying thematic areas • Regular in-service training for managers of educational system, lecturers/teachers • Availability of up to date and reliable data for research • Development of multi-sectoral, multi-stakeholder approach to research • Training on new and emerging methods and concepts of climate change learning for education planners and practitioners
National Training Institutions (non-academic)	<ul style="list-style-type: none"> • Assess to technical training materials to enhance capacity of trainers • Continuous access to funds for training and education
<p>Community</p> <ul style="list-style-type: none"> • Community Based Organisations / Religious Organisations / Chiefs and other Traditional rulers / Local people (farmers and fishermen) 	<ul style="list-style-type: none"> • Translation of complex climate science into simple and easy-to-understand messages that will resonate with the wider public. • Access to training especially for women • Involvement of the local people in climate change initiatives • Effective and adequate channel for sharing information on climate change • Appropriate and up-to-date early warning systems that incorporates indigenous knowledge • Adequate information on more effective land use mechanisms that mitigates the adverse effects of climate change • Basic and easy-to-understand information on climate-smart farming methods • Climate resilient infrastructure • Improved drainage systems • Information and training on techniques and implementation of agroforestry • Indexed-linked insurance schemes that compensate farmers and pastoralists when certain climatic events occur.
Media	<ul style="list-style-type: none"> • Training media personnel on environmental reporting especially climate change issues • Information workshop on the decisions of the Conferences of the Parties and other key climate change agreements and milestones both at the international level and national levels • Access to critical information on climate change
Business and Industry	<ul style="list-style-type: none"> • Information on how climate change affects business and profit • Capacity enhancement training for business leaders • Information on climate change related business opportunities

Stakeholder Group	Capacity Building Need Assessment
	<ul style="list-style-type: none"> • Incentives to attract the private sector to finance climate change related activities, initiatives, and business opportunities • Research into and promotion of climate-smart energy solutions
Non-Governmental Organisations / Civil Society Organisation	<ul style="list-style-type: none"> • Continuous training on up-to-date trends in climate change • Training and capacity building • Development and exchange of educational materials and equipment for public awareness of Climate Change and its effects • Development of more effective advocacy techniques at the national and local levels
Health Institutions and Professionals	<ul style="list-style-type: none"> • Access to funds for research into climate related health risks • Training on the effects of climate change on health

Section 4: Past and On-going Initiatives

4.1: Introduction

Attempts to mainstream climate change into development in Ghana dates back to about twenty (20) years. The focus at the time was on adaptation and low carbon growth and has since, attracted a number of climate change related initiatives.

Over the years, Ghana has hosted numerous climate change related activities, initiated by international donors or research organisations, or by representatives of the Ghanaian government, academia or civil society (ECN, 2011). However, many of these initiatives have been relatively small-scale, and coordination across sectors, ministries or regions has often been lacking, according to an initiatives mapping report by the Energy Research Centre of the Netherlands (ECN) and funded by the Climate and Development Knowledge Network (CDKN) in 2011.

4.2: Initiatives

As already emphasised, Ghana has attracted various climate change related initiatives from the 1990s. Table 3 presents some of the major initiatives in the country.

Table 4: Climate Change Related Initiatives

Initiatives	Goal(s) / Objective(s)
Netherlands Climate Change Studies Assistance Programme (NCCSAP)	<ul style="list-style-type: none"> a) Raise awareness among decision-makers about climate change impacts and their management. b) Create a policy framework for climate resilient and low carbon economic growth that is compatible with, and integrated into, national development plans and budgeting processes. c) Provide a mechanism for implementing and financing the policy framework. d) Create the foundations for the development of detailed sector specific implementation plans. e) Link and harmonise existing climate change initiatives and opportunities.
Climate Change Adaptation and Development Programme Initiative (CC-DARE)	<ul style="list-style-type: none"> a) Provide timely technical and financial support on demand-driven basis to countries in Sub-Saharan Africa and Small Island Developing States for flexible and targeted actions to remove barriers and create opportunities for integrating climate change adaptation into national development planning and decision-making frameworks. b) Complement and strengthen on-going and planned climate change adaptation and risk management activities using quick and tailored support.⁹
Adaptation Learning Programme (ALP) for Africa	<ul style="list-style-type: none"> a) Increase the capacity of vulnerable households in sub-Saharan Africa to adapt to climate change, focusing on communities in two districts in Ghana,

⁹ See

<http://www.unep.org/climatechange/adaptation/KnowledgeandPolicy/CCDARE/tabid/29582/Default.aspx>

Initiatives	Goal(s) / Objective(s)
	<ul style="list-style-type: none"> b) Develop innovative approaches to community based adaptation (CBA), compile best practices, and empower local communities to have a voice in decision making on adaptation. c) Influence adaptation policies on all levels with a particular emphasis on gender equality and diversity
Innovative Insurance Products for Adaptation to Climate Change' (IIPAC)	The IIPAC was developed to enable the insurance sector in Ghana to offer innovative and economically sustainable insurance products against the financial risks caused by extreme weather events and variable temperatures and precipitation
'Integrating climate change into the management of priority health risks'	develop and implement a national strategy to streamline climate change risks into health sector policies and programmes
International Development Association Program Document for a Proposed Natural Resources and Environmental Governance First Development Policy Operation to Ghana	<ul style="list-style-type: none"> a) Ensure predictable and sustainable financing of the forest and wildlife sectors and effective forest law enforcement; b) Improve mining sector revenue collection, management, and transparency; c) Address social issues in forest and mining communities; and d) Integrate environmental considerations across sectors supporting growth through Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), and an inter-sectoral climate change strategy.
Adaptation Learning Program (ALP)	<ul style="list-style-type: none"> a) Develop and apply innovative approaches to Community-Based Adaptation (CBA) to generate best practice models; b) Empower local communities and civil society organisations to have a voice in decision making on adaptation; c) Promotes best practice models for CBA among adaptation practitioners; and (d) Influencing national, regional and international adaptation policies and plans
Climate Health Project	To identify, implement, monitor, and evaluate adaptation to reduce current and likely future of malaria, diarrheal diseases, meningococcal meningitis and other opportune diseases in Ghana
Low Emission Capacity Building Program	Build capacities to design and implement Low Emission Development Strategies and National Mitigation in the public and/or private sectors
Green Climate Fund	To promote "the paradigm shift towards low-emissions and climate-resilient development pathways" in the context of sustainable development
Capacity Building On Measurement, Reporting And Verification (MRV) Domestic Architecture	<ul style="list-style-type: none"> (a) All participants/sectors will have a common understanding of the purpose, principles and practice of MRV applied to emissions, mitigation actions and climate support. (b) All participants will understand the existing MRV architecture, roles and responsibilities for organizations and areas for improvement will be agreed. (c) Ghana's planned activities and timelines for MRV related activities will be reviewed in light of the major tasks needed to operationalize an MRV system. This will ensure all aspects of the MRV system are covered using a comprehensive approach, and

Initiatives	Goal(s) / Objective(s)
	all participants will understand what actions they need to participate in, to operationalize the MRV system.
Africa Adaptation Program In Ghana	<ul style="list-style-type: none"> a) Capacity for long-term planning to manage both existing and future risk associated with climate change are enhanced b) Leadership and institutional framework to manage climate change risks and opportunities in an integrated manner at the local and national levels are strengthened c) Policies and measures that are durable and can withstand impacts are implemented for disaster early warning systems in Ghana d) Financing opportunities for adaptation at the regional, national, sub-national, and local levels are expanded e) Knowledge management systems and information sharing across all levels are built and widely disseminated
Capacity Building On Measurement, Reporting And Verification (MRV) Domestic Architecture	<ul style="list-style-type: none"> a) All participants/sectors will have a common understanding of the purpose, principles and practice of MRV applied to emissions, mitigation actions and climate support. b) All participants will understand the existing MRV architecture, roles and responsibilities for organizations and areas for improvement will be agreed. c) Ghana's planned activities and timelines for MRV related activities will be reviewed in light of the major tasks needed to operationalize an MRV system. This will ensure all aspects of the MRV system are covered using a comprehensive approach, and all participants will understand what actions they need to participate in, to operationalize the MRV system.
Africa Adaptation Program In Ghana	<ul style="list-style-type: none"> a) Capacity for long-term planning to manage both existing and future risk associated with climate change are enhanced b) Leadership and institutional framework to manage climate change risks and opportunities in an integrated manner at the local and national levels are strengthened c) Policies and measures that are durable and can withstand impacts are implemented for disaster early warning systems in Ghana d) Financing opportunities for adaptation at the regional, national, sub-national, and local levels are expanded e) Knowledge management systems and information sharing across all levels are built and widely disseminated

Initiatives	Goal(s) / Objective(s)
Community Resilience Through Early Warning	To reduce disaster risks through better understanding hazard risks, reducing vulnerability to hazards, and enhancing capacities for disaster risk reduction
Technical assistance for Sustainable National Greenhouse Gas Inventory Management Systems in West Africa (West Africa GHG Project)	<ul style="list-style-type: none"> a) Setting up national systems for preparing national GHG inventories: institutional, legal and procedural b) Enhancing the technical capacity of national experts involved in national GHG inventory for NCs and BURs, especially for the energy, agriculture and forestry sectors c) Improving the quality of national GHG inventory in energy, agriculture and forestry considering; - National circumstances - Reporting requirements - IPCC principles
Ghana Technology Needs Assessment	<ul style="list-style-type: none"> a) Identify and prioritize through country-driven participatory processes, technologies that can contribute to adaptation goals of the participant countries, while meeting their national sustainable development goals and priorities; b) Identify barriers hindering the acquisition, deployment, and diffusion of prioritized technologies; c) Develop Technology Action Plans (TAP) specifying activities and enabling frameworks to overcome barriers and facilitate the transfer, adoption and diffusion of selected technologies in the participant countries.
National Climate Change Adaptation Strategy	Enhance Ghana's current and future development by strengthening its adaptive capacity to climate change

Source: Third National Communication, 2015; ECN, 2011

4.3: Existing Climate Change Related Education in Ghana

There are a number of climate change related educational efforts targeted at the formal and informal segments of the society. Most of these educational programs do not only focus on increasing public awareness on climate change, but also place emphasis on behavioural change and community action.

Formal environmental education focuses on the review of school curriculum to include climate change at levels of the educational system. In most of the public tertiary institutions, climate change and related subjects have either been integrated into existing courses or special graduate courses have been designed.

Section 5: Institutional Arrangements

5.1: National Climate Change Committee of Ghana

A National Climate Change Committee (NCCC) was established by the President in 2009 and is hosted by the Ministry of Environment, Science, Technology, and Innovation (MESTI). The committee is also made up of representatives of various stakeholders including Ministries, Departments and Agencies (MDAs), Parliamentarians, Civil Society Organisations (CSOs), research institutions, the private sector and development partners. The committee's mandate is;

- Give policy direction on climate change;
- Coordinate activities leading to the effective functioning of the policy; and
- Review related policies and programmes^{10,11}

5.2: Ministry of Environment, Science, Technology and Innovation

The Ministry of Environment, Science, Technology and Innovation (MESTI) has undergone restructuring in order to respond to the need for the integration of science, technology and innovation into national development policies (MESI, 2009). The ministry's mandate is to;

- Oversee the protection of the environment through policy formulation,
- Set standards and regulating activities regarding the application of science and technology,
- Plan urban and rural areas, and coordinate and supervise sustainable development activities.

MESTI operates through its key agencies which are; the Environmental Protection Agency (EPA); the Council for Scientific and Industrial Research (CSIR); the Ghana Atomic Energy Commission (GAEC); and the Town and Country Planning Department (TCPD). It is the lead institution for climate change activities in Ghana, serving as the Designated National Authority for the Clean Development Mechanism (CDM) under the Kyoto Protocol through the EPA (Climate Change Finance in Ghana (CCFG), 2015).

5.3: The Environmental Protection Agency (EPA)

The EPA has been charged with the responsibility of coordinating the implementation of technical activities on climate change through its **Energy and Climate Change Unit**. This unit serves as the technical hub for climate change as well as the link for international cooperation programmes. This unit also doubles as the focal points for the UNFCCC, the IPCC, Education, Training and Public Awareness and coordinates the preparation of national communications report to the UNFCCC (Benefoh and Nelson, 2012). It also acts as the focal point for the implementation of climate change related policies and programmes. This encompasses the coordination of activities of working groups and climate change study teams (MESTI, 2013).

¹⁰ Key informant interview with the Head of Climate Change and Sustainable Development at MESTI (01/03/2015)

¹¹ MESTI (2013)

5.4: Ministry of Finance

The Ministry of Finance (MoF) created the Natural Resources, Environment and Climate Change Unit under the Real Sector Division in 2010 to oversee, coordinate and manage the financing of, and support to natural resources and climate change activities¹². Through this unit, the MoF is mandated to coordinate all support (from both domestic and international sources) to climate change related activities in Ghana in a bid to avoid potential overlaps and duplication of efforts.

5.5: National Development Planning Commission

The National Development Planning Commission (NDPC), as the national institution at the major institution responsible for development planning, provides support for the institutional setup involved in climate change activities in Ghana. The NDPC through collaboration with MESTI, EPA and MoF, has ensured that the medium-term development policy framework (the Ghana Shared Growth and Development Agenda I & II (2010 – 2017) has climate change mainstreamed into all its thematic areas.

The NDPC has also translated climate change issues into planning guidelines and subsequently trained the Metropolitan, Municipal and District Assemblies (MMDAs) in relation to approaches to be used to mainstream climate change issues into local development plans (MESTI, 2013).

The African Adaptation Programme (AAP) at the EPA has developed an indicator (Box 3.1) through the collaborative effort of the NDPC and the Fiscal Decentralisation Unit at MoF for climate change in 2011. The indicator was subsequently been incorporated into the District Functional Organisational Assessment Tool (FOAT). FOAT (Box 3.2) is an assessment tool used to determine the amount of funds released to each District (CCFG, 2015). The commission also carries out monitoring activities (in collaboration with all sector MDAs) by overseeing the mainstreaming of indicators, including those for climate change, into the national monitoring and evaluation plan to guide implementation.

Box 3.1: Evidence of climate change indicator in the Functional Operational Assessment Tool (FOAT) and budget guidelines

The budget guidelines provided by MoF contain one reference to ‘climate change.’ In 2014–16, a new Local Climate Adaptation Living Facility (LoCAL) will be piloted to support activities within climate change in 3 MMDAs—Efutu Municipal, Fanteakwa District and Ada East District. The funds should be budgeted for taking into account the investment menu for LoCAL and linked to the DDF Operational Manual.

In the FOAT section ‘planning system’, there is an indicator for ‘climate change interventions’. The FOAT guidelines state ‘if 5% or more of the programme and/or physical projects in the Annual Action Plan focus specifically on climate change and disaster risk reduction (CC/DRR) issues, score 1, if not score 0’. The entire planning system section is valued at 18 points for the FOAT assessors.

Source: Savo et al, 2014 (p.10)

¹² Key informant interview with personnel at the Climate Change Unit at MoF (05/3/2015).

Box 3.2: Objectives of the Functional Operational Assessment Tool (FOAT)

- To verify the compliance of MMDAs with existing provisions in laws, regulations and national binding guidelines
- To inform the District Development Facility (DDF) allocation to a specific MMDA
- To identify the capacity building needs of MMDAs through identification of the major functional and organisational gaps
- To harmonise the current disjointed approaches to performance assessment.

Source: Ministry of Local Government and Rural Development, 2009

5.6: Ministry of Local Government and Rural Development

The Ministry of Local Government and Rural Development (MLGRD) has been charged with the mandate to promote the establishment and development of a decentralised government system, ensuring good governance and balanced rural development. With regard to climate change and environment, the MLGRD, with support from the NDPC, has the potential to play an important role in the mainstreaming processes of climate change into local-level development policies. The MLGRD contributed to the formulation of the NCCP.

5.7: Ministry of Health

The Ministry of Health (MoH) is the ministry in charge of ensuring a healthy and productive population nationwide (MOH, 2014). On climate change, the MoH provides support to integrate climate change into the management of priority health risks in Ghana, in harmony with national health development priorities¹³. Several major diseases are believed to be exacerbated by climate change, particularly malaria, diarrhoeal diseases, meningococcal meningitis and infectious respiratory diseases (Climate Change - Health Project)

5.8: Ministry of Water Resources, Works and Housing

The Ministry of Water Resources, Works and Housing (MWRWH) has the responsibility of overseeing the development of Ghana's infrastructure in relation to public works, housing, water supply and sanitation, and hydrology¹⁴. The ministry's mandates are strongly related to climate change and environmental management. Through its agencies (the Departments of Hydrology, Public Works, and Rural Housing) the MWRWH carries out climate response measures for coastal protection and drainage works (CCFG, 2015)

¹³ MESTI (2013)

¹⁴ MESTI (2013)

5.9: Ministry of Food and Agriculture

The Ministry of Food and Agriculture (MoFA) is responsible for all food security and agricultural related activities in the country. Currently, MoFA is spearheading the implementation of the national Food and Agriculture Development Policy (FASDEP II) including its investment plan, the Medium-Term Agriculture Sector Investment Plan (METASIP) which is scheduled to end this year. MoFA is promoting and ensuring capacity building of extension officers at the regional and district levels to enable them to mainstream climate change through their extension activities with farmers.

5.10: Ministry of Energy and Petroleum

The Ministry of Energy and Petroleum (MoEP) is Ghana's public institution charged with formulating, monitoring and evaluating energy related policies. It does this in conjunction with the Ghana Energy Commission and the Public Utility Regulatory Commission. The activities of this ministry to a large extent relates to climate effects. With respect to this, MoEP developed an Energy Policy Document in 2010 with the aim of contributing to climate change mitigation measures and initiatives to promote clean energy with less use of wood fuel and charcoal to safeguard the nation's forests that are important carbon sinks. The MoEP is also represented on the National Climate Change Committee (NCCC).

5.11: Ministry of Lands and Natural Resources

The Ministry of Lands and Natural Resources (MLNR) is mandated to oversee the management of Ghana's land, forest, wildlife and mineral resources. It works in conjunction with the Forestry Commission and Forestry Research Institute of Ghana in the execution of its activities. The MLNR is represented on the NCCC and has also been contributing to finding lasting solutions to climate change issues since the 1990s. The MLNR is the lead national entity responsible for the oversight and direction of 'Reducing Emissions from Deforestation and Forest Degradation (REDD+) activities in Ghana. Hosted by the Forestry Commission, the REDD+ Secretariat serves as the secretariat for the National REDD+ Working Group and coordinates the implementation of REDD+ readiness activities, as outlined in the National REDD+ Preparation Proposal (R-PP), with support provided by the Forest Carbon Partnership Facility (FCPF) of the World Bank (MESTI, 2013).

5.12: Ghana Meteorological Services Agency

Set up in 2004 under the Ministry of Communications, the Ghana Meteorological Services Agency (GMet) provides information/weather services through the collection, processing, storage and dissemination of meteorological data to end users. This plays a vital role in the day-to-day activities of both individuals and institutions (with regard to climate change) since it provides information necessary for enhancing and ensuring proper climate change adaptation measures.

5.13: Ministry of Roads and Highways

The Ministry of Roads and Highways (MoRH) is charged with the provision and maintenance of an integrated, cost-effective and sustainable road transport network. The ministry is currently supervising the implementation of the Bus Rapid Transit (BRT) system within Accra (Box 3.3). When successfully implemented, the BRT system will lead to a more environmentally friendly and sustainable means of transport which will help address the heavy vehicular traffic in the city, and thereby reducing the volume/amount of transport-related greenhouse gas emissions.

Box 3.3 Bus Rapid Transit System in Accra

The first phase of the Bus Rapid Transit (BRT) system in Accra will commence in December 2015, on a pilot basis with 87 buses to help ease traffic in the capital. The BRT is a system aimed at reducing traffic congestion on the roads, reduce air pollution and help increase productive hours in the Metropolis. This was revealed by The Mayor of Accra Metropolis, Dr. Alfred Oko Vanderpuije who is also the chairman of The Greater Accra Passenger Transport Executive (GAPTE), a transport regulatory body responsible for planning and regulation of passenger transportation in the Greater Accra Metropolitan Area (GAMA), when he inspected the three terminals earmarked for the piloting of the first phase of the project.

The corridors, which fall under the first phase, are Amasaman to the Central Business District (CBD), Ofankor to CBD, and Achimota to CBD. The terminals would have a holding bay where buses will be kept, a maintenance centre, a fuel depot for fuelling the buses, a ticketing centre, administration, a passenger waiting area and a washing bay where water to wash the buses would be recycled to avoid waste. This initiative is the first of its kind in the country. There will also be a parking space with adequate security for those who patronize the BRT to park their vehicles and join the buses to their various destinations and later come back for them.

Source: Accra Metropolitan Assembly (2014)

5.14: Non-State Actors involvement in Climate Change

Over the years, Non-governmental Organizations (NGOs) and Civil Society Organizations (CSOs) have been involved extensively in climate change activities in Ghana. This is evident through the level and nature of climate change initiatives at the community level; climate change policy advocacy at the national and international levels; education and research projects/programmes; and the promotion of community level consultation and participation in fostering project/programme success.

Some of the very notable NGOs and CSOs in climate change activities in Ghana include; Conservation International, Ghana; Friends of the Earth; Climate Care; Institute of Green Growth Solutions, Abibiman Foundation, Nature Conservation and Research Centre; Abantu for Development; Environmental Applications and Technology Centre (ENAPT Centre).

Government as part of its efforts in boosting the capacity of all climate change activity stakeholders developed a capacity building (i.e. support mechanism) initiative known as 'KASA'¹⁵ which has been very beneficial to NGOs and CSOs especially whose nature of activity bothers on natural resource and environmental governance in Ghana. Despite the high level of involvement of most NGOs and CSOs in climate change related activities, their activities are still hampered by a number of challenges such as weak technical capacity to research climate change issues, inadequate funding and poor coordination (MESTI, 2013).

On the other hand, Ghana has seen to a large extent a high level of International organisations' involvement in climate change activities either through capacity building or financial support. The Embassy of the Kingdom of the Netherlands, the UK Department for International Development (DFID), the European Union, the French Development Agency, the World Bank, UNEP, UNDP, and DANIDA are among the development partners that have offered various technical supports in the area of climate change. However, a constant challenge affecting most donor support is the lack of harmonisation between donor projects, which in some cases lead to duplication of efforts. Also, there is little coordination between international organisations - due mainly to the fact that prior to the development of the NCCP there was no specific framework for donors to channel their support through.

¹⁵ In recognition of the important role that civil society plays in natural resource and environmental governance in Ghana, the Government of Ghana and development partners, under the Natural Resources and Environmental Governance (NREG) framework (initially funded by the Embassy of the Kingdom of the Netherlands, the UK Department for International Development (DFID), the European Union, the French Development Agency, and the World Bank) supported the establishment of a Natural Resources and Environment (NRE) sector-specific support mechanism for civil society organisations, to enhance their role and participation for effective natural resources and environmental governance in Ghana. This NRE CSO support mechanism is known as 'KASA', literally meaning 'speak out' in Twi. The KASA framework supports capacity-building of CSOs, coalitions/networks for coordinated engagement and evidence-based advocacy for transparency, accountability and policy responsiveness in natural resources and environmental governance"(MESTI, 2013:53).

Section 6: International Developments in Climate Change Learning

6.1: Introduction

In the last two decades, Climate Change and Environmental Education (CCEE) and Education for Sustainable Development (ESD) have become major tools for protecting the environment and ensuring sustainable development.

Climate change education, training and public awareness has become pivotal to most international conventions such as the United Nations Framework Convention on Climate Change (Article 6 of the Convention). To meet obligation of these commitments, the National Climate Change Policy mentions **capacity building; education, information and communication** (2 out of 9) in its priority activities, as systematic pillars which must be built on in order to achieve the objectives of the policy among others.

6.2: Climate Change Learning at the Global Level

United Nations Education, Science, and Cultural Organisation (UNESCO) has championed climate change education through education within the framework of the UN Decade of Education for Sustainable Development (DESD), with the objective of making climate change education a more central and visible part of the international response to climate change. The UNESCO programme is also targeted at helping young people appreciate the impact of global warming today and increase "climate literacy" This, UNESCO hopes to achieve by strengthening the capacity of its Member States to provide quality climate change education; encouraging innovative teaching approaches to integrate climate change education in school and by raising awareness about climate change as well as enhancing non-formal education programmes through media, networking and partnerships.

At the Conference of Parties (CoP 20) in Lima Peru in December 2014, emphasis was placed on the need to train teachers on climate change education and the importance of the Global Action Programme on Education for Sustainable Development for advancing climate change education by developing education strategies that incorporate the issues of climate change in curricular, while also raising awareness on climate change in the design and implementation of national development and climate change strategies

6.3: Action by African States towards climate change learning

In 2007, African heads of state adopted the African Union's Declaration on Climate Change and Development in Africa (ClimDev-Africa).^{16,17} The Declaration on Climate Change and Development also called on member states to ratify the Kyoto Protocol; participate in the UNFCCC; build capacity, and invest in data collection and early warning systems; integrate adaptation strategies into country policies; raise awareness; strengthen cooperation between national meteorological offices, hydrological centres and regional economic communities (RECS); strengthen research, especially in renewables, forestry and agriculture to increase resilience; transfer technologies; put pressure on developed countries on the 'polluter pays' principle to seek deeper greenhouse gas emission cuts. The Declaration also mandated the Africa Union (AU) Commission to follow up with the African Ministerial Conference on Environment (AMCEN), the United Nations Economic Commission for Africa (UNECA) and the African Development Bank (AfDB) (UNESCO, 2013)

A number of decisions and actions have been taken 2007 through the AU (including heads of states) and the AMCEN to establish joint positions in international negotiations and to set up institutions, including the ClimDev-Africa¹⁸ (UNESCO, 2013)

The ClimDev-Africa's ACPC¹⁹ capacity building programme has been instituted to enhance the capacity development of African Institutions and individuals in relation to climate change policy analysis. **Specifically, the programme seeks to;**

- Build solid climate change knowledge based on facts and scientific evidence;
- Promote climate change education, research and innovation;
- Build the capacity of key stakeholders to become active participants in the response to climate change through training;
- Build the capacity of young Africans with fellowship programmes by engaging university students and academics;
- Enhance climate change research capacity in African universities and research institutions by offering research grants, supporting programme development and mainstreaming climate change related university curricula;

¹⁶ The Climate for Development in Africa (ClimDev-Africa) Programme is an initiative of the African Union Commission (AUC), the United Nations Economic Commission for Africa (ECA) and the African Development Bank (AfDB). It is mandated at the highest level by African leaders (AU Summit of Heads of State and Government). The Programme was established to create a solid foundation for Africa's response to climate change. Beyond the AUC-UNECA-AfDB partnership, the programme works closely with other African and non-African institutions and partners specialised in climate and development.

¹⁷ African Union, 2007, *Declaration on Climate Change and Development in Africa*. Eighth Ordinary Session, 29-30 January 2007 (<http://www.sirtewaterandenergy.org/docs/DeclarationClimateChange-AddisAbaba.pdf>)

¹⁸ See <http://www.climdev-africa.org/>

¹⁹ The African Climate Policy Centre (ACPC) was established at the UNECA Headquarters in Addis Ababa in 2010

- Build capacity and increase the awareness of African policy makers such as government officials, parliamentarians, negotiators, and regional economic commissions through direct short term training, seminars and roundtables;
- Provide tailor-made climate change training programmes for journalists and media professionals;
- Develop innovative programmes and initiatives such as national and regional networks, communities of practice and an African panel on climate change; support national panels so that knowledge generation in Africa is enhanced, and relevant platforms are developed and owned by Africans.

The programme is also expected to achieve the following;

- Improved capacity at national and regional level in research, analysis, formulation of policy to monitor and evaluate the impact of climate change on African development;
- Improved research capacity of selected African universities to address climate change;
- Increased awareness of policy-makers, legislators and other selected stakeholders on climate change risks and their impact on socio-economic development;
- Increased availability and more efficient utilisation of climate information and knowledge resources in support of Africa’s development;
- Strengthened collaboration and networking for more efficient climate change information, knowledge and services sharing, and programme implementation.

6.4: Current Climate Change Learning Framework in Ghana

Ghana has nominated a National Focal point for Article 6 of the UNFCCC Convention which stresses climate change education, training, and public awareness, who acts as the country liason with the UNFCCC regarding climate change education.

The country through the Environmental Protection Agency (EPA) developed a work plan for climate change education training and public awareness in 2012. The Climate change education in schools (CCES) programme was also launched in 2014 by EPA

Section 7: Climate Change Learning in Ghana-Stakeholder Needs and Existing Initiatives

7.1: Introduction

In recent years, the scale and impact of climate change related disasters have increased rapidly causing not only various degrees of loss to lives and property but eroding the modest economic gains made by the country and destroying some very critical national infrastructure. One of the major factors that increase the resilience of a community is the people's awareness of disasters and how to prevent or reduce their incidence. It is therefore necessary for all stakeholders to understand why certain activities have detrimental effects on the climate and how it will affect their livelihood in turn.

Consequently, education, raising of public awareness and training for sustainable development should be linked to all areas of environmental management. People need to be educated on specific adaptation strategies to help protect them from the impacts of climate change. Farmers and others who are directly affected by climate change need to be educated on existing adaptation strategies they could use to secure their livelihoods and create a safer environment.

7.2: Existing Formal, non-formal and informal climate change learning programmes

Below are information on current on current formal, non-formal, and informal educational programmes on climate change.

Table 5: Research Institutions and Their Initiatives under Climate Change from an Agricultural Perspective

Institution/Research Centre	Research/Initiative
<p>West Africa Science Centre on Climate Change and Adapted Land use (WASCAL)</p>	<p>WASCAL is a large-scale research-focused Climate Service Centre mandated to help tackle the challenges of climate change in West Africa. Funding is from Government of Germany. Ghana is among the ten West Africa Nations benefiting from WASCAL and host the headquarters (Legon) and the Land use Centre (KNUST). In Ghana, the collaborating institutions of WACAL are; University of Ghana, Kwame Nkrumah University of Science and Technology, Ghana Meteorological Agency, MESTI).</p> <p>WASCAL is organized around three main components namely – (a) Competence centre and Observation Network, (b) Core Research Program and (c) Graduate studies Program. The activities of the WASCAL Core Research Program are grouped into six research clusters: (a) climate and weather; (b) landscape dynamics,(c) agricultural systems; (d) markets and livelihoods; (e)risk management; and (f) integrated assessment. The research Program cluster has produced extensive datasets and peer reviewed papers on vegetation structure, hydrology, farming systems and innovations, soils, landscape dynamics etc. These products are useful to support evidence-based policy and practice on climate change. WASCAL is running until the end of 2018.</p>
<p>CSIR-Crop Research Institute, KNUST, WASCAL, University of Cape Coast, Forum for Agricultural Research in Africa (FARA), ISSER, West Africa Regional Office - International Network for Bamboo and Rattan (INBAR)</p>	<p><i>Improving food security in Africa through increased system productivity of biomass-based value webs (BiomassWeb):</i></p> <p>Ghana is one of three African Countries participating in the BiomassWeb research with funding from the German Government. BiomassWeb aims to provide concepts to increase the availability of and access to food in Ghana through more and higher-value biomass for food and non-food purposes in the next decades. BiomassWeb is structured around the analysis of biomass demand, supply and related value webs, research innovations, and implementation including capacity and network building. In Ghana, the research study sites are located in Ashanti Region, Brong-Ahafo Region, and Bolgatanga, Upper East Region. The research partner institutions in the country</p>

	includes; CSIR-Crop Research Institute, KNUST, WASCAL, University of Cape Coast, Forum for Agricultural Research in Africa (FARA), ISSER, West Africa Regional Office - International Network for Bamboo and Rattan (INBAR). The research is running from 2013 to 2018.
CECAR-Africa - (United Nations University Institute for Natural Resources in Africa)	<i>Enhancing Resilience to Climate and Ecosystem Changes in Semi-Arid Africa: An Integrated Approach:</i> The goal of the CECAR-Africa Project is to enhance resilience to climate and ecosystem changes in Semi-Arid Africa, with a particular focus on the northern part of Ghana. UNU-INRA undertakes research and implements capacity development programs for local residents and professionals in Northern Ghana (social institutions, technical capacity development) in collaboration with UNU-ISP and UDS. Other partner institutions on the project include: University of Tokyo and Kyoto University in Japan and University of Ghana and Ghana Meteorological Agency in Ghana. This 5-year project (2012-2016) is funded by Japan Science and Technology Agency (JST) and Japan International Cooperation Agency (JICA) through a scheme called SATREPS.
CLIMAFRICA – CSIR-Crop Research Institute	CLIMAFRICA is an EU sponsored research program in which Ghana is participating with other 10 European and 8 African Countries. The research focuses on developing improve climate prediction on seasonal to decadal climatic scales; assessing impacts in water and agriculture sector of the economy; evaluating vulnerability of the ecosystems and civil population; suggest and analyze new adaptation strategies; develop a new concept monitoring and forecasting warning systems. The research site is the communities around Ankasa Forest Reserves. The project run for the period 2010 – 2014. The other partners are CSIR Soil Research and Forest Research.
CSIR-Forest Research Institute (FORIG)	<i>Does shifting Carbon Use Efficiency determine the growth rates of intact and disturbed tropical forests? Gathering new evidence from African forests:</i> This was a joint research between FORIG and University of Oxford with funding from the Government of the United Kingdom through the Natural Environment Research Council. It started in 2011 and ended in 2014. The research sites are Bibiri Forest Reserve and Kogyae Strict Nature Reserve (KSNR).The research aims to address fundamental hypotheses on the relative importance of photosynthesis and autotrophic respiration in determining forest function in intact and disturbed tropical forests.
FORIG	<i>Savannah forest boundary transition in West Africa - Coupling the energy balance and hydrology and carbon cycles across the biome:</i>

	This research is sponsored by the European Union and focuses on assessing the energy balance and carbon fixation regime in savannah vegetation in the forest savannah zone of tension. The research partners are FORIG and Wageningen University.
Nature Conservation Research Centre (NCRC)	<i>Payment for Watershed Services on the role forest in generation of rainfall in Ghana:</i> The research is a collaboration of NCRC, FORIG, WRC and University of Oxford which seek to assess the ecosystem limits for poverty alleviation. The research is part of the global project on ecosystem service for poverty reduction (ESPA). The government of United Kingdom provided funding.

Source: Third National Communication, 2015

Table 6: Climate Change related courses offered by tertiary institutions

Course/Program	Institute/Department	University	Field
MSc and MPhil) in Climate Change and Sustainable Development	Department of Geography and Resources Development, School of Business	University of Ghana, Legon	Multi-disciplinary
Bachelor in Geography	Department of Geography and Resources Development	University of Ghana, Legon	Climatology
MSc. Climate Science and Meteorology	Department of Physics	KNUST	-
MSc. Environmental, Science, Policy and Management	Department of Urban and Environmental Management	Institute of Local Government Studies, Accra and Tamale	Climate change to inform decision making processes
Post-graduate studies	Institute of Environmental Studies and Sanitation	University of Ghana, Legon	Climate Change Adaptation
Post-graduate studies	Regional Institute for Population Studies	University of Ghana, Legon	
MSc. Renewable Energy	Mechanical Engineering and Energy Centre	KNUST	Climate mitigation
MA in Environment and Resource Management	Faculty of Integrated development studies	University of development studies	Climate change

MA Geography and Regional Planning	Department of Geography and Regional Planning	University of Cape Coast	Climate Adaptation and mainstreaming issues, Climatology
MSc Sustainable Energy Management	Department of Energy and Environmental Engineering	University of Energy and Natural Resources	Low carbon development issues
Dual Degree Program in Master of Science in Bio-Economy and Natural Resources	Forest Research Institute (FORIG) and KNUST	University of East Finland	REDD+, Carbon Trading

Source: Third National Communication, 2015

Table 7: Public awareness and training Programs

Institutions	Public Awareness Program	Level/Target
Centre for African Wetlands, University of Ghana and Ghana Wildlife Society	Local community fora and stakeholder consultative meetings organized to seek and exchange views with communities concerning climate related issues.	Community and district levels
Crop research institute	CLIMAFRICA; community members around the Ankasa forest reserves were involved in an awareness program on identification of climate change coping strategies and development of adaptation strategies	Community level
Nature Conservation Research Centre	Trainings, workshops, and capacity building events focused on climate change, REDD+, biomass sampling, biomass mapping, climate smart cocoa, and payments for watershed services.	Community and national level
The Swedish Environmental Institute, the United Nations International Strategy for Disaster Reduction (UN-ISDR) and UNU-INRA	Regional write-shop for Anglophone African Countries in Accra. This was a training workshop for scientific writing for publishing in the area of disaster risk reduction and climate change adaptation. The write-shop attracted 14 participants from 7 countries, namely Ethiopia, Ghana, Kenya, Malawi, Nigeria, Tanzania and Zimbabwe. UNU-INRA staff served as resource persons at the write-shop.	Sub-Saharan Africa Region
UNU-INRA and ADI/AfDB	Expert Meeting on 'Mainstreaming Energy, Climate Change and Green Economy Mechanisms in Private Financial Institutions in Africa'	Africa Region

UNU-INRA	Education for Sustainable Development in Africa. Develop and test a graduate-level education Program for professionals to be engaged in sustainable development in Africa.	University of Ghana, Kwame Nkrumah University of Science and Technology, the University for Development Studies, University of Nairobi, Kenyatta University, University of Cape Town and the University of Zambia.
Forest Research Institute (FORIG)	Fifty four communities around the Ankasa conservation area have been trained on forest carbon assessment	Community level
Forestry Commission	Series of sensitization workshops organized for various levels of stakeholders to enhance understanding of climate change issues targeting	Private sector, NGOs, CBOs, local communities and traditional authorities and Government agencies including the frontline staff of the forestry commission.
Environmental Protection Agency	- AAP high level awareness creation programme	Chiefs, Parliamentarians , Second cycle institutions
	- District capacity programme	
	- Environmental education in Schools programme	General public
	- Environmental awareness in ICT	
	- Number of radio and TV interviews	
Ghana Wildlife Society and Environmental Protection Agency, Ghana Education Service and Wildlife Division	Developing manual on outdoor Environmental Education to complement the national curriculum for primary and Junior High Education with emphasis on emerging environmental challenges including climate change.	Primary and Junior High Education
Ghana Wildlife Society	Periodic training is given to teachers/club coordinators to enhance their teaching of Environmental Education, organize educational tours for schools/club members and competitions among clubs.	Environmental clubs
	Train teachers in each school as wildlife club coordinators; establish zonal coordinators that help to supervise all coordinators within a town or zone.	Train teachers

Source: Third National Communication, 2015

Section 8: Climate Change Learning Strategy

8.1: Introduction

As already discussed in section 5 of this report, a number of interventions at the global level signifies the importance the global community places on climate change education and capacity building.

The various national priorities related to climate change are defined in this report. There is the need to develop appropriate educational and public awareness programs on climate change and its effects and ensure that they are fully implemented. Public access to relevant and reliable information, scientific personnel training, technical and managerial competence of the identified homogeneous groups of people²⁰ and institutions who have similar capacities and competences can be strengthened with the same learning strategies. Based on the categories of individuals and groups, forms of learning and types of institution, specific strategic actions can be taken to improve learning on the issues of climate change while at the same time strengthening institutional capacities

8.2: Why a National Strategy on Climate Change Learning

A National Climate Change Learning Strategy offers a systematic approach for planning a sustainable country-driven, and results oriented climate change educational programme. It enables countries to take stock of existing initiatives, identify gaps as well as prioritise proposed actions. A National Climate Change Learning Strategy will also ensure that all sections of the population acquire knowledge, skills, values and attitudes necessary to develop the needed responsible environmental behaviour that fosters environmentally positive changes in society.

Specifically, a National Climate Change Learning Strategy will help achieve the following:

1. Assess existing human resource capacities and skills in key sectors to address climate change;
2. Prioritize actions to enhance climate change learning and strengthen national education and training systems;
3. Ensure that climate change learning is linked to and helps to achieve national climate change objectives;
4. Identify gaps and help mobilise resources for training and skills development from national budgets and external partners;
5. Support the creation of a sustainable human resource base to address climate change.
6. Integrate environmental and sustainable issues into the curriculum at all levels of education to improve the quality of learning and take it relevant to the needs of the society.

²⁰ Homogenous groups of people refer to people with the same characteristics

7. Build the capacity of education leaders, managers of industries and other practitioners to have commitment and ability to ensure sustainable development,
8. Enhance the quality and relevance of higher education programmes to respond to development challenges through research and training,
9. Promote networking, cooperation and coordination among stakeholders in Climate Change Education in Ghana,
10. Promote education and awareness at the non-formal level to increase public participation in sustainable environmental development,
11. Strengthen the leadership role of parliamentarians and government agencies in aligning policies, regulations and operational framework to support Climate Change Education and its integration into development planning,
12. Build the capacity of the media to report, communicate information and educate the public on pertinent Climate Change Education issues.

8.3: Implementing the National Climate Change Learning Strategy

According to the Accra Agenda for Action (AAA), three cardinal pillars need to be considered in developing a National Climate Change Learning Strategy. These pillars include:

1. Country Ownership

This pillar emphasizes the need for National Climate Change Learning Strategies to be inter-sectoral and be endorsed by these various sector players and secondly, make use of existing country learning systems.

2. Inclusive Partnerships

The AAA also stresses that to ensure inclusive partnerships for national climate change learning strategies;

- There should be the engagement of national education/training institutions and non-governmental organisations
- There should be the engagement of UN agencies and other development partners involved in strategy development and support aligned with national priorities

3. Deliver Results

The AAA mentions that for national strategies to deliver results;

- Strategy objectives and targets should be agreed upon at the very beginning
- There should be evaluation of overall strategy implementation results in medium and long-term

- There should be evaluation of individual learning activities with emphasis on whether skills are applied on the job

8.4: Identifying Key responsibilities for an implementation framework

According to the Guidance Note for Developing a National Climate Change Learning Strategy (2013) the implementation framework should define clear responsibilities in terms of the following key areas:

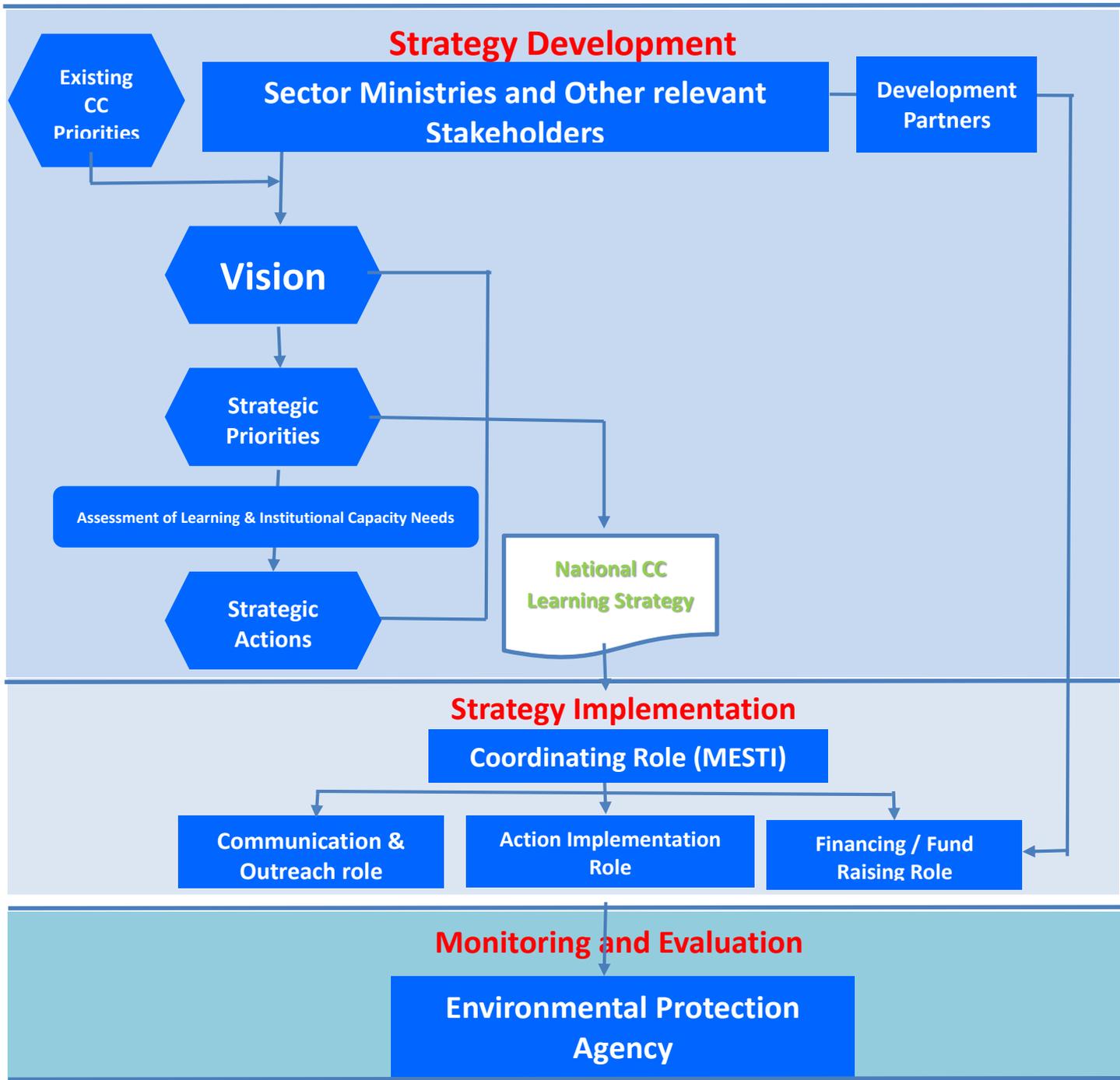
- **Coordination:** There should be an institution that will coordinate operational activities, i.e. develop an annual work plan; organize coordination meetings with different sectors and stakeholders; etc. *It is however critical that the coordination role be done by an existing body.*
- **Financing / Fund-raising:** Identify how funding for Strategy implementation will be raised and which institution will be responsible for this role. [For example, in terms of integrating learning actions in sectoral budgets or drafting of project proposals for external fund-raising].
- **Communication and outreach:** There should be a dedicated institution which will be responsible for sharing information about implementation activities, including sharing of new learning materials, writing press releases, participating in regional and international fora, etc.
- **Implementation of specific actions:** Institutions that will lead the implementation of specific parts of the Action Plan should be identified with the implementation framework
- **Monitoring and evaluation:** Institution/committee that will provide monitoring and evaluation functions also need to be identified

Table 8: Proposed Institutional Arrangement for implementation of CC Learning Strategy in Ghana

Role	Proposed Institution/Body
Coordination	Ministry of Environment, Science, Technology, and Innovation (MESTI)
Fund-raising/Financing	Ministry of Finance Development Partners
Communication and Outreach	Environmental Protection Agency (EPA) Ghana Education Service Media
Implementation	Ministry of Education / Ghana Education Service Academic Institutions Non-Academic Training Institutions Media NGOs / CBOs / CSOs / Faith-based Organisations Other relevant sector ministries (Agriculture, MESTI, Ministry of Local Government) MMDAs

	National Commission for Civic Education (NCCE) Ministry of Communication Private Enterprise Federation / Association of Ghana Industries
Monitoring And Evaluation	Environmental Protection Agency (EPA)

Figure 2: Proposed Climate Change Learning Strategy Development and Implementation Framework



Section 9: Conclusion and Recommendations

9.1: Conclusion

This background paper indicates that there has been a substantial effort in climate change mainstreaming in the country and a lot of investment from donor partners in both climate change adaptation and mitigation across all climate change management structures in the country. However, knowledge and skill for climate change mitigation or climate science is generally inadequate across all levels. The major contributing factor to the prevailing capacity situation is due to the fact that climate change is a new phenomenon, much of which is also highly technical. Ghana's strategic Plan for Environmental Education developed by the Environmental Protection Agency could be used as a model in increasing the capacity needs of all stakeholders in the country to adapt to climate change. It must be acknowledged that the launch of Ghana's first climate change and environmental policies has initiated the process for a long term commitment from all levels especially from political leadership to ensure the effective implementation of Ghana's climate change policy.

This background paper also points to the fact that efforts in building skill and knowledge capacity in climate change science in government have been minimal so far with almost all the on-going initiatives mostly funded by donor resources. Lack of climate change integration in strategic plans and policies has hampered leadership commitment to climate change resource mobilisation from the national budget. This is an opportunity to address climate change considerations into strategic plans and policies to ensure that they are also supported from the mainstream government budget.

The report also noted that there is the need for training in the formal, non-formal and informal sectors. Improving the training interventions will contribute to improved delivery of outputs in the climate change agenda.

It must also be added that the training intervention to address climate change training capacity gaps will need to be a comprehensive one in order to enable the country make progress in driving the climate change agenda. A combined package of well-funded and targeted short and long term training as well as strengthening the capacity of institutions that already train the citizenry on climate change. Both a theoretical and practical study tours should constitute the training plan intervention in the short and long term perspective. Such a strategic approach to capacity building will contribute significantly towards the achievement of climate change outcomes.

9.2: Recommendations

In order to ensure climate change adaptation and mitigation, the need for training and capacity building of the citizenry must be pursued with a new zeal and paradigm shift from the business as usual scenario. The authors therefore make the following recommendations for training and capacity building, which are pillars in Ghana's climate change policy:

1. To address climate change knowledge and skill gaps at national level there is the need to develop a comprehensive and focused training plan for all
2. From primary school through teacher education curriculum to Universities, climate change must be an integral part of Ghana's education requirements in order to mainstream and build

capacity – The EERP module by UNICEF and other UN and international learning resources will provide critical help and insight

3. For professional staff in the civil service, funds must be mobilized to provide short courses and workshops to build their capacity at the civil service training centre or at Universities.
4. Even though there are already existing educational programmes on climate change, funds should be made available to provide courses such as climate modelling and GHGs monitoring to help further expand the frontiers of climate change education and capacity.
5. In the design of a climate change programme for training and capacity building, effort must be made to incorporate the relationship between climate change, land use, natural resources, waste management, energy, gender and health.
6. Stakeholders such as media and NGOs need to be trained at workshops, and short courses at higher education institutions on climate change to enable them understand the concept of climate change and improve their reporting skills and therefore position them strategically in advocating the climate change agenda
7. The EPA (lead institution) must collaborate with other relevant institutions such as schools, NGOs media etc to develop an awareness strategy on climate change to increase awareness of climate change at district, regional and national level.
8. It is also recommended that climate change ambassadors be supported and their capacity developed at districts, regional and national levels in order to have role models at each sector of national development.
9. On a regular basis, refresher courses must be organized for decision makers so they are abreast with current situation with regards to climate change.
10. The UNESCO Series on Journalism Education provides very important nuggets on how journalist, and by extension media personnel can build their capacity to report on climate change. The resource is therefore recommended for training media personnel on how to report climate change

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