# CLIMATE CHANGE ADAPTATION FINANCING IN GHANA

**February 2023**

# Table of Contents



# List of Tables



# List of Figures

## List of Acronyms

| | |
|---|---|
| AFAWA | Affirmative Finance Action for Women in Africa |
| ARAF | Acumen Resilient Agriculture Fund |
| GDP | Gross Domestic Product |
| GHG | Green House Gases |
| LEAF | Leveraging Energy Access Finance |
| MDGs | Millennium Development Goals |
| MDA's | Ministries Department Agencies |
| MMDA's | Metropolitan Municipal District Assemblies |
| NAP | National Adaptation Plan |
| NAMA | National Adaptation and Mitigation Actions |
| NCCAS | National Climate Change Adaptation Strategy |
| NCCP | National Climate Change Policy |
| NDCs | Nationally Determined Contributions |
| SDG's | Sustainable Development Goals |
| UNFCC | United Nations Framework Convention on Climate Change |
| VNR | Voluntary National Review |


## Acknowledgement

We acknowledge Oxfam in Ghana for their partnership and financial support through the TAP/GROW project. Also, the time spent by small holder farmers who participated in the interviews are much appreciated.

# Executive Summary

## Introduction

The adverse impact of climate change on food insecurity in Ghana in general and the livelihoods of small holder farmers in particular, cannot be overemphasised. Financing for climate change adaptation and mitigation is thus critical. The current study thus assessed government commitments at the Global, continental and national level towards mitigating climate change impacts on the country, examined the level of climate financing by government and asseseds small holder farmers' climate change adaptation and mitigation practices.

## Study Findings

- Ghana has made strides in its global, continental and national level commitment to climate change mitigation and adaption, including the Montreal Protocol, the Kyoto Protocol and the SDG's. The government has also created the National Climate Change Policy (NCCP), National Determined Contributions (NDCs), National Adaptation and Mitigation Actions (NAMA), National Adaption Plans (NAP), National Climate Change Adaptation Strategy (NCCAS), among others.
- Ghana's climate actions are funded by multiple sources, including Government of Ghana, as well as bilateral and multilateral organisations, with the majority of funds coming from multilateral sources. The largest contributor to the country's climate action comes from the Green Climate Fund.
- Small holder farmers are aware of and are experiencing the adverse impacts of climate change. The farmers adopt practices to adapt and/or mitigate the adverse impact of climate change including varying planting dates, crop diversification, diversification into non-farming activities, irrigation farming and the use of improved seedlings that can resist heat.
- Small holder farmers are willing to pay a premium for index-based weather insurance to avert the adverse impact of climate change.

## Recommendations

- It is critical that the government prioritises domestic funding of climate change mitigation and adaptation programmes, by making specific yearly allocations in the national budget statement and economic policy. Metropolitan, Municipal and District Assemblies (MMDA's) should as a matter of priority also do same.
- Climate finance information, including revenues, and expenditures should be published in a timely fashion.
- Government should put in place the right regulatory framework and encourage the private sector to establish index insurance, since farmers have established interest and are willing to pay premium to enrol on the climate insurance to avert adverse impact of climate change.

# 1.0 Background

"Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. [1]Climate change has become one of the most topical issues in the world today. This is because of its dire impact on many sectors of the world's economy. Climate change is estimated to cost the world economy around $7.9 trillion in 2050 due to increasing droughts, flooding and crop failures which would hamper growth and threaten infrastructure (Economist Intelligence Unit EIU, 2019)[2]. Evidence reviewed by the Cambridge Commission shows that over the period 1990–2015, nearly half of the growth in absolute global emissions was due to the richest 10%, with the wealthiest 5% alone contributing over a third (37%)[3].Climate change impacts however adversely affects developed countries lesser as compared to developing countries, who often have done the least to contribute to it. Climate change is fundamentally an issue of justice. Its impacts are felt disproportionately by the poorest communities.

An analysis by EIU that sought to assess countries exposure to climate loss found Africa to be most at risk with 4.7% of its GDP in the balance. Further details show an average GDP loss of 1.1%, 1.7%, 2.6%, 3%, 3.7% and 3.8% to North America, Western Europe, Asia Pacific, Eastern Europe, Middle East and Latin America respectively (EIU, 2019). Climate change impacts are manifesting in increasing weather temperatures, change in rainfall patterns, droughts, storms, rising sea levels, ocean acidification and extreme weather events which are affecting the lives of people. This has implications for food security, livelihood security, peace, migration inter alia. Owing to the devastating effects of climate change, efforts have been made at the global level to ensure climate change resilience. These actions have seen the coming into force a number of agreements such as the Montreal Protocol, Kyoto Protocol and more recently the Paris Agreement. This is a recognition of the potential of climate change to reset economic growth across the globe.

Climate change impacts in Ghana are no different from what is seen in other countries, and its dire effect on the agriculture sector, which has been classified as the backbone of the Ghanaian economy, cannot be understated. In 2020, the share of agriculture in Ghana's gross domestic product was 19.25 percent, and it accounts for over 30% of export earnings and serves as a major source of input to our manufacturing industry. In 2019, 33.5% of the labour force in Ghana was absorbed by the agriculture sector[4]. The impacts of climate change in Ghana presents a major food, livelihood and national security issue; which could lead to hunger and starvation, disease outbreaks and pest infestations as well as migration. This is a sector already challenged with access to inputs, storage facilities, land, credit, extension services, low mechanisation, poor on/off farm practices and technology constraints.

[1]https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
[2]Patrick Galey (2019), Climate impacts 'to cost world $7.9 trillion' by 2050. Economic Intelligent Unit https://phys.org/news/2019-11-climate-impacts-world-trillion.html
[3]https://www.rapidtransition.org/resources/cambridge-sustainability-commission
[4]https://itrade.gov.il/ghana/files/2020/05/Agriculture-Sector-Review.pdf

Agriculture is estimated to be the second largest contributor to greenhouse gas emissions after the energy sector in Ghana (Alessandro et. alIFPRI, 2012)[5]. The country already has experienced an increase in mean annual temperature of 1 degree Celsius per decade since 1960. This has contributed to deterioration of ecosystems, pest infestation and diseases, increased post-harvest losses, reduced food accessibility and consumption, decreased livestock values, yield reduction, natural disasters, migration which have the potential to degrade human and social capital and devalue assets and infrastructure in agricultural communities. Rural populations in the northern regions of Ghana are more vulnerable to climate change than other regions. A related study by IFPRI on climate impacts on rain fed maize, rice and groundnuts showed an overall decrease in yields by 2050, with groundnuts experiencing the highest decrease[6].

This amongst other calls for actions to reduce climate impacts on the country and its citizens through the institution of policies, actions and commitments. As mentioned above, some strides have been made at the global level towards addressing climate impacts. Ghana, as signatory to the United Nations Framework Convention on Climate Change (UNFCCC), has been involved in a number of activities aimed at addressing the climate change challenges. However, it is imperative to ascertain the level of government responsiveness and commitment towards climate change mitigation, adaptation and financing. This is critical because climate change, does not only threaten the environment and achievement of development, and poverty reduction, but also, could potentially reverse the gains made so far towards attaining the Sustainable Development Goals (SDGs).

It is against this backdrop that SEND Ghana, as part of the activities under an Oxfam funded GROW/TAP project commissioned this study with the view to contribute to knowledge and use the findings to engage relevant stakeholders to ensure increase government commitment towards climate finance and adaptation in Ghana.

## 1.1 Objectives of the study

The primary objective of the study is to generate evidence and use the evidence to engage the Government of Ghana towards Climate Change Adaption Financing Commitments.

The specific objectives are to:

1. Assess government commitments at the Global, continental and national level towards mitigating climate change impacts on the country.
2. Examine the level of climate financing by government.
3. Assess small holder farmers' climate change adaptation and mitigation practices

[5] Alessandro De Pinto, Ulaç Demirag, Akiko Haruna, Jawoo Koo, Marian Asamoah (2012). Climate Change, Agriculture, And Food Crop Production in Ghana. IFPRI POLICY NOTE #3 , SEPTEMBER 2012

[6] https://ebrary.ifpri.org/digital/api/collection/p15738coll2/id/130648/download

# 2.0 Ghana's Climate Change Adaption and Financing Commitments

This section reviews relevant literature on the climate change adaption and financing commitments looking with a focus on global commitments, national policies and strategies, as well as climate adaptation frameworks and climate financing landscape. At a glance, Ghana has made some strides towards climate change mitigations, adaption and financing.

## 2.1 Global Level Commitments

### 2.1.1 Kyoto Protocol

The protocol was first adopted in 1997 and entered into force in 2005 with 192 parties. The Kyoto Protocol operationalizes the United Nations Framework Convention on Climate Change (UFCCC) by committing industrialized countries and economies in transition to limit and reduce Greenhouse Gases (GHG) emissions in accordance with agreed individual targets[7]. In line with the protocols, emission limitation and reduction commitments could be achieved through parties implementing elaborate policies and measures in accordance with their national circumstances and also cooperating with other parties to enhance the individual and combined effectiveness of policies and measures adopted under article 2. The protocol enjoins parties in Article 11, clause 2 (a, b, c) to:

> (a) Provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in advancing the implementation of existing commitments under Article 4, paragraph 1 (a), of the Convention that are covered in Article 10, subparagraph (a); and
>
> (b) Provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention that are covered by Article 10 and that are agreed between a developing country Party and the international entity or entities referred to in Article 11 of the Convention, in accordance with that Article.[8]

In pursuant to article 4, paragraph 1 and article 12, paragraph 1 of the UFCCC, Ghana submitted its Initial National Communication to the conference of Parties (COP) in December 2000.

### 2.1.2 Paris Agreement

The Paris agreement is a treaty under the UNFCCC which came into force in 2015. The agreement seeks to further strengthen the global response to climate change by limiting global average temperature below 2 degrees Celsius above pre-industrial levels to 1.5 degrees Celsius;

[7] https://unfccc.int/kyoto_protocol
[8] https://unfccc.int/resource/docs/convkp/kpeng.pdf

increase climate change adaptability and ensuring consistent financial flows towards climate low greenhouse gas emission and climate resilient development. The Agreement requires all parties to put forward their best efforts through Nationally Determined Contributions and outline strategies to reduce national emissions and adapt to the impact of climate change.

Ghana became a signatory to the agreement in 2016 thereby adding up as one of the 197 parties to the agreement. In line with the agreement for countries to submit their Nationally Determined Contributions (NDCs) which represents action plans towards climate action, Ghana developed its NDC in 2015. The NDCs represents Ghana's domestic policy actions towards climate change mitigation and adaptation in line with the country's circumstance. The updated Nationally Determined Contributions are aligned with national policies and backed by concrete programmes that can be implemented by both the public and private sector as well as CSOs. In particular, the NDCs are built on already existing policies such as the National Communications, Biennial Update Report (BUR), National Adaptation and Mitigation Actions (NAMA), and the Technology Needs Assessment (TNA). The NDCs proposed 20 mitigations and 11 adaptation programmes in 7 priority sectors for implementation in a 10-year period between, 2020-2030 (NDCs, 2015). These priority sectors are (i) Sustainable land use including food security, (ii) Climate proof infrastructure, (iii) Equitable social development, (iv) Sustainable mass transportation, (v) Sustainable energy security (vi) Sustainable forest management; and (vii) Alternative urban waste management.

### 2.1.3 Sustainable Development Goals (SDG's)

The SDG's came into force in 2015 following the end of the MDGs to serve as a blueprint for a better and sustained future by reducing global issues such as poverty and climate change. Ghana has made commitments to the SDG 13 by taking urgent actions to combat climate change and its impacts. As a show of commitment to the SDG's, the country has National Climate Change Policy, National Climate Change Master Plan, Implementation Plan for Nationally Determined Contributions (NDC), Investment and Implementation Plan, National Climate Change Adaptation Strategy, 2016 National REDD+ Strategy, 2016-2040 National Forestry Plantation Strategy and 2018-2021 Medium-term Development Policy Framework[9]. Ghana in 2019 produced its 1st Voluntary National Review report which was presented at the UN High Level Political forum as part of which the country reported on its progress. The country reported on two indicators i.e.

(i) Indicator 13.2.1: Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)

[9] https://sustainabledevelopment.un.org/content/documents/23420Ghanas_VNR_report_Final.pdf

Under this indicator, Ghana reported that it had developed a climate change policy and action plan that seeks to enhance climate resilience and adaptation across all sectors as well as submitted its Nationally Determined Contributions (NDCs), national communications and biennial update reports to the UNFCCC. It further outlined some strategic documents in place to address climate change such as National Climate Change Policy; National Climate Change Master Plan; Implementation Plan for Nationally Determined Contributions (NDC) Investment & Implementation Plan; National Climate Change Adaptation Strategy; National REDD+ Strategy, 2016-2040; National Forestry Plantation Strategy and the Medium-term Development Policy Framework (2018-2021). The country was also considering a national financing mechanism to address renewable energy and gender without a rapid increase in funds and procedures.

(ii) Indicator 13.3.1 Number of Countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula (VNR, 2019).

Similarly, under this indicator, Ghana reported that climate change had been integrated into basic school level curriculum commencing from the 2019/2020 academic years, and teachers trained by Environmental Protection Agency on the Teaching and Learning Materials (TLMs). Also courses in climate change have been introduced in four public universities to promote climate related research and policy analysis with the motive of improving knowledge and behaviour to address climate change in the country.

The country in the last two years has also produced the 2019 and 2020 SDG Budget reports which both tracked actual SDG budgetary allocations and expenditures by MDA's and MMDA's as well as SDGs related information. In the 2019 SDG budget, it was reported that the GH¢121.69 million was allocated by the MDAs in 2018 in the SDG budget but in 2019 there was an increase of GH¢54.01 million amounting to GH¢175.7 allocation by MDAs towards climate action[10]. The budget went on to report that the highest fund in 2018 came from Government of Ghana (GOG) with an amount of GH¢44.86 million, whiles in 2019 the highest fund came from DP with an amount of GH¢128.8 million. The baseline report shows that target 13.3 received the most funds whiles in 2019 target 3.1 had the most funds with an amount of GH¢126.3 million ( SDG Budget2019). Also in the 2020 budget, it was reported that the process to develop a National Adaptation Plan (NAP) had been launched with the view to to develop temperature and rainfall scenarios up to 60 years into the future[11] as well as develop Climate-Smart Agriculture Investment Plan (CSAIP), commission a training centre, health post and football pitch at Old Fadama and implement the Ghana National Plastics Action Partnership and the Project on Marine Litter and Microplastics as part of its policy initiatives in 2020. In terms of allocations GH¢221.4 million was budgeted at the MDA and MMDA levels with a chunk of it i.e. GH¢117.3 million coming from IGF (Internally Generated Funds) (2020, SDG Budget). This presents

[10] https://mofep.gov.gh/sites/default/files/news/Ghana-SDGs-Budget-Report-July-2019.pdf
[11] https://mofep.gov.gh/sites/default/files/news/2020_SDGs_Budget_Report.pdf

the level of commitment of Ghana government towards achieving the SDG agenda 2020 targets specifically on climate change.

## 2.2 Climate Change Mitigation and Adaption Policies and Strategies

In line with the countries commitment to meeting the objectives in its global commitments to addressing climate change adaptation and mitigation, the Ghana has developed some impressive climate actions which are captured in the policy documents in place. Some of these include the National Climate Change Policy, National Climate Change Adaptation Strategy (NCCAS), and National Adaptation Plan Framework amongst others.

### 2.2.1 National Climate Change Policy

The National Climate Change Policy was developed with the vision of ensuring a climate resilient and climate compatible economy while achieving sustainable development through equitable low-carbon economic growth for Ghana (NCCP, 2013). The policy has three (3) main objectives which includes (i) effective adaptation, (ii) social development (iii) mitigation. The policy provides 4 thematic areas to address adaption issues in the country, which are (i) energy and infrastructure, (ii) natural resource management, (iii) agriculture and food security and (iv) disaster preparedness and response. The policy is also anchored on 7 systemic pillars to achieve the policy objectives, namely: (i) governance and coordination, (ii) capacity-building, (iii) science, technology and innovation, (iv) finance, (v) international cooperation, (vi) information, communication and education, (vii) monitoring and reporting. As highlighted in table 1 below, the policy further outlines the roles and responsibilities of some MDAs (Ministry of Environment, Science, Technology and Innovation, Ministry of Finance and Economic Planning, Ministry of Food and Agriculture), private sector and CSO's to ensure a coordinated approach to climate mitigation. With regards to, Private sector and CSO's the following roles are expected.

***Table 1: Roles and Responsibilities of MDAs, Private Sector and CSO's in National Climate Change Policy***

| Institution | Roles |
|---|---|
| Ministry of Environment, Science, Technology and Innovation (MESTI) | Protecting the environment through policy formulation and economic, scientific and technological interventions needed to mitigate any harmful impacts caused by development activities;<br>• Setting standards and regulating activities concerning the application of science and technology in managing the environment for sustainable development; |

| | |
|---|---|
| | • Promoting activities needed to underpin the standards and policies required for planning and implementation of development activities;<br>• Coordinating, supervising, monitoring and evaluating activities that support goals and targets of the ministry and national sustainable development; and<br>• Spatial planning of urban and rural areas |
| Ministry of Finance and Economic Planning (MoFEP) | • Oversee, coordinate and manage financing of and support to natural resources and climate change activities<br>• Function as the fiduciary administrator of the Adaptation Fund in Ghana<br>• Lead the inter-ministerial collaboration under the Forest Investment Programme (FIP) initiative by the World Bank Group to support REDD+ implementation in Ghana<br>• Coordinates the budget support programme under the NREG (Natural Resources and Environmental Governance) and FIP (Forest Investment Programme) initiatives<br>• Coordinates all forms of support (domestic and international) to climate-change–related activities in Ghana<br>• Engaged in the process of developing national climate change budgeting guidelines to facilitate mainstreaming climate change into national planning<br>• ... |
| Ministry of Food and Agriculture (MoFA) | • Lead public organization for the development of the food and agriculture sector and responsible for policy formulation, programming and coordination within the sector.<br>• Hosts and operates the national public agricultural extension service. |
| National Development Planning Commission | • Make proposals for the development of multi-year rolling plans, taking into consideration the resource potential and comparative advantages of the different districts of Ghana;<br>• Make proposals for the protection of the natural and physical environment with a view to ensuring that development strategies and programmes are in conformity with sound environmental principles;<br>• Make proposals for ensuring the even development of the districts of Ghana by the effective utilisation of available resources;<br>• Monitor, evaluate and co-ordinate development policies, programmes and projects;<br>• Undertake studies and make recommendations on development and socio-economic issues; |

| | |
|---|---|
| | • Formulate comprehensive national development planning strategies and ensure that the strategies are effectively carried out;<br>• Prepare broad national development plans;<br>• Keep under constant review national development plans in the light of prevailing domestic and international economic, social and political conditions and make recommendations for the revision of existing policies and programmes where necessary; and<br>• Perform such other functions relating to development planning as the President may direct. |
| Private sector | • Collaborate with the government to invest in climate-change-proof social and physical infrastructure, such as low-emission electricity generation, use of renewable energy as a means to promote energy access and enhancing energy efficiency |
| Civil Society Organisations (CSO) | • Community education and delivery of environmental services<br>• Research and climate change vulnerability analysis, emergency/disaster response and relief programming<br>• Facilitating models for community-based adaptation to climate change<br>• Promoting community consultations and participation<br>• Facilitating CSO mobilization and coordinated engagement with the Government on climate change<br>• Policy monitoring, and social accountability for equitable and pro-poor response to climate change. |

***Source: National Climate Change Policy, 2013***

### 2.2.2 National Climate Change Adaptation Strategy (NCCAS)

Ghana's NCCAS was formulated to enhance Ghana's current and future development to climate change impacts by strengthening its adaptive capacity and building resilience of the society and ecosystems[12]. It seeks to improve awareness and climate preparedness, enhance climate change mainstreaming, increase infrastructure robustness and investment as well as enhancing adaptability of vulnerable ecology and promote technological innovation. Responsibility of policy, planning, monitoring and evaluation is placed at the doorstep of MDAs whereas MMDAs are responsible for programme execution. The NCCAS has identified governmental and non-governmental organisations as implementing bodies to ensure national ownership and participatory efforts at managing the strategy implementation. This places MESTI as the lead institution at the national levels, district assemblies as implementing entities at the sub-national level and CSO's as monitors and producers of evidence based research.

[12] https://www.adaptation-undp.org/sites/default/files/downloads/ghana_national_climate_change_adaptation_strategy_nccas.pdf

### 2.2.3 National Adaptation Plan Framework (NAP)

Ghana created its NAP in 2018 to serve as a framework to guide the country in developing, coordinating and implementing its climate adaptation plans. The broad key objectives of the NAP framework are to:

- Clarify Ghana's approach to its NAP process. This will include an articulation of the country's vision of climate change adaptation, its adaptation objectives and principles, the roles played by stakeholders within the national government, and priority adaptation actions to be undertaken. It will also provide a reference point for bringing together various adaptation planning efforts from different sectors, sub-national structures and scales of decision making. Align the NAP process with existing policies, strategies and adaptation research.
- Identify specific themes that are particularly relevant and/or unique to the country context.
- Serve as a basis for stakeholder engagement.

The NAP process is built on a 6 prong approach in achieving its targets that focuses on private sector engagement, gender responsiveness, community based adaptation, ecosystem based adaptation and harmonising timeframes. The guiding principles for the NAP process includes youth involvement, broader stakeholder consultations, climate change harmonization, policy harmonization, alignment with SDG's, managing trade-offs. The NAP also stresses on the need for government to adopt a coherent and comprehensive resource mobilization strategy to enable the country's NAP process to be implemented.

## 2.4 Climate Financing Landscape in Ghana

To achieve the ambitious climate change targets, Ghana's 2022 budget statement and economic policy indicates that the country requires a total of US$9.3 billion in investments to implement the 47 Nationally Determined Contributions programmes from 2021 to 2030. Out of this amount, US$3.9 billion will be required to implement the 16 unconditional programmes over the next 10 years. The remaining US$5.4 billion for the 31 conditional Nationally Determined Contributions programmes will be mobilised from public, international, and private sector sources as well as climate markets[13].

Ghana's strong commitment to addressing climate change impacts has seen the signing of agreements, development of policy actions and strategies as highlighted above. However, the success of these will hinge on the availability of financial resources available to implement them. All policy documents reviewed so far, point to the need for financial resource mobilization efforts which could be leveraged through local and international sources. Thus, the mobilisation of sufficient financial resources is critical to ensure that Ghana is able to address the challenges associated with the effort to build a climate resilient economy.

[13]Ghana's 20202 Budget Statement and Economic Policy; page 98, paragraph 453

Consequently, Ghana is exploring more results-based climate financing options, both domestically and internationally.

The NDCs identified a number of local and international funding sources the country could leverage on to finance climate action. The NDC identified the national budget, corporate social responsibility and commercial facilities as local sources and the Green Climate Fund, multilateral funds, bilateral agreements, private capital investment and the international carbon market, as well as the climate impact bonds as the external sources. Aside, what is captured in the NDC, a number of climate finance sources have been found to also exist for developing countries, including the Global Environment Facility (GEF), World Bank Climate Funds (Clean Technology Fund & Strategic Climate Fund), Adaptation Fund, Hatoyama Initiative (Wurtenberger et al., 2011). Ghana since 1991 to 2011 has received $21million from the GEF. Funding for climate change in Ghana is mostly provided by multilateral and bi-lateral institutions such as the World Bank and UNDP[14].

In order to provide comprehensive data on climate relevant interventions and expenditure to ensure a better understanding of publicly funded climate change actions to inform government policy, the government of Ghana have completed two Climate Public Expenditure and Institutional Reviews (CPEIRs), in 2015 and the 2021. The 2015 CPEIR helped to identify some of the institutional challenges, including how climate resources were allocated. Recommendations from the CPEIR led to the realignment of the climate institutional set up and raised the profile of climate relevant programs which saw an improvement in funding. Capacity building was key to enabling the implementation of related reforms. Since then, the government has prioritised climate change, resulting in significant growth in the allocation to climate change adaptation and mitigation. Generally, the 2021 CPEIR (covering the period 2015-2020) highlighted issues around policy consistency, revealing there was very little synergy between institutions resulting in the duplication of mandates and functions. It also reviewed the relevance of the tags which were applied in 2015 and identified new areas of tagging. Additional challenges were highlighted, for example off budget inflows, which are currently not captured. The review showed that the country spent GH¢14.5 billion on various climate change interventions over the five-year period (2015-2020); and thus constitute an average of 3.94 percent of total government expenditure. It must be acknowledged that although the country has seen some progress, more needs to be done, particularly at the sub-national level.

A review of the 2022 national budget statement and economic policyshow there is no specific budgetary line to climate change even though quite a number of climate change activities are listed. However, in Appendix 10F (page 286-289) of the 2022 budget, there are Environmental, Social and Governance (ESG) expenditure framework list some examples of eligible budget expenses for certain Ministries, Departments and Agencies (MDAs) that relates to climate change adaptation and mitigation. Key ministries involved in climate change interventions (i.e.

[14] Cameron C (2011) Climate change financing and aid effectiveness. Ghana Case Study. Available at: www.oecd.org/dac/environment-development/48458430

the Ministries of Environment, Science, Technology and Innovation, Sanitation and Water Resources, Fisheries and Aquaculture Development, Lands and Natural Resources, Gender, Children and Social Protection) committed more than 30 percent of total expenditures to climate change. A review of the 2019 SDG Budget report revealed some budgetary allocations to climate change. The SDGs Budget report show that the total approved budget allocated towards targets on Goal 13 for MDAs and MMDAs combined was GH¢ 181.08 million, relative to a 2018 figure of GH¢121.69 million; coming from five different sources (DPs GH¢ 129 million; GOG GH¢ 34.5 million, IGF GH¢ 13.5 million, Statutory GH¢ 3.3 million and Other Funds GH¢ 604 thousand). It is worth noting that although there were allocations to the targets under Goal 13 at the regional level, there were no allocations at the district level.

The Green Climate Fund currently represents the largest financial contributors to the Ghana's climate change efforts. The Green climate fund is a global platform set up in response to climate change by investing in low emission and climate resilient development. It was set up to aid developing countries like Ghana to reduce greenhouse gas emission and help vulnerable groups adapt to climate change. The fund has contributed $82.4m to the country for 5 projects with 5 readiness activities and $4.8m of readiness support approved so far[15]. These projects include Leveraging Energy Access Finance (LEAF) framework, Arbaro Fund – Sustainable Forestry Fund, Ghana Shea Landscape Emission Reduction Project, Affirmative Finance Action for Women in Africa (AFAWA) project and Acumen Resilient Agriculture Fund (ARAF).

Musah-Surugu, Ahenkan, Bawole. (2018) revealed that DACF remains the most reliable source of funding for climate change adaptation at the local government level[16]. Local governments are mandated by law to budget and allocate funds to development issues such as climate change. They are only able to access donor funds through the FOAT which have a number of indicators. The study also revealed no information on annual budgetary allocations to climate change. Other sources of funding available to local government comes from other inter-governmental sources through GSOP and LESDEP which includes financial support for skills development, economic programmes and safety net pro-poor programmes at the micro level. They also noted that the entire budgetary allocation for climate change-related interventions in Ghana includes local funds emanating from Ghana's consolidated funds and local governments internally generated funds, as well as donor funds that flow principally from multilateral and bilateral sources.

[15] https://www.greenclimate.fund/countries/ghana

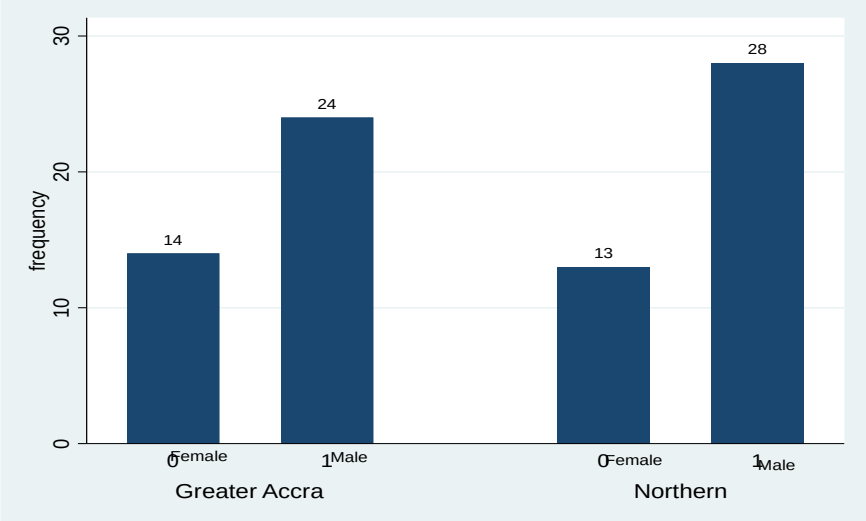
[16] Musah-Surugu, I. J., Ahenkan, A., & Bawole, J. N. (2019). Local Government Financing of Climate Change in Ghana: Politics of Aid and Central Government Dependency Syndrome. Journal of Asian and African Studies, 54(5), 619–637. https://doi.org/10.1177/0021909618812911

# 3.0 Climate Change Adaptation/Mitigation Practices and Willingness to Pay for Weather Insurance

To understand small holder farmers' perception on climate change, their climate adaptation and mitigation practices and their willingness to enrol in climate/weather insurance policies, we interviewed smallholder farmers in Asutuare, in the Shai Osu Doku District, Greater Accra region; and Savulgu in the Suvulugu district, Northern region. As depicted in figure 1 below, on the whole, 79 small holder farmers from the two districts were interviewed. A total of 38 responses were from Asutuare (14 females, 24 males) and 41 from Savulugu (13 females, 28 males).

*Figure: 1: Gender of Respondents*

.




Farming in Ghana is dominated by the aged, with most of them been males and with no or lower level of education. As evident in the ***Table 2*** the data gathered from the two districts affirm this fact that, as majority of the smallholder farmers were between the ages 40-50 years, with male farmers being the highest age group. The next highest category of age group is between 51-61 years with males still dominating.

***Table 2: Age category and Gender of Respondents***

| **Respondents' gender in age category.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Age Category** | 18- 28 | 29- 39 | 40-50 | 51-61 | 62-72 | 73-83 | 84+ | Total |
| **Gender** | | | | | | | | |
| **Female** | 1 | 5 | 9 | 11 | 1 | 0 | 0 | 27 |
| **Male** | 0 | 7 | 22 | 15 | 6 | 1 | 1 | 52 |
| | | | | | | | | |
| **Total** | 1 | 12 | 31 | 26 | 7 | 1 | 1 | 79 |

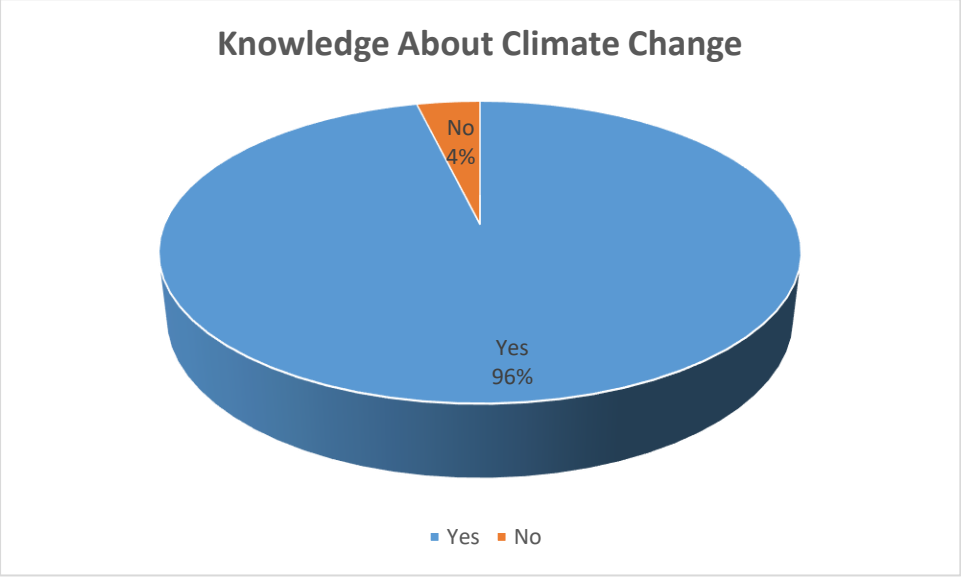
### 3.1 Small Holder Farmers Climate Change Knowledge, Adaptation and Mitigation Practices

#### *Do Small Holder Framers Know about Climate Change?*

Smallholder farmers interviewed know about climate change due to its effect on their daily activities. Change in rainfall pattern as a result of climate change is no news to smallholder farmers both in the South (Asutuare) and North (Suvulugu). Generally, the farmers interviewed have fair understanding and appreciation of issues regarding climate change and its adverse effects on agriculture production. As evidence from figure 2, only 3.8% of the small holder farmers noted they do not know about climate change. Some respondents defined climate change as changes in the weather patterns over extended period, whereas others see climate change as the variations in the climatic conditions caused by changes in rainfall patterns, floods, drought, rising temperatures etc. Adding to that, farmers disclosed that some possible causes of climate change could be cutting down of trees, fumes emitting from factories and burning of bushes into the atmosphere causes climate change. A respondent from Kpalyogu community in Savulugu had this to say in relation to what climate change is:

> *"I was told sometime back that the ozone layer would deplete due to human activities. And the depletion could contribute to a rise in the atmospheric temperature. That is exactly what we are experiencing today, to me that is climate change."*

*Figure 2:Knowledge about Climate Change*

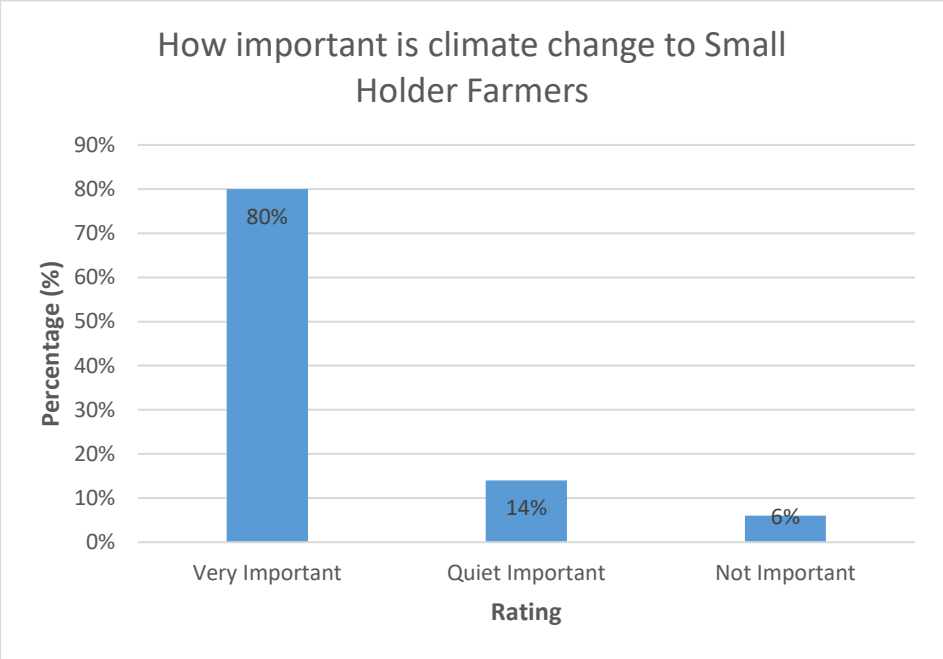



#### How Important is Climate Change to Small Holder Framers

The study also sought to find out how climate change is important to small holder farmers. Approximately 80% indicated climate change as "very important", 14% noted climate change

as “quite important”, and the remaining 6% noted that climate change is “not important”. Focus Group discussion with the farmers revealed that most of them see climate change as very important due to the adverse effect of climate change, which they have already been experiencing and thus threaten their livelihood.

*Figure 3:How Important is Cliamte Change*




***Experience of How Climate Change is Affecting Small Holder Farmers***

According to United Nations Environment Programme (UNEP, 2022), Ghana is already experiencing the impact of climate change; and that climate change mostly affects agricultural production, especially in northern Ghana. This assertion is affirmed by the findings of this study. Most of the farmers interviewed recount the loses they endure due to the adverse effects of climate change. Farmers considered the adverse impact of climate change on their livelihood as very crucial as they observe and/or experience decrease in crop yields over decades because of change in weather patterns.

Farmers also indicated in a Focus Group Discussion (FGD) that due to climate change, their farming/production timelines have been distorted (cultivation, nursing, transplanting, harvesting), poor germination of seeds due to and decrease in soil infertility. Others also said their source of finance (Bank loans) have been truncated due to default in payment of loans. This, according to the farmers is a result of low yield occasioned by the effects of climate change. A few further stated that sometimes they lose the whole farm yield. Most of the farmers that reported experiencing decrease in yield lamented lack of irrigation facilities to sustain their crops in case there is delay in rainfall. The farmers noted the corresponding effect of decrease in yields lead to food insecurity, since there are food shortages. Farmers also reported that the decrease in yields makes them economically insecure because of the reduction in their profit margins, and hence,

decline in their income, leading to reduction in the welfare status of farmers and their dependents.

> "*The changing seasons are becoming very unpredictable (our crops reduce in yield and it is increasing poverty)"* Discussant from Asutuare

> "*My income level is affected due low yield. My 1acre land used to produce 20 bags of maize, but is now producing less (4bags) due climate change."* Discussant from Kpendua community

Moreover, almost all the farmers agreed and indicated that intense heat as a result of high temperatires has reduced their labor output since they are not able to work as much as they used to earlier. It is interesting to note that FGD participants alluded to the fact that the effectiveness of fertilizer application is adversely affected due to excessive heat. The issues highlighted below were the sentiments of the farmers from the FGDs regarding the effect of climate change:

> "*Due to the rise in atmospheric temperature, the excessive heat kills our animals, it also affects egg hatching. I lost about seven (7) cows due to heat and lack of water in 2022. All dams and other source of water for animals had dried up."* Discussant from Kpendua community

***How do Small Holder Farmers adapt and Mitigate the Effect of Climate Change***

With the understanding of what constitutes climate change and its effect, small holder farmers put in place some mitigation practices that could address climate issues, especially with the changing rain patterns. Most farmers noted that they no longer engage in unnecessary cutting down of trees that could possibly be attached to deforestation. Some also noted that, they leave bushes on farmlands to decade and provide manure which address the bush fire issues. Interestly, some noted that, they educate their other colleagues' farmers that do not understand their activities influence climate change.

Individual farmers resort to various practices to adapt and/or mitigate the adverse impact of climate change. The common climate change adaptation practices farmers in both Savelugu and Asutuare adopt to cope with the effects of climate change include varying planting dates, crop diversification, diversification into non-farming activities, irrigation farming and the use of improved seedlings that can resist heat. Majority (57.5%) of the farmers mentioned that they usually change planting dates. The reason given was that raining season have change hence their decision to adjust. .Some (22.5%) also stated that they have diversified to non-farm activities due to low yield from the farm. Approximately 10.0% of the farmers cultivate improved crop varieties and/ or planting of hybrid crop varieties that are resilient to drought, pests and diseases, weeds and higher temperatures, etc.. Again,10% of the farmers also indicated they engage in crop diversification. In a quest to address some of the challenges posed by the climate change, some farmers also indicated they have been advocating for Afforestation around farmlands and Tree cutting prevention.

*I am a vegetable farmer and used to nurse onion seedling in May, however, due to the climate change impacts, i changed the onion nursing schedule to March to enable me have a good harvest.*

*I and my colleagues engage in 'lotter farming', that is, we plant during minor cropping season in Asutuare and latter travel to Ada to cultivate for same or different crop for the major cropping season.*

*We sometimes travel to adjoining towns to engage in off-farm activities to earn some income to support his farming activities.*

Other climate change adaptation strategies adopted by farmers include

- Planting of short-life cycle crops (vegetables) to help reduce the risk of crops being excessively exposed to the negative effects of climatic conditions (excessive rainfall and temperature variations)
- Rice and vegetable farmers indicated that they are now conscious and adhering to efficient water management protocols (i.e. water conservation, water harvesting and irrigation mechanisms)
- Some farmers reported that they now adopt crop rotation, planting of cover crop and shift cropping system as a coping strategy to the adverse effects of climate change.
- Participate in off-farm employment activities as a copying strategy to maintain household income consumption pattern. It was quite worrying however to hear from some farmers that some farmers have migrated to industrial cities (Accra) to engage in off-farm activities because of the adverse impact of climate change on their farming activities.
- Application of manure (fowl dropping, cow dunk etc) to improve soil fertility.
- Planting of nitrogen-fixing crops (legumes) to help replenish depleted soil nutrients.

### 3.2 Willingness to Pay for Weather insurance to Mitigate Climate Change Risk.

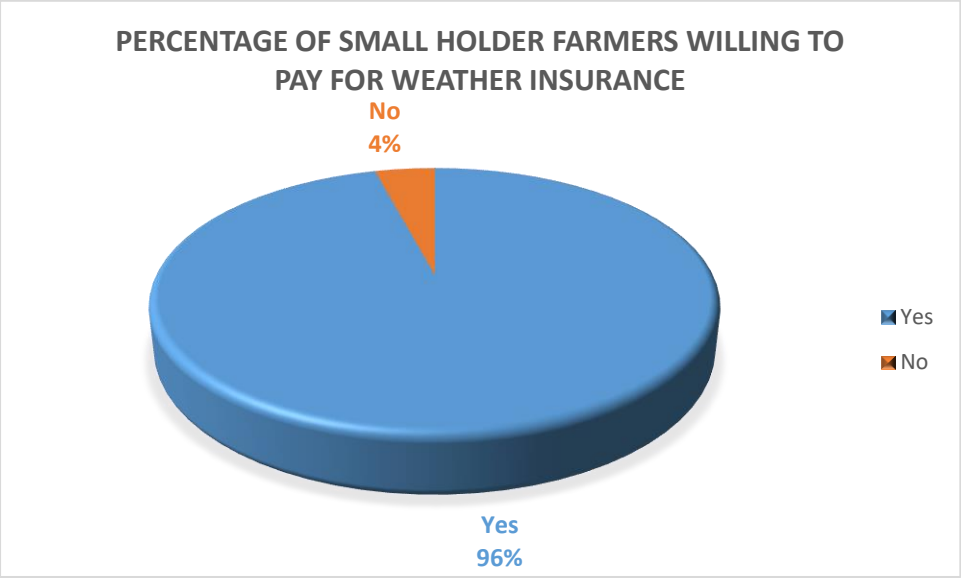
Climate change have adverse impact on farmers output and thus the welfare of their households. Weather/climate/index insurance exist to insure farmers from the vagaries of the weather/climate, and for that matter enable farmers secure their livelihood in times of adverse climatic effects like drought and flooding. The question is, are small holder farmers willing to pay a premium to enrol on any form of climate/weather insurance with the expectation that in the event of any adverse climatic effect like drought or flooding they are given a payout? Thus, responses were therefore elicited from small holder farmers about their hypothetical Willingness To Pay (WTP) for an index insurance premium to mitigate climate change risk using the contingent valuation method.

In eliciting WTP using the contingent valuation method, a realistic scenario was created where the farmers were made to assume that there is a climate/weather insurance in their area,

managed by the government through the district Agric office. They were then asked whether they will be willing to pay a premium to insure to mitigate climate change risk.

It is refreshing to note that as much as 95.99% of the small holder farmers interviewed were willing to enroll and pay a premium for climate/weather insurance, as clearly depicted in figure 4 below. The reason for their willingness to enrol is because they want to have guaranteed income and livelihood security in case of adverse climatic conditions in the near future. The few farmers (3.8%) who indicated not willing to enrol on any climate/weather insurance cited three main reasons : would rather, save or invest their money elsewhere, do not understand insurance schemes very well, just not been interested.

*Figure 4: Small Holder Framers Wiling to Pay for Weather Insurance*

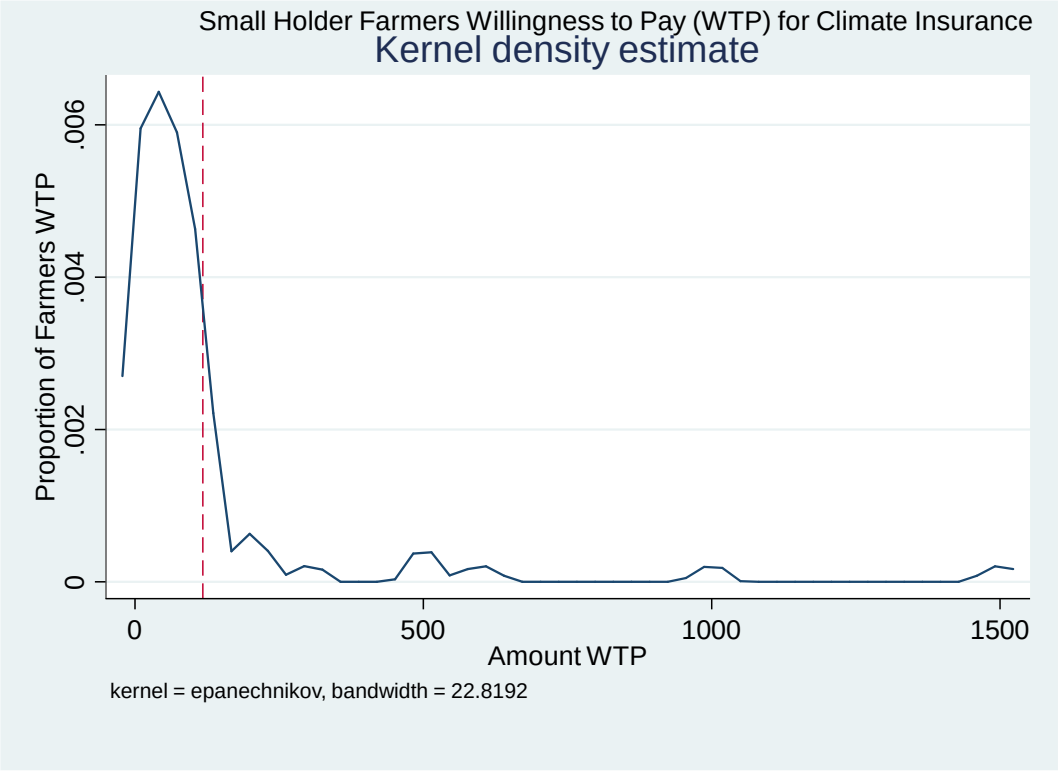



Respondents who indicated been willing to enrol on a weather insurance were then asked to indicate the maximum amount they will be willing to pay as premium in a year. In order for them not to just guess any amount, respondents were reminded to think about their income constraints and the fact that the amount they use as premium to insure will not be available to be spent on anything else. As shown in table 3, on average, small holder farmers interviewed were willing to pay approximately Ghcedis 118 yearly premium, with the minimum and maximum WTP amounts being GHC1 and GHC1,500 respectively. Only 13 percent had their maximum WTP amount been either equal to or above the average. The average willingness to pay amount is shown by the doted line in figure 5 below.

***Table 3: Summary Statistics Amount Willing to Pay for Weather Insurance***

| **Percentiles** | | **Smallest** | | |
|---|---|---|---|---|
| 1% | 1 | 1 | | |
| 5% | 2 | 2 | | |
| 10% | 5 | 2 | Obs. | 70 |
| 25% | 20 | 2 | Sum of Wgt. | 70 |
| 50% | 50 | | **Mean** | 117.6143 |
| | | Largest | Std. Dev. | 228.8402 |
| 75% | 100 | 500 | | |
| 90% | 200 | 600 | Variance | 52367.83 |
| 95% | 500 | 1000 | Skewness | 4.296274 |
| 99% | 1500 | 1500 | Kurtosis | 23.3735 |

*Figure 5: Kenel density of Amount Farmers are Willing to Pay for Weather Insurance*



# 4.0 Conclusions and Recommendations

The current desk study has revealed that Ghana has made strides in its commitment to climate change mitigation and adaption. This is evidenced in the country's commitment to the Montreal Protocol, the Kyoto Protocol and the SDG's. These actions have also contributed to the creation of the National Climate Change Policy (NCCP), National Determined Contributions (NDCs), National Adaptation and Mitigation Actions (NAMA), National Adaption Plans (NAP), National Climate Change Adaptation Strategy (NCCAS), among others.

Also, the study revealed that Ghana's climate actions are funded by multiple sources, including Government of Ghana, as well as bilateral and multilateral organisations. However, the majority of funds comes from multilateral sources. The largest contributor to the country's climate action comes from the Green Climate Fund which is currently funding projects, including the Ghana Shea Landscape Emission Reduction Project, and the Affirmative Finance Action for Women in Africa (AFAWA) project.

Additionally, the interview with small holder farmers showed that they are aware of climate change and are experiencing the adverse impacts. The farmers interviewed indicated experiencing decrease in yield as a result of climate change effects, which inadvertently lead to food and economically insecurity. The farmers adopt practices to adapt and/or mitigate the adverse impact of climate change including varying planting dates, crop diversification, diversification into non-farming activities, irrigation farming and the use of improved seedlings that can resist heat. It is also refreshing to conclude that small holder farmers are willing to enrol and pay a premium for index based climate/weather insurance to avert the adverse impact of climate change.

The following recommendations are worth considering:

- It is understandable that climate responsive budgeting is still an emerging area which is technically challenging for governments globally. It is however worth acknowledging that the success of implementation of the myriad climate change related commitments, policies and programmes largely depends on the availability of the needed financial resources. It is thus critical that the government prioritises domestic funding of climate change mitigation and adaptation programmes, by making specific yearly allocations in the national budget statement and economic policy. Metropolitan, Municipal and District Assemblies (MMDA's) should as a matter of priority also do same.

- It is also critical to institutionalize proper coordination mechanism with relevant MMDAs for effective and efficient management, tracking and reporting of climate finance inflows. Besides, climate finance information, including revenues, and expenditures should be published in a timely fashion. A standard operating tracking manual could be developed to guide the process. It is thus important that climate

expenditure data from Climate Budget Tagging (CBT)[17] is used to inform the budget process in a meaningful way.

- As the government commit to and implement climate action policies, it is important that the perspectives of the poor and vulnerable who are disproportionately affected by the climate change are considered. Their perspectives are fundamental to implementing any solutions that could have a lasting impact on their livelihoods. To this end, Civil society organisations and other development actors need to influence the country's climate policy agenda to ensure justice for communities living on the front line of climate change. CSOs should amplify the voices of marginalised communities who have done the least to cause climate change, yet, facing the most adverse impacts. This is to ensure that their concerns and experiences are put at the heart of climate change adaptation and mitigation financing.
- Government should consider encouraging and/or collaborating with the private sector to establish index insurance, since farmers have established interest and are willing to pay premium to enrol on the climate insurance to avert adverse impact of climate change.

[17] Climate Budget Tagging (CBT) is a tool for monitoring and tracking of climate-related expenditures in the national budget system. It provides comprehensive data on climate-relevant spending, enabling government to make informed decisions and prioritize climate investments.

# 6.0 References


1. Alessandro De Pinto, Ulaç Demirag, Akiko Haruna, Jawoo Koo, Marian Asamoah (2012). Climate Change, Agriculture, And Food Crop Production in Ghana. IFPRI POLICY NOTE #3 , SEPTEMBER 2012
2. Cameron C (2011) Climate change financing and aid effectiveness. Ghana Case Study. Available at: www.oecd.org/dac/environment-development/48458430
3. Ghana's 20202 Budget Statement and Economic Policy; page 98, paragraph 453
4. Musah-Surugu, I. J., Ahenkan, A., & Bawole, J. N. (2019). Local Government Financing of Climate Change in Ghana: Politics of Aid and Central Government Dependency Syndrome. Journal of Asian and African Studies, 54(5), 619–637. https://doi.org/10.1177/0021909618812911
5. Patrick Galey (2019), Climate impacts 'to cost world $7.9 trillion' by 2050. Economic Intelligent Unit https://phys.org/news/2019-11-climate-impacts-world-trillion.html
6. https://www.greenclimate.fund/countries/ghana
7. https://ebrary.ifpri.org/digital/api/collection/p15738coll2/id/130648/download
8. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
9. https://www.rapidtransition.org/resources/cambridge-sustainability-commission
10. https://itrade.gov.il/ghana/files/2020/05/Agriculture-Sector-Review.pdf
11. https://unfccc.int/kyoto_protocol
12. https://unfccc.int/resource/docs/convkp/kpeng.pdf
13. https://sustainabledevelopment.un.org/content/documents/23420Ghanas_VNR_report_Final.pdf
14. https://mofep.gov.gh/sites/default/files/news/Ghana-SDGs-Budget-Report-July-2019.pdf
15. https://mofep.gov.gh/sites/default/files/news/2020_SDGs_Budget_Report.pdf
16. https://www.adaptation-undp.org/sites/default/files/downloads/ghana_national_climate_change_adaptation_strategy_nccas.pdf