2021 EDITION

ADRA CARBON REDUCTION GUIDE

ADRA

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1. Executive summary

The inevitability of changes occurring to the climate at both global and local scales is now a well-established reality with Carbon dioxide, a key greenhouse gas that drives global climate change on the rise every day. Given its wide array of impacts on and interactions with wider developments, climate change will inevitably have considerable implications for humanitarian and development interventions. This reality is forcing many organizations globally to evaluate the potential impacts, risks, vulnerabilities, and opportunities that climate change presents. Therefore, the development of plans and actions to adjust to this new reality requires an increase in the understanding of climate change adaptation and mitigation.

This guide, therefore, provides essential introductory information on existing Global Policy frameworks on climate change mitigation and adaptation, guidelines for action, practical examples, and links to useful tools and resources such as those used in environmental and climate assessment. This, in turn, will assist ADRA Network offices in identifying ways to minimize climate change risks and optimize adaptation and mitigation strategies, as well as mainstreaming these methods into their programming and policies. Moreover, the guide discusses the linkages between development, emergency management, disaster risk reduction and climate change in the context of ADRA's work, while identifying and proposing concrete actions to reduce GHG emissions and mainstream those actions.

Although NGOs like ADRA are not viewed as polluters and are certainly not targets of regulations aimed at reducing GHG emissions, the global carbon budget indicates that everyone must reduce their climate impact, and thus needs to be part of the solution. To achieve this, ADRA needs to first understand what type of their development and humanitarian actions generates GHG emissions, and what they can do to minimize them. Based on 'what gets measured gets managed', the first step to reducing GHG emissions in ADRA network offices around the world and their projects is to measure it. This document guides how to do this, based on a step-by-step approach, and provides a customized user-friendly Carbon Calculation tool, to help ADRA network offices calculate GHG emissions from their specific office operations and project sources.

The tool is consistent with those proposed by the Intergovernmental Panel on Climate Change (IPCC) and is based on the GHG Protocol Corporate Standards approaches – the accepted international standard, having been widely implemented by GHG programs, and adopted by the International Organization for Standardization (ISO) as the basis for its ISO 14064. This guide, therefore, is intended to help ADRA network offices in the transition to low-emission and climate-resilient humanitarian and development programmes, and can also be used as a reference for where to find more detailed information on various elements and actions, regarding climate change adaptation and mitigation, to further enhance ADRA's efforts against climate change.

The Guide is organized to facilitate the understanding of climate change strategies, and provides a stepwise approach towards GHG emission measurement and reporting for an ADRA Office. The guide consequently is detailed. To make the best out of it, a user-oriented reading plan is encouraged. i.e. Each part of the document can be used independently as a resource or can be used as sequential guidance detailing the process of completing a comprehensive climate change adaptation and mitigation plans and actions for an ADRA office. Nonetheless, all readers will find it useful that they have read parts 5 and 6 of the document, as this forms the heart of this guide.

In this regard the guide is divided into 8 parts as highlighted below;

Part 1: This section summarizes the document in such a way that the reader can rapidly become acquainted with the large body of material whilst easily directing them to specific sections of interest.

Part 2: Outlines ADRA strategic direction for how it will transition into a carbon-neutral network. It gives the reader the bigger picture necessitating the transition as well as the need for proper guidance as outlined in this guide.

Part 3: This section provides the reader with a view of the context of climate change within which the ADRA network is currently operating. Further, it details how ADRA is working around the challenges posed by climate change at a strategic level.

Part 4: This section provides brief literature on climate change and carbon offset options that are available in the market. It further provides basic concepts, principles, procedures, and links to useful tools of good practice that can be implemented at an ADRA office with regards to climate change mitigation and adaptation; linkages between Development, Emergency Management, Disaster Risk Reduction, and Climate Change; mainstreaming CCA and CCM into ADRA policies and programs.

Part 5: This section explains how to estimate the amount of carbon emissions from ADRA office operations. It walks the reader through six simple steps an ADRA office can take to measure its office's carbon dioxide (CO_2) emissions. The section is also embedded with a customized $C0_2$ tool, designed to help ADRA offices calculate their admin emission footprints, whilst guiding how to both collect the requisite data needed for the tool and how to complete the tools' workbooks after the data has been collected. Additionally, suggestions and examples of sustainable carbon reduction practices that ADRA offices could implement within their office establishments towards reducing their office admin CO_2 emissions footprints, are also included in this section.

Part 6: This section provides practical suggestions and examples of sustainable carbon emissions reduction practices, that ADRA can implement in reducing CO_2 emissions associated with its project activities. It also introduces the user to a set of simple, user-friendly, web-based calculation tools titled the 'AFOLU Carbon Calculator (ACC)' adopted from the USAID, that will be used in estimating ADRA field-based activities GHG emission. The tool is used to complement the ADRA office-based calculation tool.

Part 7: This section introduces the user to key concepts and background information on climate proofing, and later guides the user through a stepwise approach for climate proofing process, necessary in incorporating climate change concerns into ADRA's development programme/project designs and implementation. Therefore, this part ought to help ADRA in reviewing their project/programme portfolio as well as their proposals under development and decide which projects/program requires climate proofing. The section also highlights examples of some of the measures that an ADRA office can take to climate proof projects across its 3 key thematic areas.

Part 8: This is the last section of the document, and it provides the user with quick links to useful tools and guides, that are included within the document text.

2. Visions, aims, objectives

Vision: ADRA as a GHG neutral Network of offices, where all ADRA offices adopt greener and sustainable operations, and where decisions are taken based on the risk knowledge and with low carbon development outcomes in mind.

Aim: To provide all offices within ADRA Network a guideline, to enable transfer into a nature-positive and carbon neutral organization.

Objectives:

- To enhance ADRA Network country offices level capacity to calculate their carbon footprint, reduce their current office and project activity emissions, and neutralize what they cannot reduce.
- To assist and provide guidance in mainstreaming climate change adaptation and mitigation, into all ADRA Network development and humanitarian programming.

3. Context

3.1 ADRA operations and Climate Change

ADRA is a non-governmental humanitarian relief and development agency. ADRA's current operations touch millions of lives in more than 118 countries around the world, regardless of their ethnicity, political affiliation, gender, or religious association. By partnering with local communities, organizations, and governments, ADRA can deliver culturally relevant programs and build local capability to alleviate suffering, poverty, and oppression by helping people build secure, productive, and just communities. Nonetheless, the current global climate crisis poses extreme challenges to the people it assists, thereby representing one of the challenges affecting ADRA's humanitarian and development actions.

This is further confirmed by the IPCC Special Report on the Global Warming, which clearly outlines the humanitarian impacts of climate change. As such, the need for taking immediate and bold action on climate change is increasingly being recognized. Limiting the global temperature rise is, however, not a responsibility of national governments alone. Every citizen and every institution can contribute – and has an obligation to do so. As an organization, ADRA has acknowledged its role in the need to act, demonstrating the desire to provide sustainable development and humanitarian actions aligned to the Global Net Zero Emissions goals, to mitigating climate change and protecting the environment.

Additionally, there is increasing recognition among humanitarian and development actors, in the importance of adaptation to climate change and resilience. The issue features prominently across all major post-2015 frameworks i.e. the Sustainable Development Goals (SDGs), the Sendai Framework for Disaster Risk Reduction (Sendai Framework), the Paris Agreement on Climate Change as further elucidated in the subsequent chapters of this guide. Aligned to these global trends and in accordance with the ADRA Strategic Framework, ADRA has leveraged through its Resilience Policy to ensure that it considers resilience and disaster risk reduction as a key connector between its humanitarian response and well-being, across its key thematic areas of intervention:

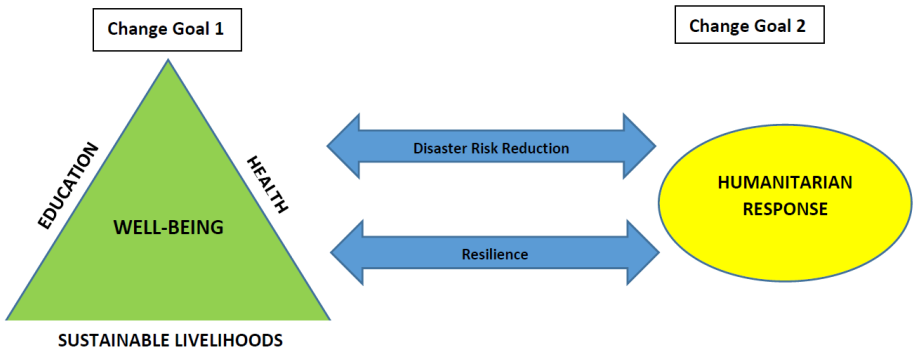

Figure 1 ADRA Strategic Framework

4. Climate Change Strategies and Policy Guidelines

In the world of finance and trading, a "black swan" is an unpredictable event that is beyond what is normally expected of a situation and has potentially severe consequences. A black swan is an extremely rare event with severe consequences. Black swan events can cause catastrophic damage to an economy, and because they cannot be predicted, they can only be prepared for by building robust systems. Reliance on standard forecasting tools can both fail to predict and potentially increase vulnerability to black swan, by propagating risk and offering false security. [1]

Some economists today define climate change as a swan of a different color: a green one. "Green Swan" concept of climate change is a new type of systemic risk that involves interacting, nonlinear, fundamentally unpredictable, environmental, social, economic and geopolitical dynamics, which are irreversibly transformed by the growing concentration of greenhouse gases in the atmosphere". Climate catastrophes could pose an existential threat to humanity, as increasingly emphasized by scientists.[2] The IPCC Special Report on Global Warming of 1.5°C IPCC 2018 [3], indicates that beyond 2°C of global warming, the chances of reaching tipping points (such as a melting of the permafrost) become much more likely, which could in turn trigger multiple chain reactions between different ecosystems (See figure 2).

Figure 2 Risks of tipping points with increased global warming, IPCC 2018.

A climate tipping point is a critical threshold when global or regional climate changes from one stable state to another stable state. The tipping point event may or may not be reversible[4]. Estimates of when certain tipping point cascades could be triggered are regularly reassessed by the scientific community. Whether these tipping points are reached, and if so, by

[1] https://www.investopedia.com/terms/b/blackswan.asp
[2] https://academic.oup.com/bioscience/article/67/12/1026/4605229
[3] https://www.ipcc.ch/sr15/chapter/spm/
[4] https://www.researchgate.net/publication/5592977_Tipping_Elements_in_the_Earth's_Climate_System

what year, is uncertain mainly because future emissions pathways are uncertain. If greenhouse gas emissions continue at their current rate, tipping points associated with a 1.5°C temperature increase will be reached by 2050, and tipping points associated with 3°C by 2100[5]

For instance, a recent study Bamber 2019 [6], found that due to accelerated melting in Greenland and Antarctica, global sea levels could rise far more than predicted by most studies so far, and potentially leading to other tipping cascades that have not been anticipated. Other studies find that rainforests which act as a critical climate stabilizer by absorbing and storing CO_2, may be losing their ability to do so faster than expected[7], which could trigger important increases in global warming and other cascades". [8] The timing and nature of impacts of climate change are still highly uncertain, but there is certainty among scientists, about the need for ambitious actions, despite prevailing uncertainty about what exactly the impacts on earth systems will be. "Most scientists would agree today that mitigating and adapting to climate change, requires major transformations in the ways our global society functions and interacts with natural ecosystems". [9]

"In our view, the evidence from tipping points alone suggests that we are in a state of planetary emergency: both the risk and urgency of the situation are acute. Figure 3 below shows some of the likely impacts and tipping points associated with different warming scenarios. We argue that the intervention time left to prevent tipping could already have shrunk towards zero, whereas the reaction time to achieve net zero emissions is 30 years at best. Hence, we might already have lost control of whether tipping happens. The stability and resilience of our planet is in peril. International action — not just words — must reflect this".[10] "Avoiding this requires immediate and ambitious action towards a structural transformation of our economies, involving technological innovations that can be scaled but also major changes in regulations and social norms".[11]

[5] https://documents1.worldbank.org/curated/en/519821547481031999/The-World-Bank-Groups-Action-Plan-on-Climate-Change-Adaptation-and-Resilience-Managing-Risks-for-a-More-Resilient-Future.pdf
[6] Ice Sheet Contributions to Future Sea-Level Rise from Structured Expert Judgement
[7] https://www.nature.com/articles/s41561-019-0404-9
[8]https://www.bis.org/publ/othp31.pdf
[9] https://academic.oup.com/bioscience/article/67/12/1026/4605229
[10] https://www.nature.com/articles/d41586-019-03595-0
[11] https://www.bis.org/publ/othp31.pdf

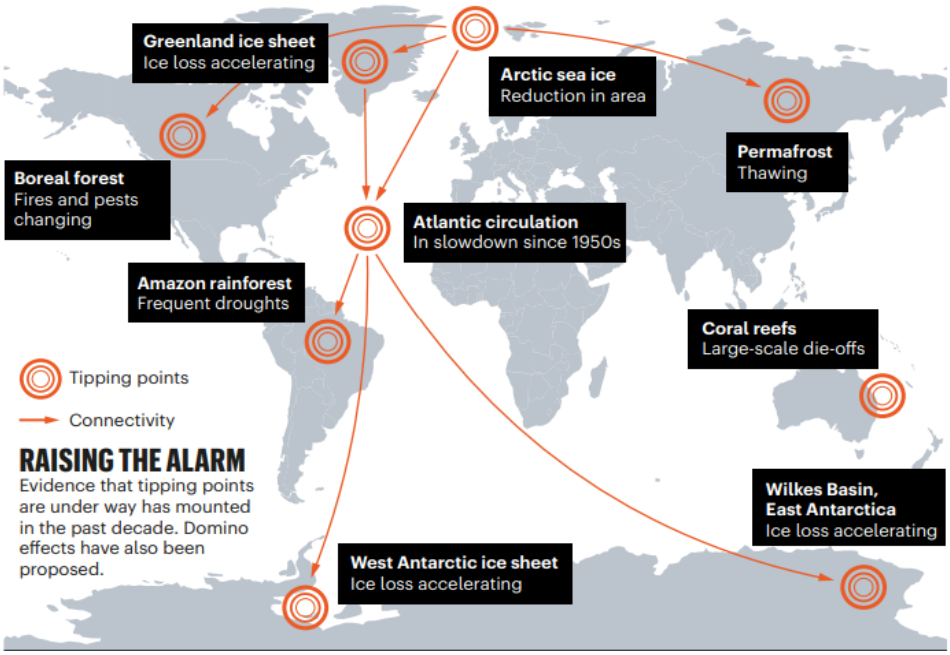

Figure 3 Climate Tipping Points - Too Risky to Bet Against [12]

The 2015 United Nations Climate Change Conference (COP21), and the resulting Paris Agreement among 196 countries to reduce GHG emissions on a global scale was a major political achievement. Under the Paris Agreement UNFCC 2015 [13] signatories agreed to reduce greenhouse gas emissions "as soon as possible", and to do their best to keep global warming "to well below 2 degrees" Celsius (2°C), with the aim of limiting the increase to 1.5°C. GHG reduction targets are set by each country through Nationally Determined Contributions (NDCs). Even though the agreement itself is legally binding, no enforcement mechanism exists, and as such, the GHG reduction targets committed in the NDCs are only voluntary.

One means of bringing down global carbon emissions and drive investment into cleaner options has been carbon pricing. There has been a momentum of interest growing among countries and businesses to put a price on carbon pollution. So, what does it mean to put a price on carbon?

There are two main types of carbon pricing: **Carbon Taxes** and **Emissions Trading Systems (ETS)**

- A **carbon tax** directly sets a price on carbon by defining a tax rate on greenhouse gas emissions or – more commonly – on the carbon content of fossil fuels. It is one of the most preferred policies, as the idea is that such a tax would create an incentive for economic agents to lower emissions by switching to more efficient production processes and consumption patterns. By this framing, the government would have little to do in the process of decarbonizing the economic system. The theory is that the needed transition would mostly be driven by firms and households, whose decentralized decisions would be geared towards low-carbon technologies thanks to carbon pricing.

- An **ETS** – sometimes referred to as a cap-and-trade system – caps the total level of greenhouse gas emissions and allows those industries with low emissions to sell their extra allowances to larger emitters. By creating supply and demand for emissions allowances, an ETS establishes a market price for greenhouse gas emissions.

[12] https://media.nature.com/original/magazine-assets/d41586-019-03595-0/d41586-019-03595-0.pdf
[13] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

The cap helps ensure that the required emission reductions will take place to keep the emitters (in aggregate) within their pre-allocated carbon budget.[14]

It is worth noting that Carbon markets exist under 2 different markets i.e. **Mandatory (compliance) Schemes** and **Voluntary Programs** as described below;

- **Compliance markets** are created and regulated by mandatory national, regional, or international carbon reduction regimes e.g. the Clean Development Mechanism under the Kyoto Protocol, the European Union Emissions Trading Scheme (EU-ETS), and the California Carbon Market. [15] In these markets, each ton of CO_2 is measured in carbon credits or CERs (Certified Emission Reductions). These credits or CERs are generated during the implementation phase of a project; and are issued once the reduction has been credited. Additionally, projects wishing to offer their CERs in the market will need to have their emission reductions validated by Designated Operational Entities (validators and verifiers) and registered by the Clean Development Mechanism (CDM) Executive Board, to ensure that real and measurable emission reductions are achieved.
- **Voluntary markets**, function outside of compliance markets and enable companies, NGOs, and individuals to purchase carbon offsets voluntarily, with no intended use for compliance purposes. Voluntarily carbon markets that exist include; Gold Standard, Verra, Plan Vivo, etc. ADRA as an NGO can produce or purchase credits under these voluntary markets. Unlike the compliance offset market credits which may in some instances be purchased by voluntary or non-regulated entities, for the voluntary offset market credits, unless they are explicitly accepted into the compliance regime, they are not allowed to fulfill compliance market demand."[16]

In reality, there are serious problems with implementing an effective carbon pricing initiative, especially with the carbon tax. Nonetheless, there has recently been a tremendous increase in carbon pricing initiatives globally. 2019 saw the largest number of carbon pricing initiatives being launched in a single year, with ten initiatives entering into force—equal to the total number of carbon pricing initiatives being launched in the previous three years combined. In the same year, South Africa became the first country in Africa to put a price on carbon, while Singapore's carbon tax also marked the first time a country in Asia introduced a carbon tax. There are currently 61 carbon pricing initiatives in place or scheduled for implementation, consisting of 31 ETSs and 30 carbon taxes (See figure 4), covering 12 gigatons of carbon dioxide equivalent ($GtCO_2e$) or about 22% of global GHG emissions.[17]

[14] https://www.worldbank.org/en/programs/pricing-carbon

[15] https://www.climatetrade.com/voluntary-market-and-mandatory-carbon-credit-market/

[16] https://www.offsetguide.org/understanding-carbon-offsets/carbon-offset-programs/mandatory-voluntary-offset-markets/

[17] https://openknowledge.worldbank.org/bitstream/handle/10986/33809/9781464815867.pdf

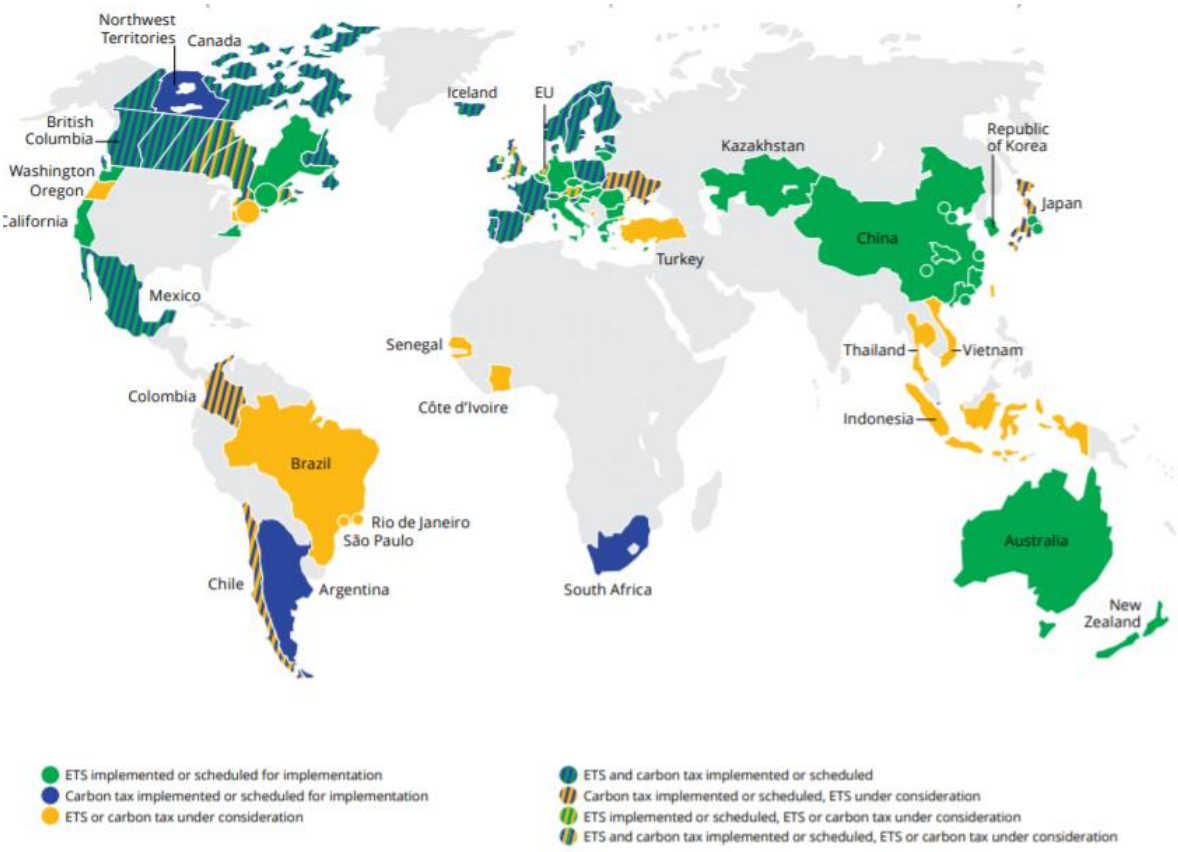

Figure 4 Global Carbon pricing initiatives

This has been further reflected in the high carbon prices in the EU carbon market, where carbon price hit a record high of above 50 euros per tonne as on Tuesday (May 4th 2021), a key milestone in what analysts say is likely a long-term climb towards the price levels needed to trigger investments in innovative clean technologies.[18] However, despite ongoing developments, the High-Level Commission on Carbon Prices estimated that carbon prices of at least US$50–100/$tCO_2$ by 2030 are required to cost-effectively reduce emissions in line with the temperature goals of the Paris Agreement 21. On the other hand, the International Energy Agency (IEA) Sustainable Development Scenario, states that a carbon price ranging between US$75/$tCO_2$ and US$100/$tCO_2$ is needed to stay on track with a Paris-compatible trajectory.[19]

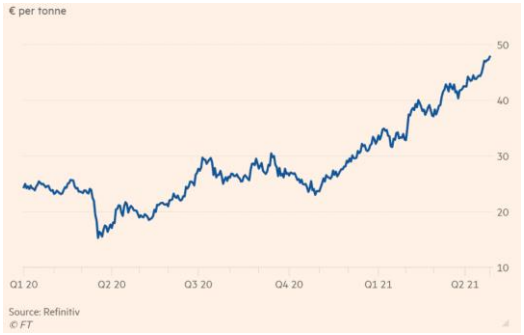

Figure 5 EU Carbon trading price surge (May 4 2021)

[18] https://www.ft.com/content/2b965427-4fbc-4f2a-a14f-3be6019f0a7c
[19] https://www.iea.org/reports/world-energy-outlook-2019

Therefore, it is evident that the approach cannot only be to treat climate change merely as a market failure by carbon pricing but rather, profound issues need to be addressed - a deep transformation of our lifestyles, prioritizing long-term ethical choices over short-term economic considerations, international coordination for the common good, among other issues of uncertainty and tremendous risks**.** This needs to be done system-wide, identifying the transformation requirements for the social-technical system we are locked in, with its elements, including technology, regulations, user practices and markets, infrastructure, maintenance networks, and supply networks, etc.

An example, is the adoption of a global market-based measure for aviation emissions (Carbon Offsetting and Reduction Scheme for International Aviation – more commonly known as CORSIA), by the member states of the International Civil Aviation Organization (ICAO). As the name suggests, CORSIA is a global offsetting scheme, whereby airlines and other aircraft operators will offset any growth in CO_2 emissions above 2020 levels (it is anticipated that CORSIA will mitigate around 2.5 billion tonnes of CO_2 between 2021 and 2035, which is an annual average of 164 million tonnes of CO_2).

As such, airlines and other aircraft operators will be subject to offsetting requirements, which will be determined by the CO_2 they emit on flights subject to offsetting. This will include all aircraft operators, from large passenger airlines, cargo airlines, business aviation, and even private airlines. Additionally, this means that aviation's net CO_2 emissions will be stabilized, while other emissions reduction measures such as technology, sustainable aviation fuel, operations, and infrastructure options within the industry will be pursued.[20]

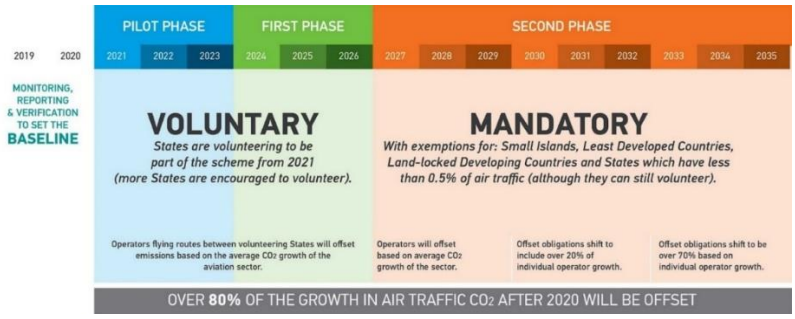

Figure 6 CORSIA Aviation offsetting scheme implementation chart

Given the urgency of the climate change situation – and notably the long-term irreversibility of climate-related changes – one cannot possibly entirely reconceive the current climate system from scratch. Therefore, in addition to the market-oriented approaches, it is more relevant that ADRA network offices take part in improving the current climate-related changes, through the remediation strategies described in the sections below;

4.1 Climate Change Mitigation – CCM

Climate change mitigation (CCM) addresses the causes (accumulation of greenhouse gases in the atmosphere). According to United Nations Intergovernmental Panel on Climate Change (IPCC) Working Group III-1 [21], climate change mitigation is achieved by limiting or preventing greenhouse gas emissions and by enhancing activities that remove these gases from the atmosphere. The climate change mitigation activities contribute "to the objective of stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the

[20] https://aviationbenefits.org/environmental-efficiency/climate-action/offsetting-emissions-corsia/corsia/corsia-explained/#:~:text=As%20the%20name%20suggests%2C%20CORSIA,CO2%20emissions%20above%202020%20levels.&text=CORSIA%20helps%20aviation%20towards%20its,neutral%20growth%20from%202020%20onwards.

[21] https://www.ipcc.ch/working-group/wg3/

climate system by promoting efforts to reduce or limit GHG emissions or to enhance GHG sequestration", according to Article 2 of the UNFCCC. [22]

According to IPCC, mitigation of climate change is defined as a "technological change and substitution that reduces resource inputs and emissions per unit of output with respect to climate change [23]. Therefore, in simple terms, it is a matter of both reducing and limiting GHG emissions (Both at ADRA offices /ADRA projects) as well as, Sequestrating remaining ADRA emissions through project activities. Sequestration is the opposite of emission – i.e. the long-term removal of carbon dioxide from the atmosphere. In 2018, the Intergovernmental Panel on Climate Change (IPCC) published the Special Report on Global Warming of 1.5°C. The report details the impacts of a 1.5°C temperature rise and proposes mitigation strategies to remain below the 1.5°C target. It will require lowering global carbon dioxide (CO_2) emissions in 2030 by 45% compared to 2010 and will require net zero emissions around 2050. [24] The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all. The Paris Agreement target which aims at net zero emissions around 2050, also happens to be the EU's 2050 long-term strategy. As of April 1, 2020, the strategy had already taken effect in some EU countries such as Denmark, France, and Sweden, who had already built on this pledge and enshrined a net zero CO_2 emissions target into legislation.[25]

ADRA is committed to working towards reducing its GHG emissions in becoming a net-zero organization and to publish its lessons learned, as part of its focus to minimizing impacts on the climate from its operations. As such, this requires an ADRA office to compile a greenhouse gas inventory each year, with a standardized method that is employed by all ADRA offices. This can be made possible by adopting the ADRA GHG Emission calculation tool, as used in the implementation of the Carbon Neutral Strategy Pilot Project, across 4 ADRA country offices (i.e. ADRA Germany, Netherlands, Sweden, and Madagascar). This customized tool is created to facilitate and standardize GHG inventories of ADRA offices anywhere in the world. As such, it provides standardized GHG inventories of ADRA offices, that will help an ADRA office in preparing a GHG inventory and calculating the resulting GHG emissions, thereby representing a true and fair account of their emissions (more details regarding the tool can be found in chapter 5).

From the above, the principal fields for ADRA climate mitigation actions include:

- Climate Advocacy
- Reducing/limiting GHG emissions at ADRA network offices
- Reducing/limiting GHG emissions and/or sequestering GHGs in ADRA projects

The focus of this study is more on the technical aspects of the last two fields (as expounded explicitly in section 5 and 6 of the report), as well as on climate change adaptation and climate proofing of projects, which is a more integrated approach evaluating both, potential l CCM and CCA measures of an ADRA project. Nevertheless, below is a brief on climate advocacy options, that can be adopted by an ADRA office, as part of its climate mitigation actions

- **<u>Climate Advocacy</u>**

ADRA as a faith-based organization (FBO) and operating worldwide can make a significant contribution in mitigating climate change not only through direct measures to reduce carbon footprints in-network offices and projects but also through advocacy, education, and campaigning. The voice of FBOs, in general, has increased over the past few years. ADRA

[22] https://unfccc.int/resource/docs/convkp/conveng.pdf
[23] https://www.ipcc.ch/report/ar4/wg3/
[24] https://www.ipcc.ch/sr15/chapter/spm/
[25]https://eciu.net/netzerotracker

is appreciated for its global network, with a rooted presence at the national and community level and, as an internationally operating FBO, holds an ideal position for effective climate advocacy.

The Paris Agreement (PA), the Sendai Framework for Disaster Risk Reduction, and the Sustainable Development Goals (SDGs) were all agreed in the same year, 2015. They all mutually underline the necessity of a transition towards a sustainable and climate resilient future. Key among them for this report's climate change mitigation section is the Paris Agreement - which drives collective action toward a zero-carbon and climate-resilient future. As such, ADRA project programmers ought to ensure that they incorporate two of the three central instruments of the Paris Agreement i.e. the Intended Nationally Determined Contributions (INDCs, 2015) and the Long-term Strategies (LTSs, 2016), during the early development stages of their climate change mitigation actions.

INDCs are the primary means for governments to communicate internationally the steps they will take to address climate change in their own countries. INDCs reflect each country's ambition for reducing emissions, considering its domestic circumstances and capabilities, while LTSs, is a framework for iterative planning on the national level, but with different time frames. LTSs focus on a low carbon future in 2050 and seeks to align short-term policymaking with longer-term goals. Only a smaller number of LTSs have been submitted so far, but it was expected that developing counties' LTSs would have been submitted by 2020 and that they would integrate the adaptation component more fully.[26]

However, the 2020 COVID-19 health crisis has delayed some countries' efforts in communicating and/or updating their long-term climate strategies. As of November 2020, only 20 Parties (representing 40 countries and 27 percent of global emissions [27]) had formally communicated their long-term strategies to the UN Framework Convention on Climate Change (UNFCCC).[28] The 2020 COVID-19 health crisis rendered it challenging for some countries to initiate a LT-LEDS process and/or to develop a new/updated their NDC. This was because countries' immediate response to the pandemic had resulted in redirecting efforts and resources to address the needs of national health systems.[29] Moreover, the postponement of important international conferences and events on climate change, including the COP26, also contributed to delays in the LT-LEDS processes, as well as the INDC. Additionally, the logistical implication of the partial or total lockdown and travel restrictions imposed by governments around the world, also significantly impacted staff capacity to implement these processes.

The above-mentioned documents to be submitted by each country are relevant and useful to ADRA project coordinators, who would like to integrate climate overall objectives and prioritize mitigation options into their projects. It is worth noting that the change, however, needs to be done on program level. As such, to ensure its success, ADRA management must take it as a priority, which if not, these will just be single efforts of project coordinators. "As people of faith, we are called to care for creation and share the resources of the earth sustainably and equitably. We call for a change from the current model of development and economics to one that is sustainable, equitable and prioritizes intergenerational equity and the rights of the most vulnerable, including the indigenous people".[30] It is therefore important, that ADRA climate advocacy work is guided by the principles of climate justice.[31]

There are different types of advocacy approaches a local ADRA office could look at, e.g.

[26] http://sdg.iisd.org/news/unfccc-undp-highlight-long-term-strategies-to-meet-climate-goals/
[27] https://www.climatewatchdata.org/lts-explore?showEUCountries=false
[28] https://www.wri.org/insights/shaping-cop26-decision-long-term-climate-strategies
[29] https://www.oecd.org/environment/cc/LEDS-NDC-linkages.pdf
[30] https://web.facebook.com/watch/?v=1711744365545106
[31] https://unctad.org/system/files/official-document/ngls20092_en.pdf

- As a kind of watchdog, it could focus on critically observing the level of ambition and effectiveness of the Nationally Determined Contributions (NDC) implementation, in comparison with specific assessment criterion, as well as setting up of climate action campaigns;
- A more technical and cooperative approach, that could be to focus on the provision of technical guidance and capacity building of local organizations towards supporting a more ambitious implementation of the NDC, as well as, generating evidence from practical experience on the ground to feed into national program development and policy analysis on climate change mitigation.
- And the most cooperative role would be, to act as a bridge-building organization, focusing on the facilitation of constructive dialogues, and bringing together different stakeholders as well as partnerships with humanitarian and development peers, other faith networks, and like-minded advocacy groups.

4.2 Climate Change Adaptation – CCA

Climate change adaptation can be understood as an action or combination of actions that reduce the vulnerability of an individual, household, population group, infrastructure, or system (e.g. urban area) to the adverse impacts of climate change[32]. Some impacts of climate change are already observable, and there is broad scientific consensus that further change will occur. Consequently, to respond to the adverse impacts of climate change currently taking place across many countries, while at the same time anticipating more impacts, UNFCCC upholds that adaptation is paramount.

The science-policy experts, in the Feb. 8, 2007 issue of Nature (Adaptation to Global Climate Change Is an Essential Response to A Warming Planet), say adapting to the changing climate would go further in securing a future for humans on a warming planet than just cutting gas emissions. "New ways of thinking about, talking about and acting on climate change are necessary if a changing society is to adapt to a changing climate.[33]. Even if the world makes a significant reduction in greenhouse gas emissions, the lag in the climate system means that we are faced with decades of climate change due to the emissions already put into the atmosphere (National Climate Change Adaptation Framework). Adaptation is therefore, a necessary complement act to reduce greenhouse gas emissions, and it remains one of the most important climate response measures.

The Paris Agreement (Article 7; part2) acknowledges this by declaring that, “Parties recognize that adaptation is a global challenge faced by all with local, subnational, national, regional and international dimensions and that it is a key component of and makes a contribution to the long-term global response to climate change to protect people, livelihoods and ecosystems, taking into account the urgent and immediate needs of those developing country Parties that are particularly vulnerable to the adverse effects of climate change.”[34]

The third central instrument of the Paris Agreement that ADRA project programmers ought to make use of during early development stages for their climate adaptation projects, is the National Adaptation Plans (NAPs, 2015-) and National Adaptation Programme of Action (NAPA, in the Least Developing Countries - LDCs). Just like the LTs, NAPs/NAPAs are frameworks for iterative planning on the national level, covering the medium and the long-term (about five to ten years). The objectives of NAPs/NAPAs are to reduce vulnerability to the impacts of climate change and to integrate adaptation into all levels of development planning.[35] -

[32] https://www.ipcc.ch/report/ar4/syr/
[33] https://www.sciencedaily.com/releases/2007/02/070207171745.htm
[34] https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf
[35] https://sustainabledevelopment.un.org/index.php?page=view&type=30022&nr=126&menu=3170

Central to adaptation is the notion of adaptive capacity. Although frequently used interchangeably with the term resilience, adaptive capacity denotes the ability of a system to evolve in order to accommodate shock and stress or to expand the range of variability with which it can cope.[36] In the context of climate change, IPCC (2001) defines adaptive capacity as the actual ability of a system to adjust (or adapt) to climate change, variability, and extremes, moderating potential damage, taking advantage of opportunities, coping with consequences, as well as expanding its coping range under existing climate variability or future climate conditions.[37]

The presence of adaptive capacity is a necessary condition for the design and implementation of effective adaptation strategies to reduce the likelihood and the magnitude of harmful outcomes resulting from climate change.[38] Important to note is that adaptation is not accomplished in a single intervention. Rather, it is a continuum requiring an overarching approach, that incorporates interventions that range from those that address underlying drivers of vulnerability, to those designed exclusively to respond to climate change impacts.[39]

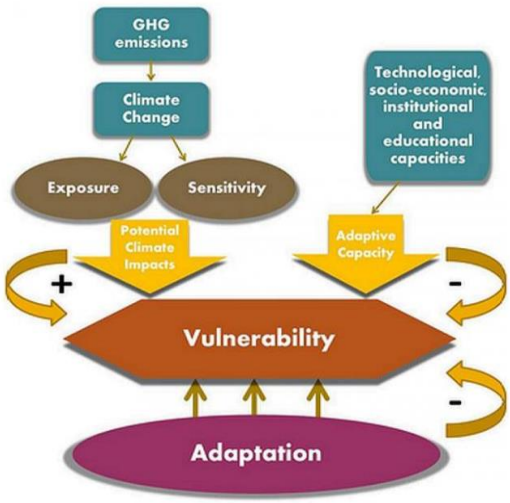

Figure 7 Mechanisms of climate change in reducing vulnerability [40]

The vulnerability of a system depends on its exposure and sensitivity to changes, and on its ability to manage these changes.[41] Climate change adaptation can therefore be enhanced by;

i. Altering exposure
ii. Reducing sensitivity of the system to climate change impacts and
iii. Increasing the adaptive capacity of the system.[42]

From the above, the principal fields for ADRA climate adaptation actions could include:

- Promoting the establishment of capacities institutions needed to implement community adaptation practices, such as Community Disaster Risk Reduction Committees (CMDRR).
- Developing appropriate metrics and indicators, to assess whether different project interventions/efforts at better integrating climate risks and adaptation considerations have proved effective

[36] https://www.worldscientific.com/doi/pdf/10.1142/9781860945816_fmatter
[37] https://www.ipcc.ch/site/assets/uploads/2018/03/WGII_TAR_full_report-2.pdf
[38] https://www4.unfccc.int/sites/NAPC/Country%20Documents/General/apf%20technical%20paper07.pdf
[39] https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/5860.pdf
[40] https://climatepolicyinfohub.eu/climate-change-adaptation-needs-barriers-and-limits
[41] https://www.ipcc.ch/site/assets/uploads/2018/03/WGII_TAR_full_report-2.pdf
[42] http://www.oecd.org/environment/cc/44887764.pdf

- Incorporating considerations for environmental screening in development and emergency projects, through Environmental Impact Assessment (EIA)- that encourages the inclusion of matters such as waste management and pollution control, biodiversity conservation, sustainable land management, and climate change in development assessment and decision-making, as well as Rapid Environmental Assessment (REA) – that provides a means to define and prioritize potential environmental impacts in disaster response situations. Examples of environmental assessment tools that an ADRA office could adopt for use are provided in Chapter 4 (section 4.4).
- Mainstreaming and integrating climate change adaptation options into all development and relief interventions. These options include a wide range of actions that are summarized in the table below, and are organized into three general categories: **Structural/Physical**, **Social**, and **Institutional.**

Category		Example of action options.
Structural/Physical	Technological	Water saving technologies, agronomic adaptation responses (e.g. agroforestry, conservation agriculture), early warning systems, new crops and animal varieties, renewable energy technologies (e.g. solar based systems)
	Ecosystem Based	Afforestation and reforestation, wetlands and floodplain conservation, community-based natural resource management, conservation and replanting of mangrove.
Social	Educational	Gender equity in education, extension services, knowledge sharing and platforms, communication through media, research, and social learning.
	Informational	Hazard and vulnerability maps, and early warning systems information that integrates indigenous climate observations.
Institutional	Economic	Saving groups, cash transfer and disaster contingency funds.
	Policies and programs	Disaster planning and preparedness, community-based adaptation, sustainable forest management, integrated coastal zone management, integrated water resource management

Table 1 Climate Adaptation action options

Elaborate adaptation categories and options are further described in chapter 14 of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.[43]

- Gender mainstreaming by promoting strong participation of women at all levels of resilience-focused project interventions: Recognizing their role as household and community resource managers and promoting their active involvement in project activities, will ensure the success and sustainability of ADRA projects adaptation achievements.
- Promote the spirit and application of “leave no one behind”, by ensuring that those who are most marginalized and at risk of being left behind such as persons with disabilities are included in decision-making, planning, and implementation of community adaptation activities. This could be achieved through initiatives such as Disability Inclusive Disaster Risk reduction (DiDRR) approaches. DiDRR is underpinned by the concept of “universal design”,

[43] https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap14_FINAL.pdf

wherein environments, services and information are designed to be as accessible and usable by all persons to the maximum extent.[44]

- Ensuring that ADRAs' projects have a detailed understanding of local communities' livelihoods and vulnerabilities: knowing the assets that comprise peoples' livelihoods and the factors (including climate related risks) that shape vulnerability to ensure the design of appropriate and locally relevant project activities, that address both the immediate and long-term climate change adaptation & mitigation priorities.
- Promotion of adaptation & mitigation advocacy. This can include developing and piloting tools and methods; collecting, analyzing, and utilizing data and statistics; facilitating information exchanges and communication; preparing adaptation & mitigation manuals and guidelines (an example is the current guide); and establishing networks and partnerships.

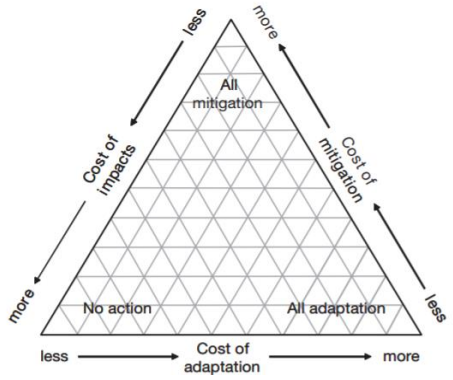

Figure 8 Schematic overview of inter-relationship between Adaptation, mitigation, and impacts.[45]

- Implementation of stand-alone adaptation & mitigation projects and programs designed to address specific climate change-induced problems such as building climate monitoring and impact assessment capacities, diversifying livelihoods and/or developing entirely new sustainable production systems that are not only are adapted to the changing climate (climate smart), but are also environmentally-friendly, in that, they promote the use of renewable energy (solar irrigation kits), prevent air and water pollution, and promotes biodiversity conservation.

4.3 Linkages between Development, Emergency Management, Disaster Risk Reduction, and Climate Change

This section describes Development, Emergency Management, Disaster Risk Reduction, and Climate Change in terms of their definitions, objectives, and underlying concepts. Each item is described individually, and a concluding section discusses the actual and/or potential linkages.

- **Development**

According to the Agenda for Development(RES/51/240), development is a multidimensional undertaking to achieve a higher quality of life for all people.[46] Economic development, social development, and environmental protection are interdependent and mutually reinforcing components of sustainable development. While humanitarian aid is designed to save lives and alleviate suffering during and in the immediate aftermath of emergencies, development aid responds to

[44] https://www.unescap.org/sites/default/files/pre-ods/E_CDR(4)_INF4.pdf
[45] https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg2-chapter18-1.pdf
[46] http://undocs.org/en/A/RES/51/240

ongoing structural issues, particularly systemic poverty, that may hinder economic, institutional, and social development in any given society, and assists in building capacity to ensure resilient communities and sustainable livelihoods (from humanitarian to development aid)

The United Nations General Assembly resolution 46/182 of 1991, "Strengthening of the coordination of humanitarian emergency assistance of the United Nations", the Magna Carta of today's humanitarian activity, makes clear that prevention is to be pursued as much as possible to reduce the impact of crises, and asserts that once a crisis occurs, "a smooth transition from relief to rehabilitation and development" is the ideal goal.[47]

Additionally, during the World Humanitarian Summit in 2016, UN Secretary-General Ban Ki Moon advocated for linking the humanitarian sector's work to the UN's 2030 Agenda for Sustainable Development Goals. In his words; "Humanitarian actors need to move beyond repeatedly carrying out short-term interventions year after year, towards contributing to the achievement of longer-term development results. Therefore, development actors need to plan and act with greater urgency, to tackle people's vulnerability, inequality and risk, as they pursue the Sustainable Development Goals." [48]

The Sustainable Development Goals launched by the United Nations in 2015, are a global framework for development by the year 2030. They are known as the world's blueprint to achieve a better and more sustainable future for all. At its heart are 17 targets, which are an urgent call for action by all countries (developed and developing), in a global partnership. These 17 SDGs are integrated—that is, they recognize that action in one area will affect outcomes in others and that development must balance social, economic, and environmental sustainability.

Figure 9 United Nations Sustainable Development Goals[49]

- **Emergency Management**

A crisis or emergency is a threatening condition that requires urgent action. It is an extraordinary situation in which people are unable to meet their basic survival needs, or there are serious and immediate threats to human life and well-being. [50] Effective emergency action can avoid the escalation of an event into a disaster. Emergency Management entails an ongoing process to prevent, mitigate, prepare for, respond to, and recover from an incident that threatens life, property, operations, or the environment."[51]

[47] https://digitallibrary.un.org/record/135197?ln=en
[48] https://digitallibrary.un.org/record/822154?ln=es
[49]https://www.un.org/sustainabledevelopment/news/communications-material/
[50] http://www.fao.org/3/X6868E/x6868e00.htm
[51] nfpa.org/assets/files/aboutthecodes/1600/1600-13-pdf.pdf

In this light, emergency management programs therefore should seek to promote safer and less vulnerable communities, with the capacity to cope with hazards and disasters. This is achieved by coordinating and integrating all activities necessary to build, sustain, and improve the capability to mitigate against, prepare for, respond to, and recover from threatened or actual natural disasters, acts of terrorism, or other man-made disasters. The expression "disaster management", is sometimes used instead of emergency management. There are four phases of Emergency Management, as depicted by figure 10 below;

Figure 10 Key Phases of emergency management [52]

- **Disaster Risk Reduction**

The United Nations International strategy for Disaster Reduction (UNISDR) defines Disaster Risk Reduction (DRR) as the concept and practice of reducing disaster risks, through systematic efforts to analyze and manage the causal factors of disasters, through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.[53] Although DRR initiatives are largely linked to mitigation and preparedness actions, from a conceptual point of view, DRR's remit is much broader.

DRR is holistic in the breadth of its interventions as it seeks to address a wide range of issues, from policy and governance, education and awareness, to addressing the underlying features of vulnerability and risk to hazards and stresses.[54] As such, DRR thinking sees disasters as complex problems requiring a collective response from a wide range of stakeholders, including non-governmental organizations (NGOs), civil society organizations (CSOs), governments at all levels, the private sector, and communities.[55]

Central to DRR programming is the adoption of a risk management approach, i.e. 'systematic approach to identifying, assessing, and reducing risks of all kinds associated with hazards and human activities.[56] Although DRR is more concerned with the present and focuses on near time trends, other wide ranges of risks that the approach considers are future risks

[52] http://www.masslocalinstitute.info/EPinMA/EPinMA_print.html
[53] https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf
[54] https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/5860.pdf
[55] https://www.preventionweb.net/publications/view/1066
[56]https://www.humanitarianlibrary.org/sites/default/files/2014/06/Disaster%20risk%20reduction%20Mitigation%20and%20preparedness%20in%20development%20and%20emergency%20planning.pdf

such as climate change and variability. Disaster Risk Management (DRM) is the operationalization of DRR approaches and covers the implementation of preparedness, mitigation, emergency response, and relief and recovery measures.

A comprehensive approach to reduce disaster risks is set out in the Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework), whose expected outcome is, "The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities, and countries." [57] The Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015. It is built on elements which ensures continuity with the work done by States and other stakeholders under the HFA, and introduces several innovations as called for during the consultations and negotiations throughout its development.[58]

The Framework works hand in hand with the other 2030 Agenda agreements, including The Paris Agreement on Climate Change, The Addis Ababa Action Agenda on Financing for Development, the New Urban Agenda, and ultimately the Sustainable Development Goals. The UN Office for Disaster Risk Reduction (UNDRR)— formerly known as UNISDR—is the focal point of the United Nations system for disaster risk reduction and the custodian of the Sendai Framework. It provides a vehicle for cooperation among governments, organizations, and civil society actors in the implementation of the Framework, supports countries and societies in its implementation, monitoring, and review of progress. Key to note is that while the term "disaster reduction" is sometimes used, the term "Disaster Risk Management" provides a better recognition of the ongoing nature of disaster risks, the ongoing potential to reduce these risks, and represents a broader term focusing on the overall disaster resilience.

Figure 11 Sendai Framework Global Targets.[59]

- **Climate Change**

The United Nations Framework Convention on Climate Change (UNFCCC, defines climate change as, "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". Climate change is happening and the links between rising temperatures and human activities are considered "unequivocal". The IPCC has outlined the likely impacts of climate change in the coming decades if the international community fails to act. These include sea-level rise,

[57] https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030
[58] https://www.preventionweb.net/files/44983_sendaiframeworkchart.pdf
[59] https://www.preventionweb.net/sendai-framework/sendai-framework-for-drr/at-a-glance

which could deprive millions of people of their land and livelihoods, in addition to the melting of mountain glaciers, which are the source of water for millions of people, businesses, and farmers around the world. [60]

The UN Framework Convention on Climate Change (UNFCCC)-1992 ratified by 197 countries was the first global treaty to explicitly address climate change. It established an annual forum known as the Conference of the Parties (COP), for international discussions aimed at stabilizing the concentration of greenhouse gases in the atmosphere. It was owing to these meetings, that the Kyoto Protocol and the Paris Agreement came into existence. Kyoto Protocol was adopted in 1997 and entered into force in 2005, and was the first legally binding climate treaty. It required developed countries to reduce emissions by an average of 5 percent below 1990 levels, and established a system to monitor countries' progress. [61]

The Paris Agreement was adopted in 2015, making it the most significant global climate agreement to date. The Agreement requires all countries to set emissions-reduction pledges. Governments set targets, known as Nationally Determined Contributions (NDC), with the goals of preventing the global average temperature from rising 2°C (3.6°F) above preindustrial levels and pursuing efforts to keep it below 1.5°C (2.7°F). It also aims to reach global net-zero emissions, where the amount of greenhouse gases emitted equals the amount removed from the atmosphere, in the second half of the century.[62]

This is also known as being climate neutral, and the greenhouse gases being referred to hereforth includes; Carbon dioxide (CO_2), Nitrous oxide (N2O), Methane (CH4), Ozone (O3), Some Halocarbons (such as Hydrofluorocarbons (HFCs), Sulfur hexafluoride (SF6), Nitrogen trifluoride (NF3) and Perfluorocarbons PFCs). Carbon dioxide (CO_2) is the most common GHG emitted by human activities, accounting for 76% of the total greenhouse gas emissions. A such an effort to balance emissions of carbon dioxide with its removal (often through carbon offsetting) or by eliminating emissions as envisaged by the 4 ADRA offices, is referred to as being Carbon neutral , which is a big step towards climate neutrality.

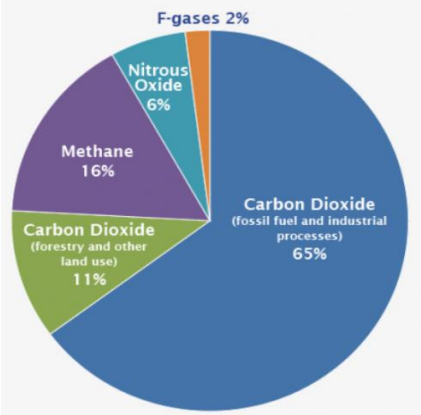

Figure 12 Global Greenhouse Gas emissions by Gas.[63]

Although the term "carbon neutral" is used, its measurements also include other greenhouse gases, usually carbon-based, and are measured in terms of their carbon dioxide equivalence. A carbon dioxide equivalent or CO_2 equivalent (abbreviated as CO_2-eq), is a metric measure used to compare the emissions from various greenhouse gases, based on

[60] https://www.un.org/en/chronicle/article/un-role-climate-change-action-taking-lead-towards-global-response
[61] https://unfccc.int/resource/docs/convkp/kpeng.pdf
[62] https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf
[63] https://www.ipcc.ch/report/ar5/wg3/

their global-warming potential (GWP). This is done by converting amounts of other gases, to the equivalent amount of carbon dioxide with the same global warming potential.[64]

Greenhouse Gas		Global Warming Potential (GWP)
1.	Carbon dioxide (CO_2)	1
2.	Methane (CH_4)	25
3.	Nitrous oxide(N_2O)	298
4.	Hydrofluorocarbons (HFCs)	124 – 14,800
5.	Perfluorocarbons (PFCs)	7,390 – 12,200
6.	Sulfur hexafluoride (SF_6)	22,800
7.	Nitrogen trifluoride (NF_3)[3]	17,200

Figure 13 Global warming potential for Major Greenhouse Gases[65]

While 4 of the ADRA offices might have applied one or more of these instruments to some extent, a priority is to extend their use and to link them to provide a strong and consistent price signal across all ADRA network offices.

- **Linkages**

Efforts to reduce disaster risks and climate change risks have co-existed for a long time, and in recent years, there has been growing attention to the relationship between climate change (adaptation & mitigation) and disaster risk reduction. Climate change, disaster risk reduction, and mitigation are closely linked, i.e. it is expected that more extreme weather events in the future are likely to increase the number and scale of disasters, while at the same time, the existing methods and tools of disaster risk reduction provide powerful capacities for adaptation and mitigation to climate change.[66]

However, there currently exists disconnects between Development, Emergency Management, Disaster Risk Reduction, and Climate Change (adaptation & mitigation). This is evident across various stakeholders such as government, public and private sector, as well as the NGOs. Across most of these institutions, policies are separate and are not integrated, as such, actual implementation of say emergency management, climate change, or development initiatives do not take into consideration DRR or vice versa.

Nonetheless, an opportunity for improving the links between Disaster Risk Reduction and Climate Change (adaptation & mitigation) in the context of sustainable development, was identified with the overhaul of several key international policies in 2015. The Sendai Framework, Paris Agreement, Sustainable Development Goals, and the New Urban Agenda, were all created in a time of increasing need for coherence between international policies on climate change. They emphasize the need to work towards linking disaster risk reduction, climate change adaptation, and mitigation in practice. Since that time, there has been efforts through international platforms such as the Global Platform for Disaster Risk Reduction, and the United Nations Framework Convention on Climate Change (UNFCCC) technical expert meetings on adaptation, to build an understanding about building these links in national policies and various sectors.[67]

[64]https://ec.europa.eu/eurostat/statisticsexplained/index.php/Glossary:Carbon_dioxide_equivalent#:~:text=A%20carbon%20dioxide%20equivalent%20or,with%20the%20same%20global%20warming
[65] https://ecometrica.com/assets/GHGs-CO2-CO2e-and-Carbon-What-Do-These-Mean-v2.1.pdf
[66] https://www.eird.org/wiki/images/Climate-Change-DRR.pdf
[67]https://unfccc.int/sites/default/files/resource/techpaper_adaptation.pdf

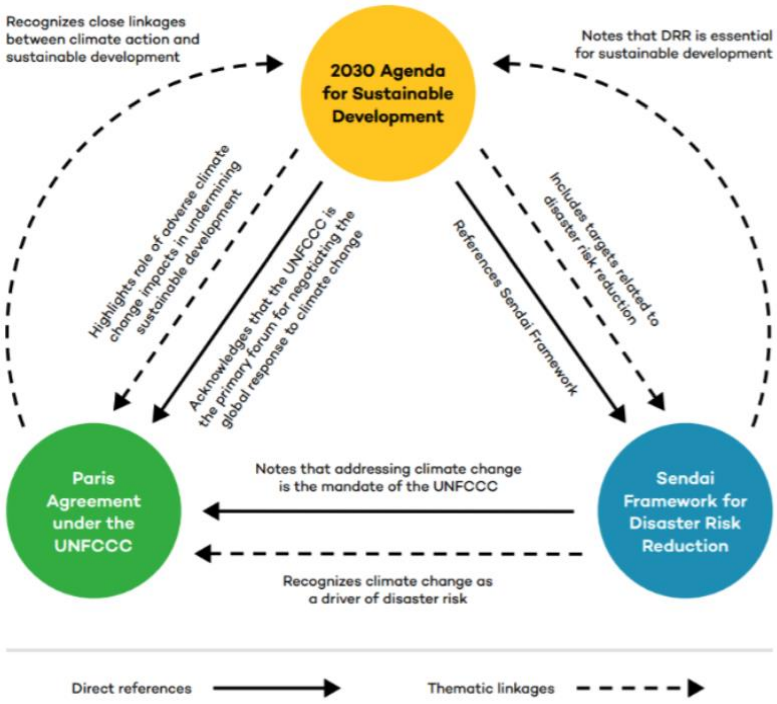

Figure 14 Connection in the texts of Global Agendas. [68]

It is therefore evident that climate change (adaptation and mitigation), sustainable development and disaster risk agendas are inextricably linked. Yet there is no formal inter-relationship between the three international processes, and each were negotiated through separate fora. This is not to say that there are no linkages between them, as a matter of fact, there is ample evidence to show that they are in fact intertwined, as highlighted below:[69]

- Article 7(1) of Paris Agreement: "Parties hereby establish the global goal on adaptation of enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change, with a view to contributing to sustainable development (…)". It shows that strengthening resilience and reducing vulnerability are core concepts at the intersection of adaptation, sustainable development, and disaster risk reduction. It has been suggested that "by putting resilience at the core of planning, as opposed to one of adaptation, sustainable development or disaster risk reduction, actors can pursue solutions that contribute to all three global agendas."
- Goal 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. Specifically, is Goal 9.1, which facilitate sustainable and resilient infrastructure development in developing countries, through financial and tech support to African countries, LDCs and SIDS; This is like Sendai Framework Target D, which seeks to substantially reduce disaster damage to critical infrastructure through proper design, construction, and retrofitting. This is also the case with Art.8(4) of the Paris Agreement, i.e. "Accelerating, encouraging and enabling innovation is critical for an effective, long term global response to climate change and promoting economic growth and sustainable development."
- Priority 4, Sendai Framework, 'Build back better', contemplates the adaptation and development dimensions of post-disaster recovery e.g. "to (…) facilitate the link between relief, rehabilitation, and development … to develop capacities that reduce disaster risk … through measures such as land-use planning, structural standards improvement, sharing of … lessons learned, and integrate post-disaster reconstruction into the economic and

[68]https://www.transparencypartnership.net/system/files/document/3.%20Deborah_PATPA_linkages_Uganda_May2019.pdf
[69]https://legalresponse.org/legaladvice/interfaces-between-the-sendai-framework-the-paris-agreement-and-the-sustainable-development-goals/

social sustainable development of affected areas (…)"(para.33(j). Many of the priority actions of Priority 4, Sendai Framework are also in line with the measures identified under Art.8(4) Paris Agreement, on loss & damage, e.g. early warning systems, emergency preparedness, comprehensive risk assessment and management, risk insurance solutions, and resilience of communities, livelihoods, and ecosystems.

- Goal 13 Climate change action: 13.1 strengthen resilience and adaptation to climate-related hazards and natural disasters; 13.3 improve education and build capacity on climate change mitigation, adaptation, impact reduction, and early warning; The same is articulated in Sendai Framework Target E – Substantially increase the number of countries with national and local disaster risk reduction strategies, Target F – Enhance international cooperation to developing countries through support, Target G – Increase availability of early warning systems and disaster risk info and assessment. Further, the Paris Agreement in Article 11 and Article 12 articulates the same by pointing out the need for Capacity-building and enhanced climate change education, training, public awareness, public participation, and public access to information respectively.
- Goal 15 Life on land, specifically goal 15.2; sustainable forest management and halting deforestation; 15.1 conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems; 15.3 restoring degraded land and combating desertification; and 15.9 integrate ecosystems and biodiversity values into national and local planning, development processes and poverty reduction strategies. The Sendai Framework, Para.28(d) calls for the promotion of cooperation for the implementation of ecosystem-based approaches regarding shared resources, to build resilience and reduce disaster risk. Paris Agreement Art.5 refers to sustainable management of forests, as carbon sink and more broadly importance of reducing emissions from deforestation and forest degradation (REDD+). Art.7 – adaptation esp. 7.9(c) assessment of climate change impacts and vulnerability to prioritize action, considering vulnerable people and ecosystems; and 7.9(e) – build the resilience of ecological systems, through sustainable management of natural resources
- Goal 17 – strengthen means of implementation, i.e. finance, technology, and capacity-building and revitalize partnership for the goals, Sendai Framework Para.17 – Sendai Framework goal requires enhancement of implementation capacity of developing countries, incl through international cooperation for the provision of means of implementation Para 18(f) – enhance international cooperation to developing countries through adequate and sustainable support Paris Agreement Art.3 – support developing country Parties for the effective implementation of Paris Agreement Art.7.6, 7.7, and 7.13 – strengthen regional cooperation on adaptation where appropriate, continuous and enhanced support to developing countries.

Further, more linkages pertaining SDG and Sendai Framework indicators to climate change adaptation, are presented in the table below.[70]

[70] https://unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.33/2018/mtg4/S3_2_unfccc.pdf

SDG Indicators that could relate to climate change adaptation		
Goal		**Indicators**
Climate action	**13.2.1**	Number of countries that have formally communicated the establishment of integrated low-carbon, climate-resilient, disaster risk reduction development strategies (e.g. a national adaptation plan process, national policies, and measures to promote transition to environmentally-friendly substances and technologies).
	13.1.1	Number of deaths, missing people, injured, relocated, or evacuated due to disasters per 100,000 people
	13.3.1	Number of countries that have integrated mitigation, adaptation, impact reduction, and early warning into primary, secondary, and tertiary curricula
Zero hunger	**2.4.1**	Percentage of agricultural area under sustainable agricultural practices
	2.4.2	Percentage of agricultural households using irrigation systems compared to all agricultural households
Clean water and sanitation	**6.4.1**	Percentage change in water use efficiency over time
	6.5.1	Degree of integrated water resources management implementation (0-100)
Sustainable cities and communities	**11.b.1**	Percentage of cities implementing risk reduction and resilience strategies aligned with accepted international frameworks (such as the Sendai Framework)
Life on land	**15.2.1**	Forest cover under sustainable forest management
Sendai Framework compound Indicators that could relate to climate change adaptation (outcomes and enabling environments)		
Global target		**Indicators**
Disaster mortality	**A-1**	Number of deaths and missing persons attributed to disasters, per 100,000 population
Affected people	**B-1**	Number of directly affected people attributed to disasters, per 100,000 population (including population injured or ill, whose dwelling is damaged or destroyed, and whose livelihood is disrupted or destroyed)
Economic loss	**C-1**	Direct economic loss attributed to disasters in relation to global gross domestic product (including losses from agriculture, housing sector, productive assets, critical infrastructure, and cultural heritage damaged or destroyed)
Critical infrastructure and basic services	**D-1**	Damage to critical infrastructure attributed to disasters (including health and educational facilities damaged or destroyed and critical infrastructure units and facilities)
	D-5	Number of disruptions to basic services attributed to disasters (including educational, health, and other basic services)
Developing countries' support	**F-1**	Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030
Early warning systems	**G-1**	Number of countries that have multi-hazard early warning systems

Figure 15 linkages between SDG and Sendai Framework indicators

Important to note is that although development is generally considered a key element to reducing vulnerability to disasters and climate change, not all development will do this; in fact, some development may increase community vulnerability. For example, when dams are built, the change in water volume and flow can affect floods and drought risks downstream. Such problems are not inherent to development, but result from a failure to consider current and future disaster risks in the planning process. As such, an ADRA office must be conscious of its development interventions, in that they do no harm to the environment and the lives and livelihoods of surrounding communities.

Therefore, a rethink is urgently needed to better link disasters, disaster risk reduction, climate change adaptation, and development issues in theory and practice to enable transformational change in how agencies do development. For instance, this could best be achieved by ensuring that ADRA development projects undergo environmental impact assessment, ensuring that climate risk assessments are part of development program planning and evaluation, as well as aligning the SDG, Sendai Framework, and DRR indicators into development project design and M&E systems.

Climate change will bring a range of impacts, that communities will find hard to adapt to. The specter of these climate risks will be broad, with a slow onset of events, to a range of extreme weather events as shown (see fig.16). As such, a policy and institutional framework that takes an integrated approach to facilitate adaptation (where possible), and addressing loss and damage (where unavoidable), by combining the theory and practice of Disaster Risk Reduction and

Climate Change (adaptation and mitigation), will likely help reduce loss and damage, as well as build climate resilient communities.[71]

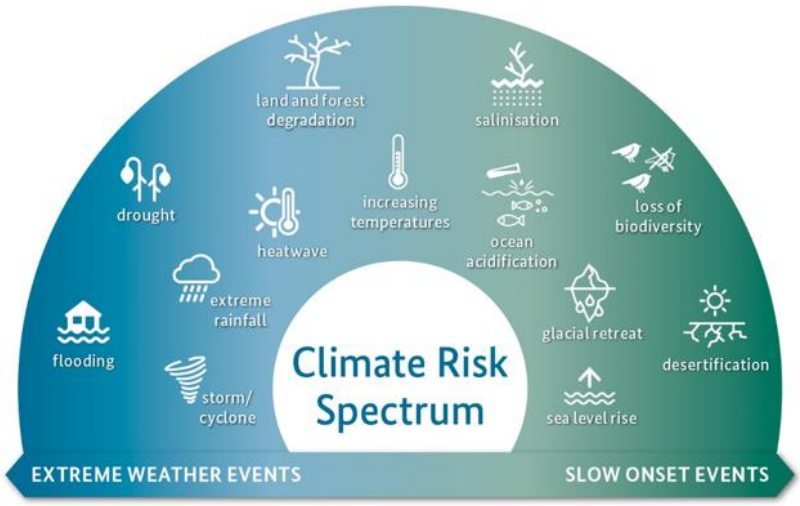

Figure 16 GIZ Global Programme Climate Risk Spectrum

The central role played by DRR/DRM in achieving sustainable development and resilience is further illustrated in the below diagram, which illustrates the linkages between climate change, Sustainable development through SDGs, and Disaster Resilience.

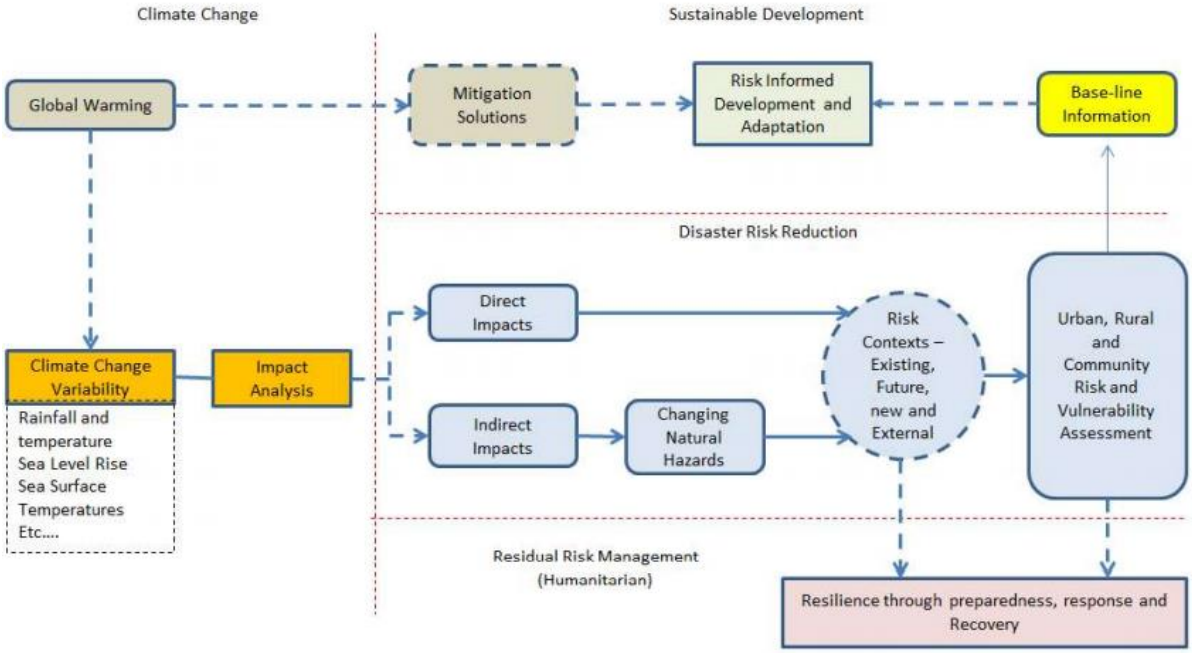

Figure 17 Linkages between framework themes and resilience

In this light, it is therefore recommendable that an ADRA office considers mainstreaming Climate Change (adaptation & mitigation) and DRR/DRM initiatives into its development processes, relief response and policies, as part of sustainable programming of its humanitarian relief and development actions.

[71] https://assets.publishing.service.gov.uk/media/57a08a3740f0b649740004ae/bangladesh-risk-policy.pdf

4.4 Mainstreaming CCA and CCM into ADRA policies and programs

A quest for operational approaches and tools to support climate change adaptation and mitigation mainstreaming has been on the rise, with a burgeoning in number of climate change adaptation and mitigation approaches, methods, guidance, and tools in development. These efforts have to a large extent been undertaken independently by various national and international agencies, organizations, institutions, and NGOs, based on different rationales, objectives, and targets.[72] In this section, we focus on how ADRA network offices can mainstream CCA and CCM into their policies and programs.

Mainstreaming generally means that, a particular issue is constantly considered, reflected in, and integrated into broader decision-making processes and activities, with the ultimate goal that the issue becomes broadly accepted, and is viewed as a normal aspect impacting processes and activities.[73] The purpose of mainstreaming climate change adaptation and mitigation is to address climate change within development planning, decision-making, and regular budgeting processes, rather than as a stand-alone measure or a separate sector. This is meant to provide for more efficient use of resources, and improved sustainability of investments in the context of a changing environment.[74]

Further, with regards to mitigation, mainstreaming means that development policies, programs, and/or individual actions that otherwise would not have taken climate change mitigation into consideration, explicitly include these when making development choices.[75] Several initiatives towards the integration of adaptation in development planning and in aid portfolios have been taken during recent years. These include the European Commission's Action Plan on Climate Change of 2004[76], the independent Commission for Africa in 2005,[77] the Gleneagles Summit in 2005 [78], OECD Declaration on Integrating Climate Change Adaptation into Development Co-operation[79], GIZ's Climate Protection Programme[80], the National Adaptation Plans (NAP) established under the Cancun Adaptation Framework[81], as well as the UNDP/UNEP National Adaptation Plan Global Support Programme (NAP-GSP) [82].

The 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change, are among the latest frameworks that demand a radical acceleration of environment, and climate change mainstreaming into development policies and programmes. Mainstreaming adaptation and mitigation objectives into development plans and sectoral policies pays dividends. Among the benefits includes; increased likelihood of success to a development project/program under a changing climate, and enhanced results across programmatic objectives, thereby contributing to more efficient use of financial and nonfinancial resources.[83] In this light, the sections below describe in detail, what key issues need to be considered and the general steps to be taken, in creating an effective atmosphere for mainstreaming and implementing CCA and CCM.

Step 1: Creating an enabling environment for mainstreaming DRR and CCA & CCM;

[72] https://www.preventionweb.net/files/13122_UNDPStocktakingReportCCmainstreamin.pdf
[73] https://climatepolicyinfohub.eu/glossary/mainstreaming
[74] https://www.ipcc.ch/apps/njlite/srex/njlite_download.php?id=6196
[75] https://www.ipcc.ch/site/assets/uploads/2018/03/ar4_wg3_full_report-1.pdf
[76] https://ec.europa.eu/clima/policies/eccp_en
[77] http://www.commissionforafrica.info/wp-content/uploads/2005-report/11-03-05_cr_report.pdf
[78] http://www.g8.utoronto.ca/summit/2005gleneagles/climatechange.html
[79] https://www.oecd.org/env/cc/44887764.pdf
[80] https://www.adaptationcommunity.net/download/ms/mainstreaming-tools/Integrating_cc_adaptation_into_development_planning-training_manual.pdf
[81] https://unfccc.int/topics/adaptation-and-resilience/workstreams/national-adaptation-plans
[82] https://www.globalsupportprogramme.org/nap-gsp
[83] https://www.wri.org/research/planning-action-mainstreaming-climate-change-adaptation-development

Below is a list of key issues adopted from the International Federation of Red Cross and Red Crescent Societies (A guide to mainstreaming guiding principles disaster risk reduction and climate change adaptation), that can be considered in creating an enabling environment, for effective implementation of CCA and CCM mainstreaming strategy in an ADRA office.

- **Policy and strategic framework:** For CCA and CCM to be appropriately mainstreamed in an ADRA office, it should be supported by a relevant policy e.g. Environmental, Climate Change, or Resilience Policy. Such a policy needs to set out a broad goal and objectives for mainstreaming CCA and CCM within the organization and provide a framework for addressing mainstreaming issues through an enabling policy framework.

- **Leadership, support, and management commitment;** The commitment and support from the leadership and management of an ADRA office, is important to ensure effective CCA and CCM mainstreaming. Without such a commitment and support, the issue will struggle to gain a profile in the short term. Additionally, in the long term, it may be difficult to achieve coordination, monitoring of progress across the organization, and engagement in strategic processes, in mainstreaming the issue into normal business operations.

Equally important is the commitment and support of line project/programme managers of relevant departments who are in the long run, in the best position to facilitate the engagement and ownership of their staff. The lack of such a commitment and support from line managers usually sends a clear signal to their staff that they do not need to apply themselves, even if there is a formal mainstreaming policy that they are part of. Therefore, an ADRA office must give due consideration to guaranteeing the commitment and support of their leadership and management, for effective implementation of DRR and CCA& CCM mainstreaming.

An example in this case, would be the approval of office activities that support mainstreaming culture such as; ensuring that an ADRA office does not request catering services that use single-use plastics such as water/sodas plastic bottles, but rather, one that employs eco-friendly catering serving ware such as reusable glass bottles and plates. Additionally, ADRA leadership and management could encourage and promote ADRA employee green behavior at work by; promoting green activities, ensuring that all project transport approvals consider the best options with the least GHG emission such as carpooling, promoting paperless office activities through support of digital and cloud computing solutions to allow for collaboration and green engagements such as Microsoft Office Teams, One Drive and Google Drive.

By showing support for CCA and CCM mainstreaming, ADRA leaders/management passes a strong signal to their staff about their value for environmental concerns, hence creating a conducive environment for climate change mitigation and adaptation options. From their behaviors, the ADRA staff members get to receive an indication of the most appropriate behavior to be displayed in reciprocation. As such, these staff end up reciprocating by voluntarily means, as well as advocating it to other staff members.

Step 2. Developing organizational capacity: Documentation of CCA and CCM to support the mainstreaming process in organization policies and programs must go beyond simply developing the mainstreaming tools and procedures, to ensuring their effective application and implementation. As such, the necessary capacity to make mainstreaming happen must be built. Building the necessary skills and knowledge is crucial to increasing ADRA staff's understanding and ultimately, ownership of the mainstreaming process. Policies and best practices must be understood, implemented, and maintained by all staff. These skills, knowledge, and understanding can be developed through senior management briefings, reference materials, and staff training. Finally, the assessment of the capacity to understand and address the CCA & CCM mainstreaming issues should be followed by an organization's measures to strengthen it, supported by regular monitoring and evaluation.

Step 3. Designing a CCA&CCM sensitive project cycle: All programs and projects are usually designed and managed through a sequence of interrelated phases of a project management cycle. Applying a CCA and CCM lens in an ADRA's office project cycle is an effective way of designing risk informed and climate-smart programs and policies. In this regard, for CCA and CCM to be effectively mainstreamed, it is necessary for ADRA's project/programme managers, to make it a rule of thumb. What this means, is that disaster and climate change risks should be considered and prioritized, in the organization project management cycle phases. These phases include but are not limited to analysis/assessments, design, implementation, monitoring, and evaluation.

Now that we have outlined the key issues to be considered in creating an enabling environment for effective implementation of a CCA and CCM mainstreaming strategy, we are going to look at the general steps to be taken, in mainstreaming CCA and CCM across ADRA policies and programmes.

1. General steps to be taken to mainstream CCA and CCM

I. Climate Risk Screening (CRS)

The first step in mainstreaming CCA and CCM, is to screen a policy, programme and/or project in question, with a climate change lens for possible risks. According to the Intergovernmental Panel on Climate Change (IPCC), risk is the "potential for adverse consequences where something of value is at stake and where the occurrence and degree of an outcome is uncertain. In the context of climate impact assessment, the term risk is often used to refer to the potential for adverse consequences of a climate-related hazard, or adaptation/mitigation responses to climate hazards that affect; lives, livelihoods, health and well-being, ecosystems and species, economic, social, and cultural assets, ecosystem services, and infrastructure.[84]

The figure below shows the linkage and complexity of global challenges and associated risks. The top ten risks, in terms of their impact, feature several environmental risks such as: extreme weather events, natural disasters, failure of climate change mitigation and adaptation, biodiversity loss, and ecosystem collapse. Additionally, two societal risks (food and water crises) are closely intertwined with the environment, making it to the top ten.[85]

[84] https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.STAP_.C.56.Inf_.03_STAP%20guidance%20on%20climate%20risk%20screening.pdf
[85] http://www3.weforum.org/docs/WEF_GRR18_Report.pdf

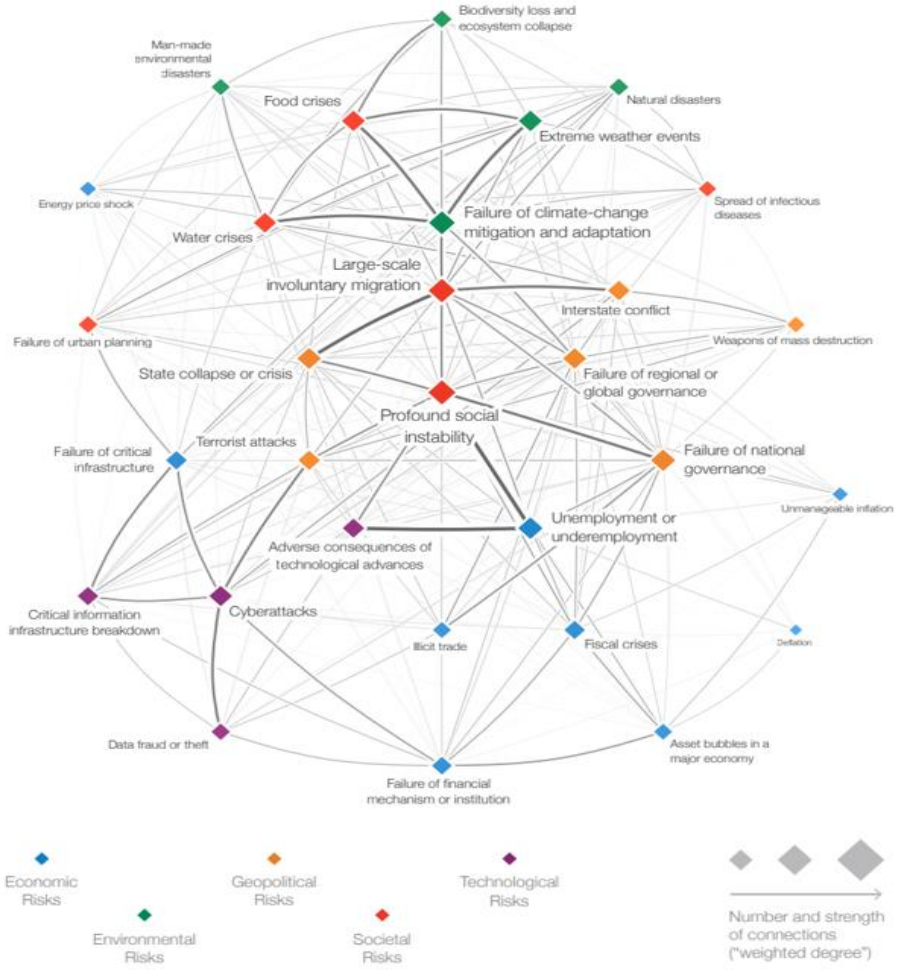

Figure 18 Global Risks Interconnection Map

Climate risk screening (CRS), is therefore a systematic process of examining activities, outputs and programmes, to identify their vulnerability to climate change. This includes an assessment of the extent to which vulnerability is being or could be addressed.[86] More generally, there is consensus in the literature that climate change screening (often simply termed climate screening) is a way of establishing information on the impacts of climate change on development activities, and of how these linkages are or can be, considered in development activities as well as in the national planning and decision-making processes.[87]

Climate risk screening is by contrast defined by the Asia Development Bank (ADB), as involving the analysis of project concepts, with a view to identifying the following:

- whether climate risks have been taken into consideration,
- whether the concepts are vulnerable to climate change,
- whether plans could lead to increased vulnerability, and
- what steps taken in project design, are needed to reduce risks and associated costs.

[86]http://bangladesh.um.dk/en/~/media/Bangladesh/Documents/Content%20English/Development%20issues/Climate%20change%20adaption/Climate%20management%20plans/CCScreeningReport.ashx
[87] https://www.preventionweb.net/files/13122_UNDPStocktakingReportCCmainstreamin.pdf

At a minimum, each ADRA office should employ a climate risk screening process, that includes four steps (hazard identification, assessment of vulnerability and exposure, risk classification, risk mitigation plan). Additionally, it is important that the risks identified are ranked according to a clearly defined scale (as illustrated in the table below), and uses the best available data, which could be in sources such as; Climate Change Country/county Profiles, indigenous weather knowledge, and IPCC reports, among other national/global scientific climate/weather reports.

Score	Rating	Impacts
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment
2	Minor	Very minor impacts in terms of severity and magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
3	Intermediate	Impacts of medium magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed, and/or mitigated with relatively uncomplicated accepted measures
4	Extensive	Adverse impacts on people and/or environment of considerable magnitude, spatial extent, and duration, but more limited than Extreme (e.g. more predictable, mostly temporary, reversible). Impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially Extensive15
5	Extreme	Significant adverse impacts on human populations and/or the environment. Adverse impacts of large-scale magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas adversely impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant levels of displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict

Table 2 Classification of risks

Below is set of questions and answer table, that summarizes this step.

Questions	Answers
What is the aim of CRS?	To check whether a policy, programme or a project, has considered and addressed the existing or future risks associated with climate change. It is meant to be done in a rather generic and quick way, without having specific knowledge on climate change and without having access to detailed risk or climate data. This rapid and rough screening of risks and opportunities is intended to decide whether to proceed with a detailed assessment.

<table>
<tr><td>When do you do it?</td><td>The screening should be done at the beginning of the planning process of a new project /programme, or during the review of a running activity.</td></tr>
<tr><td>How do you do it?</td><td>The following are some of the key steps that an ADRA office could follow, during a climate risk screening process;

Step 1: Describe the climate risks and impacts in the community:

Tools and methods: Climate data analysis, agro-meteorological analysis, socio-economic data, agricultural production changes, past impacts, and future anticipated impacts.

Outputs: List and describe the nature of climate risks using both participatory and scientific tools, as well as secondary information.

Step 2: Conduct climate risk mapping:

Tools and methods: Mapping of key risks in terms of probability, exposure, and consequence.

Outputs: A map of the community climate risks.

Step 3: Describe the vulnerabilities and capacities of the community:

Tools and methods: Indigenous knowledge and copying analysis, secondary data on vulnerable groups, enabling/disabling institutions, external support.

Outputs: Identified vulnerable groups, their capacities and coping ranges, to manage current and future climate risks.

Step 4: Rank the climate risks:

Tools and methods: Matrix ranking based on frequency, vulnerabilities, capacities, and potential future impacts.

Outputs: Prioritized current and future climate-related risks.

Step 5: Decide whether to prevent, reduce, transfer, or live with the risks:

Tools and methods: Stakeholder discussion and participatory methods.

Outputs: Developed strategies for integrated climate risk management.

The table below provides an example of some of the key questions that are used during this screening process[88]:

<table>
<tr><th>Example of Screening Questions</th><th>Answer Yes/No</th><th>Explanation</th></tr>
<tr><td>Based on current climate conditions and long-term climate projections (if available), are there any potential</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

[88] https://www.climatecentre.org/downloads/files/IFRCGeneva/IFRCMainstreamingDRR+CCA.PDF

	Climate Risks that are known or forecast to get worse in the project's location/with the planned programme?		
	What risk levels do the identified and anticipated climate risks fall into i.e. high, moderate, low?		
	Has the planned project/programme included actions to address these risks?		
	Do these actions reduce vulnerability to climate change risks and disasters?		
	Do you have enough capacity to deal with the estimated risks?		
	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices*)? For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding.*		
	Will the proposed Project/programme result in significant greenhouse gas emissions or may exacerbate climate change?		
	Is the Government in this jurisdiction already regulating carbon assets/emissions or is it likely to in the future? What impact will that have on the project's operations.		
	Has the Government made any public climate commitments?		
	Is there any link between these commitments and the approvals required for this activity (programme/project)?		
	Please note that, once an ADRA office has conducted a screening activity and decides to proceed with a project whose screening results are of high risks, it is recommended that a detailed climate risk assessment is conducted.		

	<table><tr><td>HIGH RISK</td><td>• You are strongly encouraged to conduct a more detailed risk assessment and to explore measures to manage or reduce those risks.</td></tr><tr><td>MODERATE RISK</td><td>• For areas that your screening has identified as at *Moderate Risk*, you are encouraged to build on the screening through additional studies, consultation, and dialogue. This initial screening may be supplemented with a more detailed risk assessment to better understand the nature of the risk to the project</td></tr><tr><td>LOW/NO RISK</td><td>• If you are confident that climate and geophysical hazards pose *no or low risk* to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented.</td></tr><tr><td>INSUFFICIENT UNDERSTANDING</td><td>• Gather more information to improve your understanding of climate and geophysical hazards and their relationship to your project</td></tr></table> There exist several climate screening tools that an ADRA office could use, these include; -Climate Risk Assessment Services for agri-food sector: (http://edepot.wur.nl/471420) -UNDP Social and Environmental Screening Procedures (SESP): (https://www.undp.org/publications/undps-social-and-environmental-screening-procedures-sesp) -World Bank Climate and Disaster Risk Screening Tools (Requires a registration to freely access the tools) https://climatescreeningtools.worldbank.org/ - Integrating the environment and climate change into EU international cooperation and development: https://europa.eu/capacity4dev/pg/documents/new-guidelines-integrating-environment-and-climate-change-eu-international-cooperation-0
Who should do it?	The screening can be done by a programme/project manager in charge of the activity (programme/project) as he/she is familiar with its context and focus. It can also be done by a group of appointed people, especially when it comes to a strategy or policy.

Table 3 Questions and answers summarizing climate risk screening

Finally, it is important to keep in mind that Climate risk screening is not only needed to ensure ADRA projects are resilient to shocks, but also for transformation and durability (proofing). The 2018 STAP paper, "Integration to Solve Complex Environmental Problems"[89], highlights the interrelationships between environmental and social challenges. It notes the need for broader systems thinking, including consideration of risks, to achieve transformation. Further, STAP's June 2019 paper on durability demonstrates that mitigating risks is important to ensure that the benefits of project investment are sustained over time. Therefore, Climate risk screening is critical to the success of ADRA programs and projects.

II. Detailed Climate Risk Assessments (CRA)

This is the second step into mainstreaming CCA and CCM. The detailed assessment should be done when the initial screening indicates the need for it. For the sake of ownership and sustainability of the planned activity (Programme/project), it is crucial to involve all stakeholders concerned in this process.

Below is a set of questions and answer table that summarizes this step.[90]

[89] http://stapgef.org/sites/default/files/publications/STAP%20Report%20on%20integration.PDF
[90] https://www.climatecentre.org/downloads/files/IFRCGeneva/IFRCMainstreamingDRR+CCA.PDF

Questions	Answers
What is the aim of CRA?	To assess whether a planned activity has considered and addressed climate risks, and associated adaptation and mitigations.
When do you do it?	The detailed assessment should be done when planning for a new programme/project activity, or the review of an existing activity.
How do you do it?	**a) Assess the disaster and climate change risks associated with the planned activity.** ▪ Collect available data on climate change, hazards, and socio-economic conditions that impact or might impact on current and future vulnerabilities (i.e. deforestation, migration towards urban areas, demography, access to resources and markets, etc.); ▪ Identify the most relevant hazards and climate change impact at present and in the future; ▪ Identify the elements most at risk; ▪ Identify the factors influencing the current and future vulnerability and adaptive capacities; ▪ Make an overall analysis of current and future risks and opportunities for the planned activity. b) **Identify possible adaptation and mitigation options** ▪ Various internal tools and guides developed by an ADRA office may be useful in this process, which includes, for instance, the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis among others. ▪ Brainstorm among assessment team members the possible adaptation and mitigation options without worrying about their feasibility, costs, or other limiting factors; ▪ Identify only new or adjustment options which are not yet included in the planned activity. - Examples of climate risks adaptation solutions regarding practices for agricultural development projects can be found in the link below; http://www.fao.org/3/cb3991en/cb3991en.pdf **c) Select the most appropriate among the identified adaptation and mitigation options.** ▪ Agree on selection criteria and rating options (e.g. low, medium, high). Selection criteria may include effectiveness, cost, feasibility, and sustainability, with each

<table>
<tr><td></td><td>having related questions. Please refer to the sample questions given in the table below.
▪ Answer the questions in the respective area of selection criteria and give an overall rating per each area. This can be done individually or collectively.
▪ Agree on the most appropriate adaptation and mitigation options for the planned project/programme by using the conducted selection criteria.
<table><tr><th colspan="4">Selection criteria and related question</th></tr><tr><th>Effectiveness</th><th>Cost</th><th>Feasibility</th><th>Sustainability</th></tr><tr><td>Does the option reduce vulnerability and help reinforce resilience?
Is the option flexible? i.e. Can it be adjusted in response to changing conditions?
How big is the group or target beneficiaries?</td><td>Is this option more expensive or cheaper than the others?
Are the long-term costs high or low? i.e. maintenance, administration, staffing, etc.
Can the planned programme/project activities cover the costs?</td><td>Are there necessary human, legal, technical, financial material, and administrative resources?
Are there enough skills, knowledge, and capacities to take this option?
Is there a need to adjust other policies to accommodate the adaptation and mitigation option?</td><td>Is this option socially, economically, and environmentally sustainable?
Is the option sustainable in the long term without external financial and technical support?</td></tr></table>
There exist several tools that an ADRA office network can use for detailed climate screening. One of them being the; Climate Risk and Vulnerability Assessment Tool: http://cridf.net/wp-content/uploads/2019/08/Knowledge_Product_Tool-2, that is easy to use and utilizes the updated Intergovernmental Panel on Climate Change (IPCC) methodologies.</td></tr>
<tr><td>Who should do it?</td><td>Detailed assessment should be done by the whole programme/project team, assigned to the activity, with the involvement of stakeholders concerned with the planned programme/project</td></tr>
</table>

Table 4 Questions and answer summarizing detailed climate risk assessment

Additionally, part of the detailed assessment would necessitate the application of environmental impact assessments (EIAs), especially for development programmes/projects. UNEP defines EIA as a tool used to identify the environmental, social, and economic impacts of a project before decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local

environment and present the predictions and options to decision-makers. As such, EIA by nature is probably not suitable as a primary means to tackle climate change.[91]

This is because EIAs are designed to identify a project's impact on the environment, but not the impact of environmental change on the project. Nevertheless, though not suitable as a primary means, EIA provides means in the fight against climate change, since its procedures could be used to mainly ensure programme/project plans and policies significantly advocate for reduction (or where visible) and prevention of greenhouse gas (GHG) emissions during development activities. Thus, the use of EIA procedures as part of mainstreaming CCA and CCM in ADRA, will not only result in climate-resilient programmes/projects, but will also lead to environmentally sustainable low-carbon development activities.

III. Developing a monitoring and evaluation (M&E) framework

Mainstreaming CCA and CCM can be ensured only when the process is regularly monitored and evaluated. Monitoring and evaluation are two distinct but interlinked activities. Monitoring is the ongoing collection, management, and analysis of data to ensure that a project or programme is on track to meet its adaptation aims. Monitoring typically involves several steps: identifying adaptation outcomes that are to be achieved, as well as related outputs, activities, and inputs; choosing indicators to assess progress, and managing and analyzing data collected. Evaluation on the other hand, is periodic assessments at key points during an intervention and/or after the project/ programme is completed, to see whether the intended results have been achieved. What is monitored feeds into what is evaluated, so they are often grouped as M&E.[92]

Below is a set of questions and answers table that summarizes this step.

Questions	Answer
What is the aim of the monitoring and evaluation framework?	To help evaluate whether an action is justified and whether it is bringing about the intended benefits and ultimately contributing to climate change adaptation and mitigation.
When do you do it?	An M&E framework needs to be defined as soon as the adaptation and mitigation measures have been selected and incorporated into a planned programme/project.
How do you do it?	Since there is no one-size-fits-all approach for designing adaptation interventions, adaptation M&E requires tailored methodologies that address adaptation and mitigation measures. Ideally, monitoring aimed at mainstreaming adaptation should include but not be limited to the following categories of data in formulating the indicators: [93] ▪ Climate data (e.g. temperature, extreme events, seasonal precipitation, start and length of the rainy season) ▪ Ecosystem services (e.g. agricultural yields, water availability, erosion)

[91]https://www.researchgate.net/publication/312443147_Success_by_1000_cuts_The_use_of_environmental_impact_assessment_in_addressing_climate_change

[92] https://www.oecd.org/derec/netherlands/IOB-Monitoring-Evaluating-Mainstreamed-Adaptation-Climate-Change.pdf

[93] https://www.cbd.int/financial/climatechange/g-climatedapationguide-undp.pdf

	▪ Socio-economic data (e.g. health, livelihoods, job, and income generation) Important to note is that while indicators play an important role in M&E, the most appropriate suite of indicators cannot be developed without a strong and thoughtful intervention design. Ultimately, if the M&E system does not result in learning, it has lost a critical opportunity to move the needle on adaptation and mitigation. Learning during the intervention is important for improvement during implementation.
Who should do it?	M&E framework should be developed by a team that has done the detailed assessment

Table 5 Questions and answers summarizing the development of the M&E framework

Finally, due to its cross-cutting nature, adaptation and mitigation could be easily mainstreamed into ADRA sectoral policies. This is because policy dialogue occurs at all phases as an ongoing programme process. Policy dialogue at the programming stage — and throughout the programme and project cycle, provides an opportunity for mainstreaming CCA and CCM as described below;

• **Programming phase:** Mainstreaming at the programming phase is particularly critical, as it influences all subsequent phases in the cycle of operations. A country situation analysis is the first entry point for mainstreaming climate change adaptation and mitigation. A country-level environmental or climate change assessment is a key tool for this analysis. The second key entry point is in the drafting of programming documents, that will ensure environmental implications are considered before the implementation decisions are made. Examples of tools used include; Strategic Environmental Assessment (SEA), and/or the Climate Risk Assessment (CRA).

Now that we are aware of what climate risk assessment (CRA) is all about, SEA is a systematic process for evaluating the environmental consequences of a proposed policy, plan or programme initiative. This is done to ensure that they are fully included, and appropriately addressed at the earliest appropriate stage of decision-making, on par with economic and social considerations[94]. It addresses issues of environment and sustainable development at their source in decision-making, rather than treating them as symptoms or adverse effects much later at the stage of project design. An OECD Guide to Understanding SEA in the development context provides some useful examples of the different types of tools that can be employed while carrying out SEA (https://www.oecd.org/environment/environment-development/37353858.pdf)

SEA aims to deliver the information necessary at the right time, to integrate the concept of sustainability into decision-making. It is a component of Integrated Environmental Management (IEM), which applies to the plan and programme stage of the development cycle.[95] Compared to other environmental assessment and management tools, SEA is usually seen as a higher-level tool in planning and at strategic levels as illustrated below;

[94] https://unece.org/fileadmin/DAM/env/eia/documents/SEAguides/Benefits_SEA_English.pdf
[95] https://www.tandfonline.com/doi/pdf/10.3152/147154600781767394

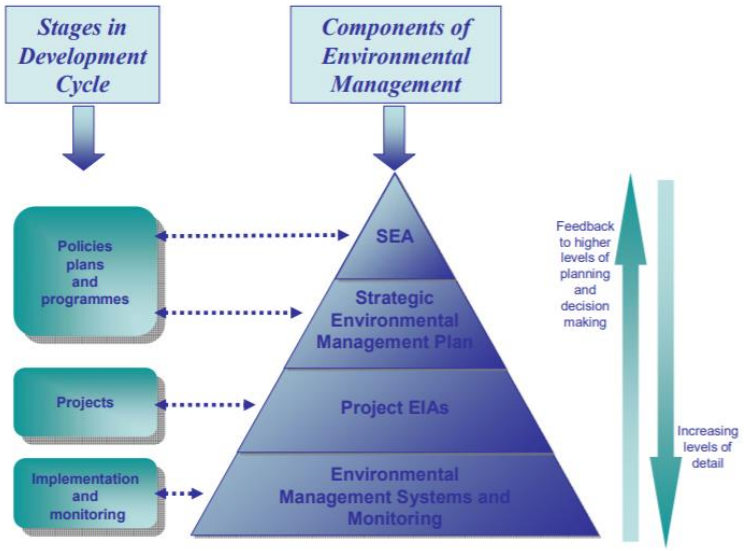

Figure 19 A tiered approach to SEA and other environmental instruments.

Important to note is that if a recent SEA study has already been prepared (either by the Government, or a Partner NGO working in the project area of interest), and the scope of the analysis and results are considered relevant and of satisfactory quality, the exercise can be limited to reviewing the findings of the SEA and integrating them into the ADRA office intended policy, plan or programme.[96]. Example of Plans and programmes that always require SEA are those that:

- Prepared for agriculture, forestry, fisheries, energy, waste management, water management and land use, or;
- Have been determined to require an assessment under the National Regulations.

• **Identification and formulation phase:** Identification and formulation need to consider the environment and climate change from the start. Important potential entry points include the problem and stakeholder analysis; environmental and climate change risk screenings and assessments on how sensitive a programme or action is; development of appropriate objectives, activities, indicators, and the necessary budget allocation for effective integration of climate change issues; budget support assessment framework (as budget support provides a powerful means for mainstreaming); and policy dialogue.

Environmental Impact Assessment is one of the common environmental assessment tools used at this phase, and in some instances at the implementation phase. The United Nations Environment Programme (UNEP) defines EIA as a 'systematic framework for identifying, predicting, and evaluating the environmental effects of proposed projects, considering inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment, and present the predictions and options to decision-makers.[97] With the use of an EIA across ADRA Development projects, both environmental and economic benefits can greatly be achieved. For example, the EIA process can help reduce the costs and duration of project implementation, avoid treatment/ clean-up costs, and comply with mandatory local/global environmental laws and regulations. Different from SEA, an EIA addresses the impact of

[96] https://europa.eu/capacity4dev/public-environment-climate/wiki/new-guidelines-integrating-environment-and-climate-change-eu-international-cooperation

[97]https://www.cbd.int/impact/whatis.shtml#:~:text=UNEP%20defines%20Environmental%20Impact%20Assessment,project%20prior%20to%20decision%2Dmaking.&text=Decision%2Dmaking%20on%20whether%20to,compliance%2C%20enforcement%20and%20environmental%20auditing.

development on the environment, while SEA focuses on the effect of the environment on development, as illustrated in the diagram below[98]

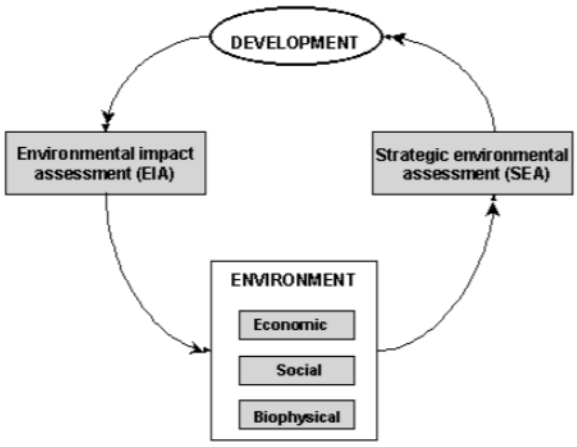

Figure 20 Difference between SEA and EIA.

Which project requires EIA? An EIA is required for all projects interventions that are likely to have a significant environmental impact on the environment, and are usually determined by;

- An environmental/climate screening process.
- National regulations or donor standards.

Different legislations govern the EIA process from country to country of ADRA operations, nonetheless, the fundamental components of an EIA would necessarily involve the following stages[99]:

a. **Screening** to determine which ADRA projects or developments require a full or partial impact assessment study;

b. **Scoping** to identify which potential impacts are relevant to assess (based on legislative requirements, international conventions, expert knowledge, and public involvement), to identify alternative solutions that avoid, mitigate or compensate adverse impacts on biodiversity (including the option of not proceeding with the development, finding alternative designs or sites which avoid the impacts, incorporating safeguards in the design of the project, or providing compensation for adverse impacts), and finally to derive terms of reference for the impact assessment;

c. **Assessment and evaluation of impacts and development of alternatives**, to predict and identify the likely environmental impacts of a proposed project or development, including the detailed elaboration of alternatives;

d. **Reporting the Environmental Impact Statement (EIS) or EIA report**, including an environmental management plan (EMP), and a non-technical summary for the general audience.

e. **Review of the Environmental Impact Statement (EIS)**, based on the terms of reference (scoping) and public (including authority) participation.

[98] https://www.tandfonline.com/doi/pdf/10.3152/147154600781767394

[99]https://www.cbd.int/impact/whatis.shtml#:~:text=UNEP%20defines%20Environmental%20Impact%20Assessment,project%20prior%20to%20decision%2Dmaking.&text=Decision%2Dmaking%20on%20whether%20to,compliance%2C%20enforcement%20and%20environmental%20auditing.

f. **Decision-making** on whether to approve the project or not and under what conditions; and

g. **Monitoring, compliance, enforcement, and environmental auditing**. Monitor whether the predicted impacts and proposed mitigation measures occur as defined in the environmental management plan (EMP). Verify the compliance of the proponent with the EMP, to ensure that unpredicted impacts or failed mitigation measures are identified and addressed in a timely fashion.

To effectively apply the above stages, an ADRA office needs to come up with an EIA tool that will guide the process. Some of the example tools that an ADRA office could adopt include; Tear Fund Environmental assessment For use on medium-impact projects (EA current.indd (tearfund.org), or the USAID Environmental Impact Assessment Tool (EIA Tool_Revised_4Dec2017_FINAL.pdf (usaidgems.org).

When it comes to a humanitarian setting, several tools exist for conducting EIAs. These tools include; the Environmental Stewardship Review for Humanitarian Aid, the Rapid Environmental Impact Assessment in Disasters, the Flash Environmental Assessment Tool, and the Environmental Needs Assessment in Post-Disaster Situations. Examples of some of these analytical tools that can be used to determine the environmental impacts of post-disaster recovery and reconstruction projects include the following;

- Guidelines for Rapid Environmental Impact Assessment in Disasters: https://eecentre.org/wp-content/uploads/2018/01/REA_2018_final-6.pdf
- Environmental impact assessment tools and techniques: https://www.sheltercluster.org/sites/default/files/docs/GRRT%203%20-%20Environmental%20Impact%20Assessment%20Tools%20and%20Techniques.pdf
- Environmental Needs Assessment in Post-Disaster Situations https://wedocs.unep.org/bitstream/handle/20.500.11822/17458/env_needs_assmt_post_disaster.pdf?sequence=1&isAllowed=y

Additionally, UNEP's guide for selecting and implementing appropriate environmental assessment frameworks dubbed, "An Introduction to Environmental Assessment", gives an overview of available frameworks, including those most commonly used by UNEP. It further guides on selecting appropriate frameworks, introduces common terms and concepts, and provides illustrative examples.

(http://apps.unep.org/publications/index.php?option=com_pub&task=download&file=011945_en)

Further, important to note for ADRA offices, is that climate change considerations may form an important part of the Environmental Impact Assessment (EIA) of a project. As such, its considerations should be part of the EIA process, as described in chapter 5 of the European Union technical guidance on the climate proofing of infrastructure in the period 2021-2027.

(https://ec.europa.eu/clima/sites/default/files/adaptation/what/docs/climate_proofing_guidance_en.pdf)

• **Implementation phase:** Significant opportunities exist during the implementation phase to enhance a programme/project's CCA and CCM performance. Entry points include preparation of contractual documents; monitoring and evaluation and steering mechanisms; and policy dialogue.

• **Evaluation phase:** In the evaluation phase, the CCA and CCM performance of programmes and projects can be assessed and lessons drawn for future operations. Entry points include mid-term and final evaluations, and policy dialogue of evaluation results.

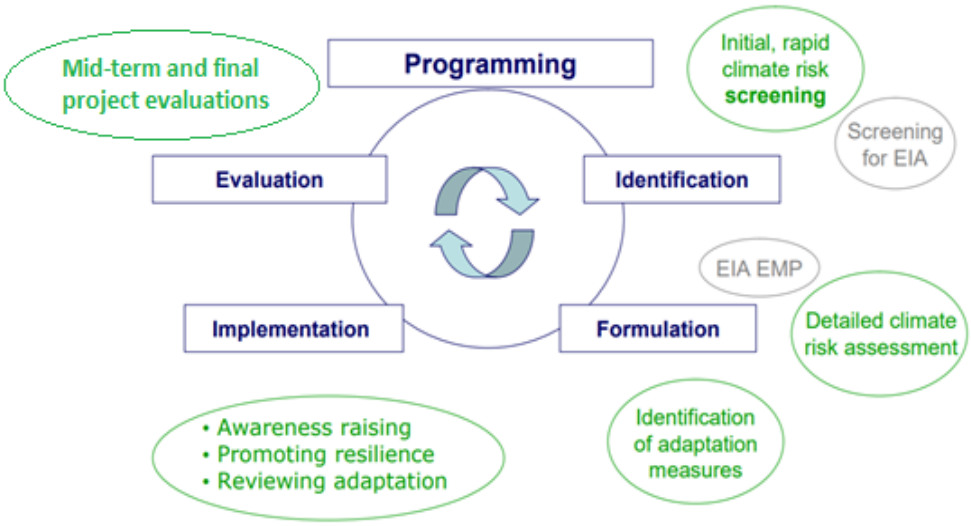

Figure 21 Environmental consideration across the project cycle.

5. Step by Step Guide to reduce GHG-Emissions at ADRA Offices

A carbon footprint is the total amount of greenhouse gas emissions (GHG) that comes from the production, use and end-of-life of a product or service. It includes carbon dioxide — the gas most commonly emitted by humans — and others, including methane, nitrous oxide, and fluorinated gases, which trap heat in the atmosphere, causing global warming [100]. According to the European commission causes of climate change, CO_2 is responsible for 64% of man-made global warming.[101] Its concentration in the atmosphere is currently 40% higher than it was when industrialization began. Other greenhouse gases are emitted in smaller quantities, but they trap heat far more effectively than CO_2, and in some cases are thousands of times stronger. Methane is responsible for 17% of man-made global warming, nitrous oxide for 6% while other gases account for 13%.

The 16th edition of the Climate Risk Index clearly shows that signs of escalating climate change can no longer be ignored – on any continent or in any region. According to the recent reports, the countries most affected in 2019 were Mozambique, Zimbabwe as well as the Bahamas, and for the period from 2000 to 2019 Puerto Rico, Myanmar and Haiti ranked the highest.[102] Further, it is projected that the Arctic, Africa, small islands and Asian Mega deltas are regions that are likely to be especially affected by future climate change.[103]

Although NGOs like ADRA are not viewed as polluters and are certainly not targets of regulations aimed at reducing GHG emissions, the global carbon budget indicates that everyone must reduce their climate impact,[104] and thus need to be part of the solution. The success of ADRA's contribution to this noble cause lies entirely on its staff. What this means is that the pathway to reducing the global carbon footprint by ADRA, starts with an individual (staff). This is because, the behavior change aspect at a personal level, is an essential one, that gives a staff firsthand experience of what it means to be part of the bigger solution. As a result, this may not only lead to staff being an early adopter of the recommended green practices, but he/she also easily becomes an influencer and change agent.

The methodologies and ideas for reducing an ADRA's office GHG emissions presented in this guide are simple and straightforward. As such, users may not necessarily need any advanced statistics or environmental skills and knowledge to grasp the concepts. However, climate change enthusiasm, knowledge on the use of excel program, and basic mathematics will help internalize some sections of the guide. The guide walks the user through 6 simple steps that one can take, to implement an organizational commitment and strategies in reducing CO_2 emissions in one's ADRA country offices.

- **Step 1: Setting up the GHG reduction project initiative**

For successful implementation of an effective GHG reduction initiative, there must be management buy-in and support, more so from the top management. Changes in organizational behavior are going to be necessary for the successful implementation of the GHG reduction initiative. This should be spearheaded by top management through establishing an internal accountability and incentive system to achieve the target.

[100] https://www.nytimes.com/guides/year-of-living-better/how-to-reduce-your-carbon-footprint
[101] https://ec.europa.eu/clima/change/causes_en
[102] https://germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_1.pdf
[103] https://www.cbd.int/doc/pa/tools/Intergovernmental%20Panel%20on%20Climate%20Change.pdf
[104] https://www.goldstandard.org/content/pop-tell-me-why-i-should-offsetting#:~:text=The%20global%20carbon%20budget%20indicates,reduce%20their%20own%20climate%20impact.&text=By%20funding%20emission%20reductions%20through,catastrophic%20effects%20of%20climate%20change.

An ADRA Office should specifically consider the following action points;

- **ADCOM Approval.**

The decision for an ADRA Office to become Carbon neutral organization (milestone year can be added as a goal and reflected in organization strategy) should be presented to ADCOM for discussion and agreement by the by CD, programs, finances, logistics, communication & IT departments. Additionally, in some instances, ADRA Board approval might be necessary, and especially when some action points may require an ADRA office to adopt a new policy.

- **Designate climate change champions (CCC), to guide and steer the initiative.**

Climate change champions (CCC) are motivated and dedicated employees, who are selected to lead the carbon reduction initiative in an ADRA office. The number of CCC members can vary based on the size of the available office staff. The CCC play a crucial role in making the case for change, and providing leadership during the change process towards carbon reduction efforts (neutrality). Enthusiasm is the most important criterion for selecting the climate champions in the organization, and thus, they do not necessarily have to come from the programs department, or be individuals with environmental background. Nevertheless, skillful communication (both orally and in writing) will be a necessity, since the CCC team members will need to work closely with staff members, in sharing findings and the initiative progress to the organization.

- **Conduct Office Emission Baseline.**

Baseline emissions refer to the production of greenhouse gases that have occurred in the past, and which are being produced before the introduction of any strategies to reduce emissions.[105] The baseline measurement is determined over a set period, typically one year. This measurement acts as a benchmark to evaluate the success of subsequent efforts to reduce emissions. Without the knowledge of baseline emissions, it is impossible to reliably judge the success of any remediation efforts. In this regard, an ADRA office needs to understand the extent of its office emissions, by developing a baseline, that will be used as the foundation for its carbon neutrality roadmap. Further, important to note is that, this baseline/GHG emissions assessment should be conducted annually, using the same calculation tools. Additionally, the CO_2 emission factors need to be reviewed and updated regularly. A list of freely accessible emission factors databases is later highlighted in this chapter.

- **Establish a plan stipulating commitment to reducing office GHG emissions in ADRA Office and in projects.**

For an ADRA office to have clarity of direction, and a well-defined set of initiatives that will enable the organization to meet its set carbon reduction targets, it is important that a plan stipulating the commitments to reducing its GHG emission is developed. Typically, the plan should describe the organization's actions towards becoming carbon neutral i.e. the goals (preferably, for each goal, a measure should be stated to identify the expected improvement as a result of the actions), timeframe for achieving the goal (there should be enough time given to achieve the goal and realize the benefits of the project), and carefully defined actions to achieve the goals set by the organization. It is recommendable that the plan is signed off by a senior member of the ADCOM (preferably the Country Director), to demonstrate the importance and commitment of the organization to the set plan. The screenshot below is an example of some of the proposed actions to reduce logistics emissions from ADRA Sweden's action plan.

[105] https://www.encyclopedia.com/environment/energy-government-and-defense-magazines/baseline-emissions

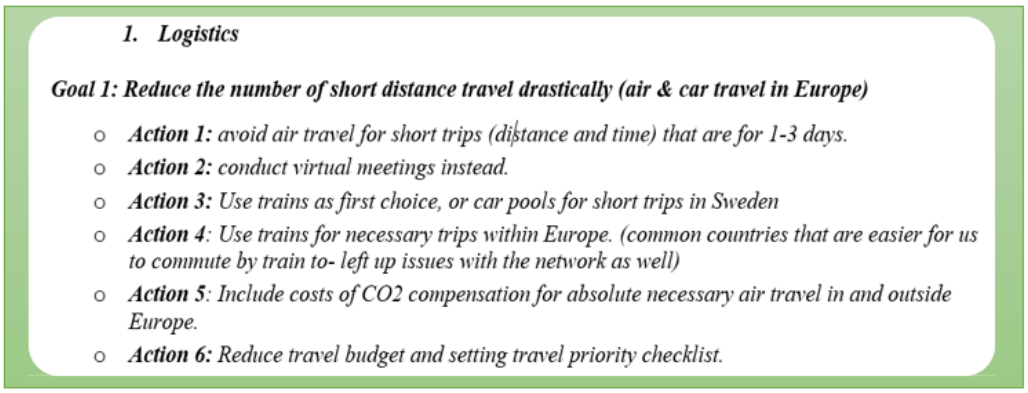

Figure 22 ADRA Sweden action plan to reduce emissions from logistics

- **Financial backing through a budget allocation to support the initiative for admin/office and ground rules for integrating this component into the projects.**

To successfully implement your ambitious organization's plans and commitments towards reducing GHG emissions, securing a financial backing/ funding source is essential. Ideally, an organization would develop a budget providing clear information related to the activities, staff time required, among other resources required for the initiative actions outputs e,g, energy-efficient bulbs, solar panels, etc. To get a quicker buy-in from the management (funding source), the budget should indicate the costs and savings associated with the GHG reduction activities. If done properly, the adoption of this budget by management will send a clear signal that GHG reduction is an organizational priority relative to other objectives, and provides a funding mechanism for implementing the carbon reduction strategies on a better long-term financial footing.

- **Establishing or purchasing Carbon credits as an income source or as a balancing mechanism (Optional).**

A carbon credit is a permit that allows an organization that holds it, to emit a certain amount of carbon dioxide or other greenhouse gases. One credit permits the emission of a mass equal to one ton of carbon dioxide.[106] Purchasing carbon credits is an optional way to show accountability for the created climate impact, and take climate action beyond ADRAs area of influence. Therefore, if an ADRA office decides to purchase carbon credits, they should be certified as having met the widely recognized standards like the "Gold Standard" or the "Climate, Community and Biodiversity Standards". Additionally, an ADRA office could capitalize on the carbon values of their current or planned projects (such as those promoting fuel-efficient stoves and sustainable agriculture/natural resource management), that either involve reducing global GHG-emissions or sequestering GHGs, where these values can be converted into carbon credits and sold to other entities or to ADRA itself.

Once the management has approved the initiative, an undertaking to reduce GHG emissions in the office should be carried out like any other significant project in the organization.[107] As such the application of standard project management principles such as measurement and accountability, careful budgeting, realistic scheduling, maintaining organization alignment and managing changing priorities, will be necessary. Below is an example of a checklist that can be used to ensure all key steps involved in setting up the project initiative have been completed.

[106] https://web.archive.org/web/20100912151614/http://www.epa.vic.gov.au/climate-change/glossary.asp
[107] https://walga.asn.au/getattachment/Policy-Advice-and-Advocacy/Environment/Climate-Change/Climate-Change-Resources/Project_Manager-s_Guide_to_Greenhouse_Gas_Emissions_Feb2016.pdf.aspx?lang=en-AU

Have the following been completed?	Y	N
1. Has the GHG reduction commitment by the ADRA office management been agreed on?		
2. Have the initiative expectations and outcomes been identified?		
3. Do we have a contact person for the initiative?		
4. Have the Climate Change champions been selected?		
5. Have the champions' roles and responsibilities been defined and agreed upon?		
6. Has the budget for the initiative been agreed upon and approved?		
7. Has the initiative plan been prepared and agreed on (milestones and deliverables)		
8. Has the initiative outcomes communication plan been prepared?		

Table 6 Setting up GHG initiative checklist

- **Step 2: Take stock of your GHG inventory**

Once all the above steps highlighted in the checklist have been completed, all GHG emissions sources resulting from an ADRA Office admin activities can now be identified by the CCC team. This can be achieved, through the following key action points.

- **Defining boundaries for the inventory.** Simply, this means deciding which activities and associated emissions will be part of the inventory. i.e.; identifying emissions associated with the ADRA admin operations such as those from fuel consumed during travel by staff, generation of electricity, heat, or steam, as well as electricity consumed during business hours and office equipment.

- **Categorizing Emissions.** Once the emissions arising from the ADRA office operations and activities have been identified, the emissions list is later categorized into either Direct Emissions or Indirect Emissions.
  - **Direct emissions** are emissions within the inventory boundary from sources that ADRA owns or controls, like staff travel to meetings, transport in an ADRA-owned car, combustion of fuel in ADRA-owned boilers and furnaces. The GHG Protocol requires that direct emissions be accounted for and reported. For reporting purposes, direct emissions are called **"scope 1" emissions**.

  - **Indirect emissions** result from ADRA's activities, but they are from sources not owned by ADRA or, they are controlled by another company. A good example is emissions from travel: If an ADRA staff commutes to a meeting using public transport means e.g. a bus, the emissions are indirect for the ADRA office, because the emission source – the bus – is not owned or controlled by ADRA. For reporting purposes, indirect emissions are divided into **"Scope 2" and "Scope 3"** categories. Examples of common ADRA emission sources are illustrated in the table below, as referenced from the ADRA-CO_2calculation tool;

Emission Category	Emission Sources
SCOPE 1 Emissions	GHG Emissions from Stationary Sources (Boilers, Furnaces, Ovens, Diesel Generators, Charcoal) GHG Emissions from Passenger Vehicles (owned or controlled cars and/or motorbikes) HFC and PFC Emissions from Refrigeration / Air-conditioning Equipment
SCOPE 2 Emissions	GHG Emissions from Purchased Electricity, Steam, Heating, and Cooling

SCOPE 3 Emissions	Business Travel – Air Business Travel – Land and Sea Business Travel – Hotel stay Waste Disposal – Mixed Paper and Board

Table 7 GHG emissions categories

Once the inventory boundaries have been defined and emissions resulting from ADRA admin activities categorized, a GHG inventory checklist can be used in ensuring that all key steps involved in the GHG emissions stocktaking at the ADRA office have been completed;

Have the following been completed?	Y	N
1. Has the ADRA office GHG emission inventory boundaries been defined?		
2. Has the ADRA office Admin activities resulting to GHG emissions been categorized into relevant Scopes 1, 2 and 3 emissions?		

Table 8 GHG emissions inventory checklist

- **Step 3: Gather and calculate your GHG emission data.**

Now that you have taken a stock of your ADRA Office GHG inventory, this step will now assist you, in identifying what kind of data is needed to populate the GHG inventory, where to locate it, and how to calculate it

- **What kind of data is needed;** To populate your inventory, two kinds of data are required for each emissions source identified in Step Four i.e. the Activity Data and Emissions Factor.
  - **Activity Data** is a quantitative measure of a level of activity (e.g. liters of fuel consumed, kilometers traveled, kilowatt-hours of electricity, etc.) that results in GHG emissions, while;
  - **Emission Factor** is a factor that converts the activity data into GHG emissions data (e.g. kg CO_2 emitted per liter of fuel consumed, kg CH_4 emitted per kilometer traveled, etc.) as referenced from the ADRA-CO_2calculation tool screenshot below.

TABLE 2: GHG Emissions from Passenger Vehicles (owned or controlled cars /motorbikes)

Office_ID	Fuel Type	Type of Vehicle	Quantity / Milage	Units	Emissions Factor (kgCO2e)	GHG-Emissions (tCO2e)
ADRA_xyz	Diesel_Blend		1000	Liter	2,62694	2,627
ADRA_xyz	Electric	Renault Fluence	10000	km	0,0609	0,609

Activity Data **Emission Factor**

Figure 23 Example of where to locate Emission Factors

A list of emissions factor sources is contained in the ADRA-CO_2Calculation-Tool ADRA CO2 Calculation Tool_0.7.x Additionally, one can also find emissions factors from freely accessible databases such as;

- Emission Factor database (https://emissionfactors.com/)
- DEFRA emission factor database (https://ghgprotocol.org/Third-Party-Databases/Defra)
- IPCC emission factor database (https://www.ipccnggip.iges.or.jp/EFDB/find_ef.php?reset=)
- IGES emission factor database. (https://www.iges.or.jp/en/pub/iges-ghg-emissions-data-0/en)

The emissions factors in these databases are frequently updated to reflect new information, and as such, are recommendable for use (The DEFRA conversion factors is a standard database used by many organizations, and updated regularly). Users may also acquire up-to-date emission factors from published sources by various entities such as local, state, or national government agencies as well as intergovernmental agencies.

- **Where to locate your GHG inventory data:**

The following list provides an example of common data sources that the CCC team may refer to, while gathering data for the GHG inventory.

- Office electricity bills
- Vehicle mileage information
- Invoices for purchased printing papers
- Receipts of liquid fuels purchased (e.g. diesel, petrol)
- Detail reports of any offsets purchased in the year, if applicable.
- Make and model of all vehicles owned and operated by the office
- Office fuel card details that include the type of fuel consumed (if applicable)
- Records all the official flight receipts, taxis receipts, etc. for scope 3 emissions.
- For commute of employees to office as well as for staff travel related to admin tasks, the annual questionnaire could be a more appropriate solution. For work commute employee would have to define how many km and how many days he/she travel and what kind of transport & fuel was used. For Admin-related staff travel; data on the number of travel days, route, kind of transport & type of fuel, hotel stay locations would be required.

It is important that one knows what type of data is needed annually and where to locate it. Therefore, from the list above, it is evident that good record keeping is fundamental in making it easier to access GHG data sources both at the present year and consequent years of GHG inventory process. Therefore, this brings about the issue of both data management and the quality of the inventory data.

With regards to data management, each office will have to determine where and how the GHG-related records will be stored. A computerized or electronic filing system such as online cloud storage, local storage (computers, laptops, or servers and hard drive) is recommended, given the importance of waste reduction. However, the decision on which type of data management system to be adopted will be based on factors such as overall cost in acquiring and maintaining the preferred management system, available capabilities in developing and managing the system such as the online databases, and/or frequency of access to the GHG data. Nevertheless, regardless of the choice, a proper data management system should ensure that the GHG data is easily accessible, and well organized for ease of data retrieval.

The GHG inventory is only as good as the quality of data that it contains. As such, on the second issue regarding the quality of the GHG inventory data, an ADRA office should ensure that a designated CCC staff is trained adequately so that he/she understands what information needs to be collected, where to find, and to store it. The CCC will also need to ensure that the data is collected efficiently from year to year, despite any changes in the organization staff member. Additionally, internal controls need to be incorporated into the data collection system, to capture any errors. Examples of these technical errors could be; incorrect units, incorrect emission factors used, and mistakes in data entry. Chapter 7 of the GHG Protocol's Corporate Accounting and Reporting Standard [108], provides detailed information on managing inventory quality. Finally, where raw GHG data is hard to locate or unavailable, staff can use assumptions based on estimated use and make a justification to support the assumption made**.**

[108] https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

- **How to calculate your GHG emissions:**

Once all the data on activity and emission factors have been gathered, the CCC team can now calculate emissions emanating from their office operations. There are several calculation methods used to calculate GHG emissions, based on accepted formulas and models. The most common formula to calculate GHG emissions is by applying the documented emission factors, to a known activity data found in your office. i.e. **Activity Data * Emission Factor = GHG emissions**

Even though the calculation looks simple and straightforward, it can get complex and time-consuming, especially when the office GHG emission inventory data increases. Below is an example of the formula application, in the calculation of "Scope 2" GHG emissions, emitting from purchased electricity by the ADRA Netherlands office.

Example: In the union building where ADRA Netherlands operates, activity data obtained from the electric bill indicates that the electricity usage for the building in 2018 was 34,847kWh. ADRA Netherlands rents two rooms in the building occupying 65m^2 of the total building area, which is 1,564 m^2. Calculate the GHG emissions resulting from the use of electricity by the ADRA office in 2018 (as baseline year).

Step1: We estimate ADRA Netherlands approximate share of kWh in union building:

(Area of organization's space ÷ Total building area) × Total building usage of electricity = approximate kWh used by your organization

(65m^2 ÷ 1,564 m^2) × 34,847kWh = **1,448kWh**

Step 2: We calculate ADRA Netherlands GHG emissions resulting from its electricity usage, using the emission factor of 0,6455 $kgCO_2e$/kWh.

Activity Data (Electricity Usage) × (Emission Factor) = emissions ($kgCO_2e$/yr.)

1,448 kWh/yr. × 0.435 $kgCO_2e$/kWh = **629.88 $kgCO_2e$/yr.**

Step 3: Unit conversion from kilograms of CO_2 ($kgCO_2$) to metric tons of CO_2 (tCO_2), as it is the common unit for GHG emission reporting

CO_2 ($kgCO_2$) ÷ 1000 = CO_2 (tCO_2)

629.88 $kgCO_2e$ ÷ 1000 **= 0.63 tCO2e/yr.**

From the above example, it's obvious that the calculation might require high concentration, and as such, it is prone to common errors such as using an incorrect emission factor or unit conversion errors. For example, if your activity data are units of natural gas, then your emission factor must be for natural gas, and not an emission factor for other forms of energy, or, multiplying activity data expressed in kilometers, by an emission factor expressed in miles. Further, another common error would be in the conversion of the common unit for reporting emissions, which is usually in metric tons that often also requires a unit conversion.

It is in this light, that this guide recommends the use of the customized ADRA- CO_2 Calculation-Tool Version 1.0, in the calculation of GHG emissions by an ADRA office. Using the ADRA Netherlands GHG emission calculation example, below is a screenshot of how simple and straightforward the calculation process would be, using the ADRA-CO_2 Calculation-Tool.

TABLE 4: GHG Emissions from Purchased Electricity, Steam, Heating and Cooling						
Office_ID	1 Electricity used in the building(s) (kWh)	2 Total Area of Building(s) (m2)	3 Total Area of the ADRA-office (m2)	4 Electricity used by ADRA-Office (kWh)	5 Emissions Factor (kgCO2e)	6 GHG-Emissions (tCO2e)
ADRA_Germany	29,331	3,359	3,359	29,331	0.000	0.00
ADRA_Netherlands	34,847	1,564	65	1,448	0.435	0.63
ADRA_Sweden	67,408	1,650	100	4,085	0.023	0.09
ADRA_Sweden	267,340	2,050	100	13,041	0.023	0.30
ADRA_Madagascar	18,500	768	768	18,500	0.463	8.57

Figure 24 Example of GHG emission calculations using ADRA Carbon calculation tool

From the excel table, it would only require a user to input the correct activity data as highlighted on the cells numbered 1,2, and 3. The emission factors in cell number 5 are prepopulated in kg of carbon dioxide equivalents ($kgCO_2e$), and this is from a validation table within the excel program. The emission is then automatically calculated by multiplying the electricity used by ADRA Netherlands (kWh), by the emission factor in cell number 4. The calculated aggregated emissions results are then automatically converted to tonnes of carbon dioxide equivalents (tCO_2e), as shown in cell number 6. The screenshot below is a singled-out example of GHG emission measurements from ADRA Madagascar admin operations for the 2018 baseline year. (Notice how the office has laid out its monthly kWh, and how this can make it easy in computing the final year analysis).

TABLE 4: GHG Emissions from Purchased Electricity, Steam, Heating and Cooling						
Office_ID	Electricity used in the building(s) (kWh)	Total Are of Building(s) (m2)	Total Area of the ADRA-office (m2)	Electricity used by ADRA-Office (kWh)	Emissions Factor (kgCO2e)	GHG-Emissions (tCO2e)
ADRA_MAD	24.08854167	768	768	18500	0.436	8.066
					TOTAL	8.066
Months (2018)	**kWh**					
January	1524.00					
February	1832.00					
March	1595.00					
April	1465.00					
May	1480.00					
June	1560.00					
July	1517.00					
August	1312.00					
September	1478.00					
October	1326.00					
November	1695.00					
December	1716.00					
TOTAL	18500.00					

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Figure 25 GHG emission calculation from ADRA Madagascar admin operations

From the screenshot above, it is therefore recommendable, that an ADRA office ensures a monthly or quarterly data registration of the required inputs across the tool. The end result of this, is that the CCC team will have an easy time during the final analysis of the total GHG data, as further evidenced by another example from ADRA Madagascar below;

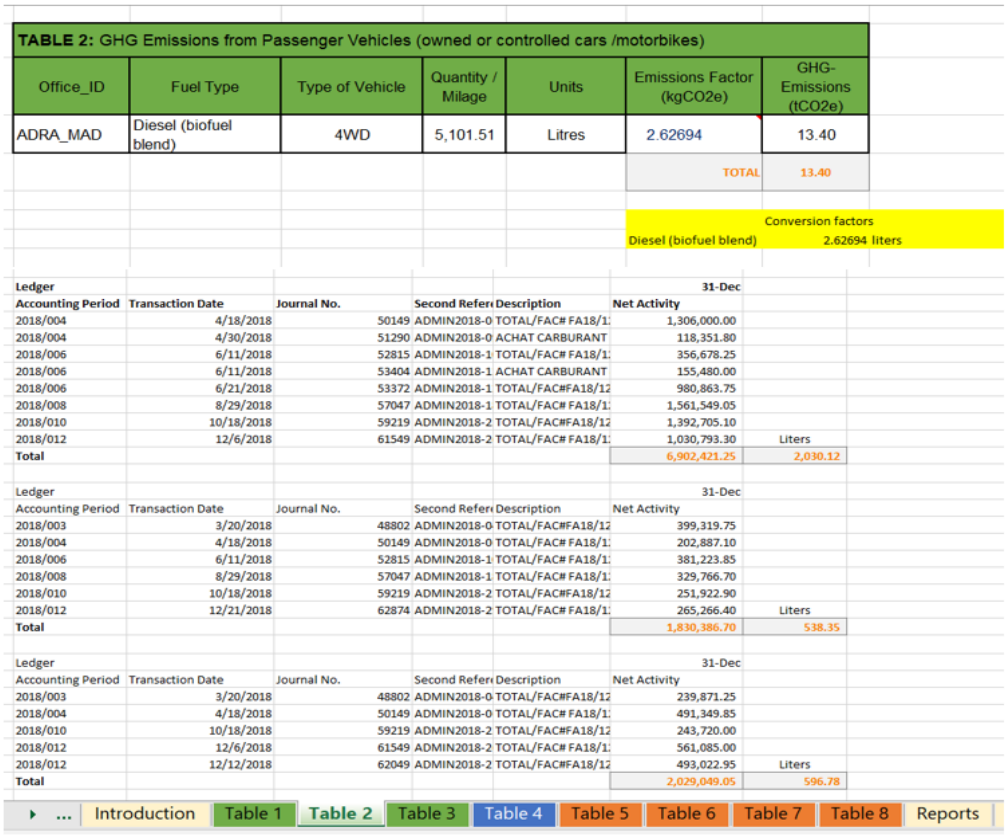


TABLE 2: GHG Emissions from Passenger Vehicles (owned or controlled cars /motorbikes)

Office_ID	Fuel Type	Type of Vehicle	Quantity / Milage	Units	Emissions Factor (kgCO2e)	GHG-Emissions (tCO2e)
ADRA_MAD	Diesel (biofuel blend)	4WD	5,101.51	Litres	2.62694	13.40
					TOTAL	13.40

Conversion factors		
Diesel (biofuel blend)	2.62694	liters

Ledger					31-Dec	
Accounting Period	Transaction Date	Journal No.	Second Refer	Description	Net Activity	
2018/004	4/18/2018	50149	ADMIN2018-0	TOTAL/FAC# FA18/1	1,306,000.00	
2018/004	4/30/2018	51290	ADMIN2018-0	ACHAT CARBURANT	118,351.80	
2018/006	6/11/2018	52815	ADMIN2018-1	TOTAL/FAC# FA18/1	356,678.25	
2018/006	6/11/2018	53404	ADMIN2018-1	ACHAT CARBURANT	155,480.00	
2018/006	6/21/2018	53372	ADMIN2018-1	TOTAL/FAC#FA18/12	980,863.75	
2018/008	8/29/2018	57047	ADMIN2018-1	TOTAL/FAC# FA18/1	1,561,549.05	
2018/010	10/18/2018	59219	ADMIN2018-2	TOTAL/FAC#FA18/12	1,392,705.10	
2018/012	12/6/2018	61549	ADMIN2018-2	TOTAL/FAC# FA18/1	1,030,793.30	Liters
Total					6,902,421.25	2,030.12

Ledger					31-Dec	
Accounting Period	Transaction Date	Journal No.	Second Refer	Description	Net Activity	
2018/003	3/20/2018	48802	ADMIN2018-0	TOTAL/FAC#FA18/12	399,319.75	
2018/004	4/18/2018	50149	ADMIN2018-0	TOTAL/FAC# FA18/1	202,887.10	
2018/006	6/11/2018	52815	ADMIN2018-1	TOTAL/FAC# FA18/1	381,223.85	
2018/008	8/29/2018	57047	ADMIN2018-1	TOTAL/FAC# FA18/1	329,766.70	
2018/010	10/18/2018	59219	ADMIN2018-2	TOTAL/FAC#FA18/12	251,922.90	
2018/012	12/21/2018	62874	ADMIN2018-2	TOTAL/FAC# FA18/1	265,266.40	Liters
Total					1,830,386.70	538.35

Ledger					31-Dec	
Accounting Period	Transaction Date	Journal No.	Second Refer	Description	Net Activity	
2018/003	3/20/2018	48802	ADMIN2018-0	TOTAL/FAC#FA18/12	239,871.25	
2018/004	4/18/2018	50149	ADMIN2018-0	TOTAL/FAC# FA18/1	491,349.85	
2018/010	10/18/2018	59219	ADMIN2018-2	TOTAL/FAC#FA18/12	243,720.00	
2018/012	12/6/2018	61549	ADMIN2018-2	TOTAL/FAC# FA18/1	561,085.00	
2018/012	12/12/2018	62049	ADMIN2018-2	TOTAL/FAC#FA18/12	493,022.95	Liters
Total					2,029,049.05	596.78

... Introduction | Table 1 | Table 2 | Table 3 | Table 4 | Table 5 | Table 6 | Table 7 | Table 8 | Reports

Figure 26 GHG emission monthly entries - ADRA Madagascar

Overview and description of the ADRA-CO_2Calculation-Tool

The ADRA-CO_2Calculation-Tool tool was created to facilitate and standardize GHG inventories of all ADRA offices. This interactive Excel-based program is made up of several spreadsheets, some relating to GHG emissions information being reported, actual GHG emission calculations and aggregation of GHG data, some default emission factors, conversion tables, among other important basic information on GHG emissions. The calculation tool contains instructions on how to fill out the worksheets in the workbook, therefore making it easy to use and interact with. The tool is consistent with the GHG Protocol Corporate Standards approaches, and its development was guided by the GHG Protocol; Designing a Customized Greenhouse Gas Calculation Tool Handbook,[109] hence compliant with the international standards for GHG emission calculations.

ADRA CO2 Calculation Tool_0.7.x

To make you more familiar with the applications of this tool, below is another example, of how GHG emission from passengers' vehicles (one of the common offices scope 1 emission sources), is calculated using the ADRA-CO_2 calculation tool:

[109] https://www.wri.org/research/designing-customized-greenhouse-gas-calculation-tool

ADRA office has diesel blend and electric vehicles (vehicles officially owned by ADRA). From the vehicle using diesel blend, an ADRA office used 1000 liter in the baseline year and with the electric vehicle drove 10.000km in the same baseline year. The following calculation will then apply for the baseline year:

TABLE 2: GHG Emissions from Passenger Vehicles (owned or controlled cars /motorbikes)						
Office_ID	Fuel Type	Type of Vehicle	Quantity / Milage	Units	Emissions Factor (kgCO2e)	GHG-Emissions (tCO2e)
ADRA_xyz	Diesel_Blend		1000	Liter	2,62694	2,627
ADRA_xyz	Electric	Renault Fluence	10000	km	0,0609	0,609

Figure 27 Example of GHG emission calculation from ADRA Passenger Vehicles

The figure above displays an example of emissions activity calculations, that applies to most ADRA offices day to day logistics operations. What one needs to note, is that logistics among other things involves procurement activities. This according to the ADRA activities, falls under scope 3 emissions[110]. Calculating supply chain emissions is no easy task, as it requires a vast amount of data, given that these emissions are wide and varied. Therefore, it would have taken long before the automation of the entire calculation process is embedded in the tool, against the project time limit. Nonetheless, in the interest of the theoretical aspects of the calculation involved, there are two main methods to calculate supply chain emissions:

1. **Spend-based method**: Centered around the economic value of purchases. The expenditure for every purchased good or service is multiplied by a relevant emission factor (highly preferred, given that every purchase is recorded in the organization accounting system and can be easily exported)
2. **Activity-based method**: Relies upon data tracked within the organization or provided by suppliers. Activity data, like the liters of fuel burnt by a supplier truck making a delivery, are multiplied by the corresponding emission factors (Gathering the data required for an activity-based assessment can take a very long time, and many suppliers might not even know how much they emit making it less common by most organization).

Therefore, based on the principal formula of carbon emission calculation, the use of either of these two methods, makes it easy to calculate emissions associated with the procurement of a good or a service. See below;

∑ (value of purchased good or service ($) × emission factor of purchased good or service per unit of economic value (kg CO2 e/$). = **Total Procurement emission (tCO2e/yr)**

Procurement activities contribute the highest GHG emissions outside the direct control of most humanitarian and development agencies such as ADRA. Therefore, it is paramount that a solution is developed to overcome the barrier to the measurement challenges posed by these activities. One key solution around this would be an ADRA office finding the right supplier(s), with sustainability compliance practices. This solution is as important as measuring procurement emissions by an ADRA office, as it provides an opportunity for the office to engage with suppliers who either measure/disclose their emissions, or have set up policy measures to reduce emissions in their production activities. As such, the result of this type of engagement means sustainable and green purchasing, hence, preventing ADRA from inheriting suppliers' emissions, which they would have to account for, by calculating and reporting the emissions.

Below are examples of questions, that an ADRA procurement office may adopt, as a starting point to understanding the GHG emissions across their supply chain, whilst engaging their suppliers, in the organization's race towards becoming carbon neutral. Essentially, the questionnaire collects baseline information about a supplier's environmental consciousness and GHG emissions from their operations, as well as, any related policies and practices they may have in

[110] https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporing-Standard_041613_2.pdf

place to mitigate them. Information provided in this questionnaire will help ADRA quantify their Scope 3 emissions, assess their climate risk across supply chains, and take steps to mitigate supply chain emissions in partnership with their key suppliers. ADRA offices seeking additional information from suppliers can modify sample questionnaire as necessary;

ADRA SUPPLIER SELF-ASSESSMENT QUESTIONNAIRE (SAQ)

Building the foundation for Green supply chains

Supplier: ……

Contact person ……

Date……

Questions	Yes	No	Comments
A. Environmental Management			
1. Does your company have a formal environmental policy in place? (If yes, please share a copy of the policy)			
2. Does your company have a certificate issued by an approved certification body, e.g. ISO 14001:2004 or an equivalent standard? (If so, please attach a copy of such certification)			
3. Is your company aware of and does comply with the environmental laws applicable to your activities?			
4. Does any of your company's products include eco-labels? (if so, please attach a copy of the certificate).			
5. Does your company have established targets/goals regarding the reduction, reuse, and recycling of the packaging of your products? (If yes, please attach a copy)			
6. Do you request any environmental compliance certificates from your suppliers? (If yes, please indicate which)			
7. Does your company have a policy on responsible sourcing of raw materials?			
B. Greenhouse Gas (GHG) Emissions and Energy Usage			
1. Have you calculated the carbon footprint of your company or any of your products? (If yes, please share the report of your emissions for the most recent year measured)			
2. Does your organization have goals and targets to reduce GHG emissions? (if yes, please name them)			
3. Does your company have initiatives to use renewable energy (e.g. biomass, solar, wind, or purchase renewable energy certificates)			
4. Please disclose if your company tracks energy consumption, which includes purchased electricity. If you do track energy consumption, please describe how it is tracked (e.g., frequency and method of tracking) and the uses of the data internally			

5. Does your company currently work on any environmental or carbon initiatives that were not asked about in this questionnaire?			

- **Step 4: Develop a GHG emissions reduction target for your office.**

Now that you have measured and started to calculate (or you have calculated) your office GHG emissions, setting an emission reduction target is the next logical step. This step entails choosing among various targets, for defining a desired GHG reduction goal for the office. Therefore, it necessitates an engagement discussion by all the CCC staff, including the senior management.

Why should your office develop the GHG targets?

- **Leadership:** Establishing a target and making it known communicates to donors, staff members, ADRA network, etc., that your office's commitment to reducing global warming emissions.
- **Planning:** A target is useful to plan your office reduction activities, as well as, a useful rallying point for both management and staff.
- **Performance and tracking:** Once you have set a target, you will have a goal to strive for and a benchmark against which to assess your GHG performance each year.
- **Cost savings:** A target provides a focal point around which to plan and implement emission reduction activities. Implementing actions to achieve a GHG target can save money by using resources more efficiently.

There are two types of GHG reduction targets that your office might choose from:

A. **Absolute Target;** This GHG target is usually expressed in terms of a reduction over time, in a specified quantity of GHG emissions to the atmosphere, the unit typically being tones of CO_2-e.[111] It is simply a target that compares the office's total GHG emissions in the target year, to those in a base year, and does not consider other factors such as the growth of the ADRA office in terms of staff members and/or size of its operations.

   To establish an emissions reduction target, the first step is to select a base year (e.g. 2018). This will become your office reference year, against which you will measure emissions performance over time or the targeted completion date. The second step will be to select target completion data (e.g. 2025). Finally, based on your earlier discussed and agreed emission reduction percentage (e.g. 10% CO_2 reduction), our absolute target example will be; A 10% reduction in CO_2 emission below 2020 levels by 2025. In this case, 2020 is the base year, and 2025 is the target completion date. This method is found to be the most meaningful by the World Resource Institute. This is owing to the rising problems of climate change, due to the high concentrations of GHGs in the atmosphere.

B. **Intensity Target;** This GHG target is usually expressed as a reduction in the ratio of GHG emissions relative to another comparative metric.[112] For example, ADRA offices may want to express intensity targets as reducing emissions per staff member or per square meter of office space occupied. This target does not necessarily reduce the office's overall emissions, as the office with its overall operation might grow and actual emissions of CO_2 with it. As such, these targets are relevant when office space or the number of employees increased in comparison with the baseline year. If intensity targets are to be used, it is recommended that emissions also be clearly expressed in absolute terms.

[111] https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf
[112] https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

- **Step 5: Develop a GHG emission reduction strategy for your office.**

Once you have defined your office GHG reduction targets, this step touches on the opportunities and ways for office emissions reductions, towards achieving the set targets. There are two common ways in which GHG emissions reductions can be achieved i.e.; 1) Doing less of an activity that produces emissions (e.g. walking or cycling more to work and driving less), or, 2) using a technology that allows for the same level of activity to be performed but with minimal emissions (e.g. using energy-saving light bulbs over the convectional bulbs in the office). However, before an ADRA office decides on which emission reduction activities to select for their strategy, possible identified reduction activities must be evaluated from the baseline report. Additionally, opinions and recommendations of priority activities as evaluated from the baseline report can be further sourced from subject industry experts. Below are several different practices that an ADRA office may adopt and streamline in its office operations, as part of its office emissions reduction's strategies;

- **Computers:** Most computers today have power management features that enable the computer's monitor and/or hard drive to automatically power down after a specified period of inactivity. As such, ADRA staff can be encouraged to activate these power management features. Alternatively, the IT staff could activate them during their routine maintenance activities, as this would ensure that all the staff computers conform to this recommendation. Further, staff could be encouraged not to leave their computers charging when the battery is full. This is because a laptop can run successfully on its power resource, rather than eating up more energy by being on charge at the wall when not required.

- **Office lighting:** A simple way to reduce emissions is to upgrade your lighting. For example, compact fluorescent lightbulbs (CFLs) can use up to 66 percent less energy and last up to ten times longer than standard lightbulbs. Exit signs with light-emitting diode (LED), are more efficient than incandescent, and can last 40 times longer; installing motion sensors that automatically turn off when the space is unoccupied; turning lights off when offices and meeting rooms are empty ("Switch Me Off!" reminder stickers could be used); maximizing the use of natural daylight, which can reduce the energy needed for lighting as well as heating and cooling; If the organization is building new office space, encourage architects and designers to incorporate as much natural light and reflective ceiling tiles as possible into the design phase.

- **Office electronic Equipment:** When equipment like boilers and refrigeration units need to be upgraded, buying a more energy-efficient model can save considerable energy. Larger offices may be able to invest in an energy management system, that centrally monitors, operates, and programs all their lighting, heating, and air-conditioning operations. These systems can greatly reduce electricity consumption and fuel use, while also reducing operating costs.

- **Waste reduction:** ADRA may encourage 'Smart Printing" by requiring their staff to print double-sided or by setting up computers to automatically print two-sided for internal documents. Additionally, staff may be encouraged to reduce the amount of material printed by introducing an e-mail footer e.g. "Think before you print – Be Green"; Promote paperless practices such as the use of Google documents, DropBox, We Transfer, and/or Microsoft Teams, for sharing meeting minutes and project documents. Encouraging staff to use reusable coffee mugs, water bottles, or using glasses rather than single-use, disposable cups, and plastic bottles whose useful life are longer, thus delaying final disposal or recycling.

Limitation of printing: ADRA Madagascar. *All printers are removed from individual offices and 3 main printers have been installed across the office. Each staff is given an ID and password that is required for printing. The quota of pages for printing is decided based on the position of the employee.*

- **Fuel use:** Some offices use fuel in buildings' boilers or furnaces for heating, which generates GHG emissions. Replacing old units with more energy-efficient units can reduce fuel use and GHG emissions. Installing programmable thermostats which automatically adjust the temperature during specific hours, such as nighttime or weekends, is another great measure to reduce fuel use. Switching fuels may also reduce GHG emissions. For instance, old units can be replaced or upgraded to burn biofuels, such as biodiesel or ethanol, or a less carbon-intensive fuel, such as natural gas instead of fuel oil.

- **Purchasing Greenpower:** Buying green power is an increasingly common way to reduce office emissions. Green power is electricity or heat generated from renewable resources, such as; wind, solar, geothermal, biomass, landfill gas, and certified low-impact hydro. Additionally, there is the option of directly install on-site renewable energy systems, like solar photovoltaic (PV) systems, solar thermal units, and small wind power systems.

Renewable Energy for Electricity: ADRA Germany. *The office generates green power by producing twice as much electricity as it consumes.*

- **Emission Reductions from Transportation:** ADRA offices can reduce GHG emissions from transportation by using less fuel or using alternative fuels like biodiesel, using alternatives to air travel, and encouraging staff members to commute by greener means. Emissions can also be reduced by upgrading vehicles fleets to more fuel-efficient models such as electric vehicles, or gas-electric hybrid vehicles, biodiesel, or ethanol. Driver-training programs can also be offered to teach driving styles that cut both fuel use and costs.

Termination of fuel cards: ADRA Germany. *The office promotes benefits of employee's salary bonus without encouragement to use the fossil fuels, by replacing the fuel cards with a redeemable card for essential items and thereby reducing staff carbon foot print.*

- **Green Building Design:** A cost-effective way to reduce energy consumption is to incorporate green building practices into new buildings or retrofits of existing buildings. Green building designs have many features that reduce overall energy use such as; energy-efficient windows, highly efficient insulation, reflective or vegetated "green roofs", on-site renewable energy, and sites near public transportation.

- **Emissions from staff travel:** Staff travel to meetings and trainings can be reduced by using alternatives to air travel, which is the most carbon-intensive travel method. Examples would be, taking the train when feasible instead of flying, consolidating trips, organizing trips so that they are multipurpose, and increasing the use of video and Web-conferencing. To decrease emissions from staff commuting, offices can offer incentives for staff members to use public transportation, car pools, and other means of commuting, such as cycling. Using communication technology to work from home, rather than commuting, would be another option.

Work from Home Fridays: ADRA Sweden. *The office staff works from home on Fridays, hence reducing the office carbon dioxide (CO2) footprint by avoiding long distances travel by staff, in which some take up to 3 hours.*

Value chain emission opportunities. Sourcing from suppliers with relatively low GHG intensity of their manufacturing operations, or from suppliers that have built energy efficiency into their product design, can cut emissions from upstream activities. ADRA Offices may also cut upstream emission activities by coming up with a policy that advocates for obtaining materials from closer suppliers, or optimize transport routes of goods, or transport goods by less GHG-intensive modes such as rail and ships, to reduce emissions from transportation. Reducing emissions from the use or disposal of a distributed product is an example of how to cut emissions from downstream activities. Once the office reduction strategy

has been agreed upon, it is time to act on the practices. Therefore, a GHG emission reduction activities execution plan should be developed. The plan should highlight the timeframes for implementing the agreed GHG reduction measures, how the activities will be monitored and tracked, as well as roles and responsibilities of the CCC team and all staff across the organization departments, in relation to implementing these reduction measures.

In instances where ADRA practices may not suffice the emission reduction targets, the organization may consider whether offsetting its GHG emissions is a viable option. For example, one tonne of CO_2e purchased as an offset by an ADRA office, cancels out the same quantity of emissions, that would have been generated from its office activities. If an ADRA office decides to offset some of its emissions, then credits purchased from other institutions should be certified as having met the widely recognized standards, as earlier mentioned. This will protect an ADRA office from the moral and public relations risks, associated with possibly purchasing carbon credits derived from projects that contributed to poverty or environmental degradation.

Therefore, information about possible offset brokers, the carbon markets, and carbon credit providers would need to be prepared, to ensure the purchase of high-quality credits. Alternatively, an ADRA office could also purchase internally generated credits. What this means is that ADRA could capitalize on the carbon values of current or planned projects. Many ADRA projects (such as those promoting fuel-efficient stoves and sustainable agriculture/natural resource management) either involve reducing global GHG emissions or sequestering GHGs. These values can be converted into carbon credits and sold to other entities, or other ADRA offices. Important to note is that an ADRA office can only sell its carbon credits to other organizations, if they are verified with a third party, otherwise, unverified carbon credits can only be sold internally.

Purchasing internally generated credits would be a real money transaction. Therefore, money would change hands and credits would be retired. As such, an ADRA office would be sure of where these credits are coming from, i.e. reputable projects, since it has control over their implementation. The second advantage of this alternative is that an ADRA office could establish internal protocols for due diligence, which would reduce external validation costs. The net effect would be that less money would go to middlemen, and more could go directly back to community development. Lastly, this alternative presents an opportunity for the ADRA network to create an investment fund that would pool funds from its offices seeking to offset their emissions, thus financing the development of creditable multiple benefit projects for community development and climate change adaptation projects.

For any ADRA office interested to develop projects in the carbon accounting sector of Agriculture, Forestry and other Land Use (AFOLU), the office can be guided by an assessment of opportunities for pro-poor credit generation, coupled with the widely accepted Climate, Community and Biodiversity Alliance standards (CCBA) (http://www.climate-standards.org/). The CCBA set standards provides opportunities for high-quality carbon forestry and land use projects, with strong community and biodiversity benefits. CCBA identifies projects that simultaneously mitigate climate change; contribute to sustainable development in local communities; and protect natural biodiversity. This is achieved by promoting quality land-based offset projects such as; soil carbon projects, afforestation, and reforestation projects.

Plan Vivo Standard (https://www.planvivo.org/), is also another equally good and accessible certification scheme for smallholder- and community-based projects, that are focused on sustainable land use. This is because the standard is a tried and tested certification framework, for projects supporting the rural poor with natural resource management, using payments for ecosystem services. It includes requirements and processes to ensure its projects benefit livelihoods, and ecosystems, whilst providing ethical and traded climate services. The standard certifies the implementation of project activities that enhance ecosystem services and allow communities to formally recognize and quantify carbon sequestration, biodiversity, and/or watershed protection.

The Gold Standard (https://www.goldstandard.org/), is certainly of interest for potential ADRA climate change mitigation projects. The standard is a foundation established in 2003 by WWF and other international NGOs, that operates offsets standards focusing on environmental and social benefits. Some of the eligible sectors for this standard include; Renewable energy, waste management, land use and forests (afforestation, reforestation, and agriculture) and water (supply, purification, and conservation).

Given the above carbon offsetting scheme examples, it is evident that opportunities presented by offsetting activities present an effective assistance model, of using existing carbon markets to channel funds to the poorest and most vulnerable communities affected by climate change.

- **Step 6: Develop a GHG reduction initiative report.**

This is the last step that forms an integral part of the ADRA GHG emissions reduction initiative. The Greenhouse Gas Protocol defines reporting as a process that presents relevant emissions information that is complete, consistent, accurate, and transparent.

Why should you report your GHG reduction initiative?

- To raise awareness on GHG reduction amongst staff members through shared findings
- To communicate performance to stakeholders such as donors
- To demonstrate leadership and improve organization reputation
- To encourage GHG reduction changes across other ADRA network offices
- To increase understanding of your office contribution to the reduction of global GHG emissions

When and Where to report;

Once you have developed your office's inventory, calculated your emissions, set a credible emission target, and formulated a strategy to reach your goal, it is now time to share your progress. Depending on the office's emission reduction strategy and the project plan to achieve carbon neutrality, an ADRA office may choose to either provide its report at the end of for example five years, or provide annual interim updates, as part of sharing their progress before the final fifth-year report.

As you plan to share your report to interested stakeholders (e.g. public, donor communities and supporters, staff members, and other ADRA offices), you must agree on the desired option; i.e. Internal reporting options such as ADRA network, bulletins, intranet, and staff newsletters, or external reporting options such, media releases, websites or in the organization annual or sustainability reports. The forum through which you decide to share your GHG emission report with the interested stakeholders, will dictate the amount of information and the level of details you choose to report.

It is advisable that public reporting of your GHG reports into public domains such as ADRAs' website, may need an external third party to verify and certify your emissions inventory. This is done so because external third party verification is likely to significantly increase the credibility of the GHG inventory. Nonetheless, according to the GHG protocol, while verification is often undertaken by an independent or external third party, an organization may also subject their information to internal verification by personnel (s) who is/are independent of the GHG accounting and reporting process. This will most likely be the case for an ADRA office. Additionally, the high-cost implication for the certification process, also forms the basis for this option.

However, the internal verification is no different from the external verification. As a matter of fact, it should follow similar procedures and processes, as the external verification. Independent internal verifications are usually highly encouraged,

as they provide valuable assurance over the reliability of the results shared internally, and they can provide a worthwhile learning experience for the organization, before commissioning an external verification by a third party.

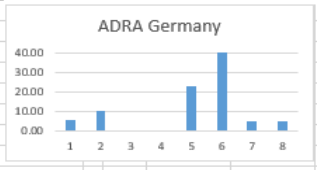
What to report;

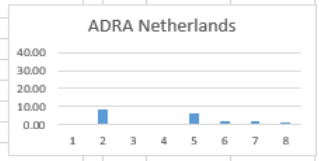
Under the framework of the GHG Protocol, the following information is required for the report:

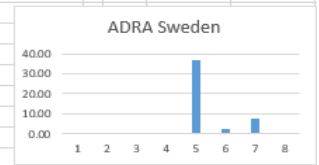
- Emissions in metric tons and in tons of CO_2e.
- Separate emissions from each scope plus the total emissions from each scope, showing the sum of your office's emissions.
- The chosen base year and your office's emission performance over time compared with that of your base year and reduction target.
- Methodologies used to calculate emissions, including emission factors and their sources or a reference to the calculation tools used, with the same information.
- Appropriate context for any significant emission changes such as, changes in reporting boundaries, and base-year recalculations.

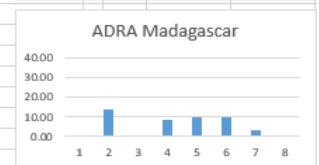
Information about the GHG offsets and purchases should be included in your GHG report. Below is an example of a GHG emission 2018 baseline report (Carbon Neutral Strategy Pilot), with summarized emissions from 4 ADRA offices. The data is summarized for the categories of emissions (Tables 1-8), the three scopes (colour coded in a light green(scope1), light blue (scope2), and light orange (scope3), and the office totals. From the report, it is evident that the most important emissions across the 4 offices are the direct emissions from owned or controlled sources (scope 1) and the indirect emissions from purchased energy (scope 2).

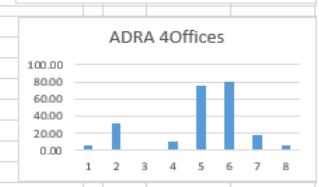
Office_ID	Table	Description	GHG-Emissions (tCO2e)	Scope (1 3) (tCO2e)	Total (tCO2e)
ADRA Germany	1	Emissions from Stationary Sources	5.61	15.71	114.24
	2	Emissions from Passenger Vehicles	10.11		
	3	HFC and PFC Emissions from Refrigeration / Air-conditioning Equipment	0.00		
	4	Emissions from Purchased Electricity, Steam, Heating and Cooling	0.00	0.00	
	5	Business Travel - Air	22.75	98.52	
	6	Business Travel - Land and Sea	66.33		
	7	Business Travel - Hotel stay	4.90		
	8	Waste Disposal - Mixed Paper and Board	4.54		
ADRA Netherlands	1	Emissions from Stationary Sources	0.00	8.61	20.23
	2	Emissions from Passenger Vehicles	8.61		
	3	HFC and PFC Emissions from Refrigeration / Air-conditioning Equipment	0.00		
	4	Emissions from Purchased Electricity, Steam, Heating and Cooling	0.63	0.63	
	5	Business Travel - Air	6.39	10.99	
	6	Business Travel - Land and Sea	1.77		
	7	Business Travel - Hotel stay	1.78		
	8	Waste Disposal - Mixed Paper and Board	1.04		
ADRA Sweden	1	Emissions from Stationary Sources	0.00	0.00	47.42
	2	Emissions from Passenger Vehicles	0.00		
	3	HFC and PFC Emissions from Refrigeration / Air-conditioning Equipment	0.00		
	4	Emissions from Purchased Electricity, Steam, Heating and Cooling	0.39	0.39	
	5	Business Travel - Air	36.88	47.03	
	6	Business Travel - Land and Sea	2.51		
	7	Business Travel - Hotel stay	7.63		
	8	Waste Disposal - Mixed Paper and Board	0.01		
ADRA Madagascar	1	Emissions from Stationary Sources	0.23	13.63	44.79
	2	Emissions from Passenger Vehicles	13.40		
	3	HFC and PFC Emissions from Refrigeration / Air-conditioning Equipment	0.00		
	4	Emissions from Purchased Electricity, Steam, Heating and Cooling	8.57	8.57	
	5	Business Travel - Air	10.05	22.59	
	6	Business Travel - Land and Sea	9.57		
	7	Business Travel - Hotel stay	2.98		
	8	Waste Disposal - Mixed Paper and Board	0.00		
ADRA Total	1	Emissions from Stationary Sources	5.83	37.95	226.68
	2	Emissions from Passenger Vehicles	32.12		
	3	HFC and PFC Emissions from Refrigeration / Air-conditioning Equipment	0.00		
	4	Emissions from Purchased Electricity, Steam, Heating and Cooling	9.59	9.59	
	5	Business Travel - Air	76.07	179.14	
	6	Business Travel - Land and Sea	80.18		
	7	Business Travel - Hotel stay	17.29		
	8	Waste Disposal - Mixed Paper and Board	5.59		











6. Reducing GHG Emissions in ADRA Projects.

There is only one atmosphere, and it has no borders for CO_2 emissions. Therefore, any ADRA project regardless of its location of operation is responsible not only to save lives and alleviate human suffering but to also promote environmental sustainability in addressing the global climate breakdown. The European Union-United Nations Development Programme (UNDP) Low Emission Capacity Building Programme, defines low-emissions development strategies as one that is characterized by, "low-carbon" approaches to "achieve sustainable development, based on the national socio-economic and development priorities." From this definition, below are some of the issues that an ADRA development and humanitarian projects can consider while coming up with a new project design, aimed at reducing/mitigating GHG emissions from its operations;

- Identify all possible sources of carbon emission during the life of the project: Examples of emission sources for development programs would include; transportation of materials (i.e. vegetable seeds, construction materials, beehives), farm inputs such as chemical fertilizers and pesticides, fossil fuel-powered water pumps and irrigation systems, while those for humanitarian response would be items such as; food, water, shelter, beddings, etc.
- Identify all possible mitigating/reduction activities for the above-identified sources of GHG emissions. Examples for development programs include; solar-powered irrigation systems, fuel-efficient field vehicles, and motorcycles, organic fertilizers, conservation agriculture, sourcing for inputs such as tree seedlings as well as construction materials locally, etc. while those for humanitarian response would be; fuel-efficient fleet vehicles, waste recycling options, green procurement strategies in place, cash transfer modalities, etc.
- Identify possible carbon offsetting activities such as reforestation, soil improvement, agroforestry, energy-efficient cookstoves, etc.) to include in both development project design, as well as humanitarian response project with a recovery phase.
- Ensure carbon offsetting and mitigation measures are well captured by the project budget. i.e. they have a budget line to support their effective implementation.
- Look out for possibilities of carbon credit purchase from the available project budget.
- Identify possible opportunities for climate change awareness training for staff such as those in the health projects or learners/teachers for education projects, as well as community training programs for the transition to a low-carbon society/community in livelihood projects.
- Ensure tools that promote sustainable development such as Environmental Impact Assessment (EIA) are part of requirements for development project activities such as those that entail construction activities i.e. classrooms, health clinics, or disturbance of the natural environment such as big irrigation projects, and that there is a budget line to support the activity.
- Educational and professional qualifications of staff and their experience with the matter relating to GHG and/or climate change-related issues. For example, while an ADRA office may plan to buy a vehicle(s) for a given project, one may wish to check that the driver(s) to be hired have been trained in eco-driving to reduce fuel consumption and emissions or not, to consider it for either an internal/or external training. This could also be the case for the field staff, given that their understanding of GHG emissions/mitigation issues will go a long way in assisting the project to achieve a net zero project activities.
- Ensure the project GHG measurements forms part of the core project monitoring, evaluation, and reporting activities, to ensure that part of the projects annual reporting entails the project GHG balance, as described in the steps below, using a livelihood project example;

Step1: Examine the project operations.

All the necessary project operations that will result in GHG emissions such as transportation of the project staff/volunteers as well as project items/deliverables (i.e. tree seedlings, beehives, clean stoves) should be considered while coming up with a project action plan, necessary for the GHG assessment and calculations. Using a hypothetical example of a reforestation/ agroforestry climate adaptation project for an ADRA X Country office, illustrated below are the key major processes, that could take place in this livelihood project.

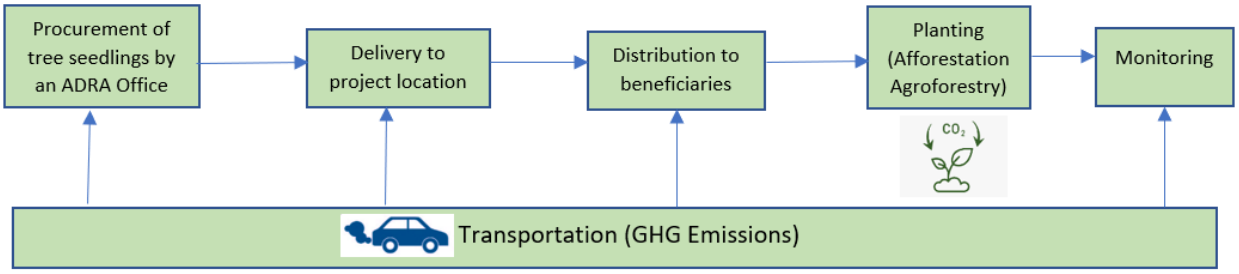


Figure 29 Main process for the lifecycle assessment in an afforestation project operation

From the diagram, it is evident that transport is the main source of GHG emission for this project activities, and so would be the case for many ADRA livelihood development programs. To bring the point closer home, the information on the figure above, can best be found or located in most ADRA's projects detailed implementation plan (DIP), as shown in the figure below. From this DIP plan, one can now easily see and evaluate the proposed project activities, and their potentials for GHG emissions (i.e. whether they will result in GHG emissions, or mitigate GHG emissions).

	Activity	Indicators	Target	Achieved	Overall Target	Officer Resp.	2018 Q1			2018 Q2		
4.0	**Environmental Conservation**											
4.1	Mapping of sites	No of sites	6	6	6	PM/TEAM						
4.2	Targetting of beneficiaries	No of beneficiaries	3000 HH	3000 HH	3000HH	PM/TEAM						
4.3	Verification of beneficiaries	No of beneficiaries	3000 HH	3000 HH	3000HH	PM/TEAM						
4.6	Procurement of tree seedlings for enrichment planting	No of seedlings	30000	18335	30000	PM/TEAM						
4.7	Distribution of tree seedlings	No of seedlings	30000	18335	30000	PM/TEAM						
4.8	Monitoring of the planted trees	No of monitoring activities	3 per quater	6	30	PM/TEAM						

Figure 30 DIP Example of an afforestation project

Step 2: Calculating the identified GHG emission project activities.

Now that we have come up with a reference point of anticipated sources of GHG emission sources for the project activities, the next step is to apply the ADRA carbon calculation tool in the calculation. This will follow the initial calculation steps highlighted in the document, with the key area of focus being Table 2 of the tool, which seek to calculate emissions from vehicles/motorcycles owned by ADRA (see below screenshot)

TABLE 2: GHG Emissions from Passenger Vehicles (owned or controlled cars/motorbikes or fuel provided for transport)						
Office_ID	Activity / Option	Type of Vehicle	Fuel Type	Milage	Emissions Factor (kgCO2e)	GHG-Emissions (tCO2e)
Milage in Kilometers						
ADRA Netherlands	Car_segment	Dual purpose 4X4	Diesel	26,528.00	0.21194	5.62

Figure 31 Example of GHG emissions calculation

Step 3: Calculating GHG emission reductions from the identified project activities.

Now that we have GHG emissions from our project administrative activities calculated, the next step is to calculate the amount of emissions reduced by the project. In our case example, GHG reduction in the atmosphere will be through sequestration by the trees planted. To produce acceptable estimates of sequestration by this ADRA X project, we are going to use a set of simple, user-friendly, web-based calculation tools (AFOLU Carbon Calculator - ACC) http://afolucarbon.org/. The tool that is developed by the USAID, is widely used in estimating the GHG emission impacts of its worldwide land use-based portfolio of project activities.

The AFOLU Calculator employs IPCC-based accounting methods, that allow users to estimate the CO_2 benefits and potential climate impacts of eight different types of land-based project activities: forest protection, forest management, afforestation/reforestation, agroforestry, cropland management, grazing land management, forest degradation by fuelwood, and support/development of policies, as illustrated in the figure below; Each of these tools within the AFOLU Calculator transparently documents the methods, discusses the assumptions, and presents the underlying data along with its associated sources of uncertainties.

Activity Types Covered in ACC	Examples	Tool
Forest conservation	- Creating new protected areas - Strengthening existing protected areas - Reducing community timber harvesting inside protected areas - Managing forest fires - Preventing/Reducing illegal logging activities - Protecting mangrove wetlands	Forest Protection
Managing productive forests	- Promoting reduced impact logging (RIL) and reducing the volume of timber harvested. - Stopping logging in uneven-aged forests	Forest Management
Planting forests	- Reforesting degraded lands - Forest plantation (natives or exotics) - Reforesting mangrove wetlands - Implementing agroforestry systems	Afforestation/Reforestation Agroforestry
Managing agricultural lands	- Diversifying agricultural and forestry yields through agroforestry - Improving livelihoods through agroforestry - Reducing or eliminating tillage - Altering fertilizer input (type and amount) Modifying the flood regime of rice paddies	Agroforestry Cropland Management
Managing grazing lands	- Improve management of grasslands - Reducing the number of livestock per area - Altering the type of livestock managed - Rewetting organic soils	Grazing Land Management
Mitigating forest degradation	- Improved cookstove programs to reduce fuelwood demand	Forest Degradation by Fuelwood

Figure 32 Example of project activities covered by ACC tools [113]

The first step to using the tool is to register an account, that will create a unique profile, allowing you to save and store your work as well as generate a report. More information on how to use the tool can be found here; http://afolucarbon.org/additional-support/. Additionally, based on the livelihood project activity on implementation, below is a list of short tutorial's videos, that one can watch regarding the use of a selected ACC tool of choice;

1. Afforestation and Reforestation Tool: https://youtu.be/JVMqctHbbjc
2. Agroforestry Tool: https://youtu.be/HqcGoNTGYfQ

[113] http://afolucarbon.org/static/documents/AFOLU-C-Calculator-Series-UserManual.pdf

3. Cropland Management Tool: https://youtu.be/jHb680l99yk
4. Forest Degradation by Fuelwood Tool: https://youtu.be/ClnT53VYq7w
5. Forest Protection Tool: https://youtu.be/aZX-5XdZTlU
6. Grazing Management Tool: https://youtu.be/Y2nxp8B3I1o
7. Forest Management Tool: https://youtu.be/McRpy5-gFvY

Assuming that in our hypothetical example, targeting 3,000 beneficiaries with 3,000 tree seedlings was to cover an approximate 3 Ha (if the tree seedlings were to be established in a single land parcel), using the Afforestation and Reforestation Tool, below is a screenshot of the calculation benefit (tCO_2) report, that the project would have sequestered in the first-year implementation.

Project Summary

Afforestation of community degraded agricultural lands

Table 1: Summary of project activities

Name	Location		Type	Area	Benefit t CO_2
Rehabilitation of Agricultural lands	Kenya	Eastern	Agroforestry	3	**20**
			Total	**3**	**20**

Figure 33 Afforestation project summary report

The tool can give up to 30 years of estimated (tCO_2) benefits for the project, assuming the effectiveness of the survived trees remains constant. For this reason, depending on the project duration, one may opt to consider the first year of the project as the baseline for the activity. This information can then be used to compare with the consequent years of annual reporting, which in this case, will be pegged on the effectiveness (survival rates of trees planted) as recorded during monitoring activities.

Step 4: Calculating GHG Balance for the Project.

Now that we have gotten the GHG emission resulting from the project (5.62 (tCO_2e)), and carbon sequestration of **20 (tCO_2eq),** we are now going to calculate the GHG balance for the projects. This is simply achieved by subtracting the project activities producing emissions, from project activities that reduce emissions i.e.

Project GHG Balance = 5.62 (tCO_2e). – 20 20 (tCO_2eq). = ***-14.38 (tCO_2eq)/yr.***

From the project GHG balance calculation, it is therefore evident that tree planting activities by the hypothetical project example, is a great neutralizer of GHG emissions, accounting for a negative emission of -14.38 (tCO_2eq)/yr. for the ADRA X country office.

Now that we are aware of some of the key issues to look out while designing project aimed at reducing GHG emissions for ADRA projects and how to calculate the project GHG balance, the table below highlights some of the actions to consider in reducing GHG emissions, in all the 3 key thematic areas of ADRA operations.

Areas of Focus	**Actions to consider to reduce GHG emissions**

Health	▪ Promote the development and adoption of Green procurement and supply chain policies that promote sustainable packing, reuse, and recycle of packaging materials and eco-label ratings (Energy Star) for health products hence reducing GHG emission resulting from the procurement process. ▪ Promote the use of renewable energy sources for powering hospital equipments'. e.g. Cold chain solar refrigeration on systems for immunization campaigns. Additionally, alternative clean and renewable energy sources (e.g. solar and wind energy and some biofuels), can be used for lighting, heat generation, pumping, and heating water hence reducing emissions resulting in the use of electricity as well as fossil fuels in generators to provide power. ▪ Promote practices that reduce the volume of wastes generated by ensuring proposer waste segregation i.e. Making sure infectious and hazardous health care wastes are properly segregated from general waste to reduce waste disposals and increase recycling materials. A small portion of medical waste that has a high proportion of infectious plastic waste can be landfilled after disinfection, rather than incinerated, given that burning plastic produces high quantities of greenhouse gases in addition to toxic air pollutants such as dioxins and furans.[114] ▪ Promote access to information and comprehensive training programmes for staff involved in health projects so that they develop and hone the necessary skills to deliver GHG emissions reductions practices such as reducing energy through turning off medical equipment's when not in use, using natural light during daylight hours, and use of public means while commuting to work. ▪ Promote food-based dietary guidelines, which provide brief messages to promote nutritious diets that are both nutritious and sustainable i.e. encouraging sustainable home gardening for production of household nutritional needs. ▪ Promote the incorporation of green building principles in the design and construction of health care facilities e.g. siting the facilities near public transportation routes, using local building materials, planting trees on the site, and incorporating design components like daylighting and natural ventilation. ▪ Subjecting health care facilities development projects to Environmental Impact Assessments (EIA). EIA is a tool for identifying potential environmental impacts (including a range of data relevant to GHG emissions.) of a proposed project or development before decision-making. The tool aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment, and present the predictions and options to decision-makers. By using EIA both economic, social, and environmental benefits such as reducing GHG emissions resulting from health care facilities/clinics can be achieved.
Education	▪ Promote sustainable learning supplies e.g. eco-friendly school bags/bag packs, as well as their transportation e.g. by use of recyclable aluminum boxes that can facilitate safe storage and easy transportation in both normal and humanitarian conditions, hence

[114] https://www.who.int/docs/default-source/climate-change/healthy-hospitals-healthy-planet-healthy-people.pdf?sfvrsn=8b337cee_1

	reducing harmful waste from both the supplies and related transportation, thereby lowering carbon emissions. ▪ Promote School-based reforestation initiatives, that improve carbon sequestration through engaging students and teachers in tree planting activities, with emphasis on multi-purpose trees and species such as fruit trees for nutrition in schools. ▪ Promote GHG emission reduction programmes to students/pupils and school staff through encouraging and rewarding ideas and activities which will reduce energy use. Teachers can bring energy information into lesson plans, most obviously within science or mathematics lessons. ▪ Support and encourage adoption of energy-saving behaviors e.g. switching off lights and electrical equipment when not in use. Can be achieved by encouraging schools to have groups of 'eco champions, who check at the end of each day for equipment or lights that have been left on, and switching them off. ▪ Promote girl's education. According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO) data used, educating girls could result in a massive reduction in emissions of 51.48 gigatons by 2050.[115] Girl's education is one of the most powerful levers for avoiding emissions by curbing population growth. Women with more years of education have fewer and healthier children, and actively manage their reproductive health. ▪ Promote local food production for school food requirements through support in the establishment of climate-friendly and sustainable school kitchen gardens, thereby reducing emissions related to transporting vegetables across vast distances (known as 'food miles') and associated storage materials and temperatures that require a lot of energy. ▪ Promote low-cost clean sources of lighting energy such as solar lamps, for children in rural/refugee camps whose households are seldom connected to an electrical grid, thereby helping to reduce global emissions resulting from use of kerosene lamps. ▪ Promote the incorporation of green building principles in design and construction of class rooms among other school facilities e.g. by using local building materials, planting trees on the site, and incorporating design components like day lighting and natural ventilation. ▪ Subjecting all education facility development (e.g. classrooms, administration blocks) to Environmental Impact Assessments (EIA).
Livelihoods	▪ Promote the integration of simple environmental conservation actions such as reforestation, soil, and water conservation (i.e. terraces, half-moons, etc.) that would result in healthy farm soils and increased vegetation land cover necessary for carbon sequestration, in projects where the modality is through Food or Cash for work programming. ▪ Promote agroforestry and regenerative agriculture practices that combine productivity and biodiversity restoration (e.g. conservation agriculture - intercropping, mulching, no-tillage, and manure/livestock waste management) that transform farms into carbon sinks,

[115] https://www.resilience.org/stories/2020-02-24/educating-girls-is-more-effective-in-the-climate-emergency-than-many-green-technologies/

	by reducing GHG emissions resulting from deforestation and land degradation resulting from convectional farming activities. ▪ Promote low emission irrigation development livelihood projects such as using solar-powered irrigation systems (SPIS), that provide clean technology options for irrigation activities. SPIS allows the of use solar energy for water pumping and replacing fossil fuels as an energy source, thereby reducing greenhouse gas (GHG) emissions from irrigated agriculture, whilst improving crop yields from changing rainfall patterns and reduced water availability. ▪ Promote the use of cash transfers, that enable poor households to access food and other basic livelihood items locally, thereby reducing emissions that would have otherwise resulted in the logistics of the acquired food and other livelihood items such as planting materials to and within the project area. ▪ Promote Nature-Based Solutions, (ecosystem-based approaches[116]) such as; - Reforestation and restoration of key natural ecosystems, e.g. mangroves, which are powerful carbon sequestration agents and livelihood options for coastal communities. - Agroforestry, reforestation, and afforestation programmes, particularly in Arid and Semi-Arid Regions, to reduce land degradation while soaking up carbon. - Protection/restoration of wetlands such as the peatlands, which are known to store twice as much carbon as forests. - Switching to restorative agricultural practices, such as cover crop rotation that support healthy soils. - Upsloping vegetation to reduce the risks of landslides; and creating permeable green water scarcity areas to help replenish groundwater in regions facing. - Reseeding degraded rangelands using native grasses, given that grasses store more of their carbon underground, leading to fewer carbon losses from fire or drought. ▪ Promote nature-based income solutions such as beekeeping, as part of sustainable livelihoods diversification options in tackling poverty and biodiversity conservation. Unlike unsustainable and negative livelihood options such as charcoal burning for household income generation, these nature-based income solutions ought to reduce Green House Gases through increased biodiversity and land vegetation that sequester carbon. ▪ Promote energy-efficient cooking solutions (e.g. fuel-efficient cookstoves) that would help to decreases wood fuel consumption, hence preserving forests among other vegetation land covers that sequester carbon. Additionally, this can also be achieved through promoting fuel-efficient cooking techniques training, and sensitization activities that would reduce the time taken to cook (e.g. pre-soaking to soften cereals such as beans hence making them cook fast, using tight-fitting lids to retain the heat inside the pot, sheltering cooking fires).[117]

[116] https://www.ecologic.eu/sites/default/files/publication/2014/eco_bfn_nature-based-solutions_sept2014_en.pdf
[117]https://www.wfp.org/publications/wfp-handbook-safe-access-firewood-and-alternative-energy-safe

	▪ Promote other types of renewable energy, that can positively impact livelihoods, such as solar freezers, wind and hydro energy to power electronic devices, natural refrigeration methods. ▪ Integrate circular economy concepts into livelihoods activities through creating sustainable waste management and waste recycling and repurposing. ▪ Promote the enhancement of carbon sinks and reservoirs of GHG emissions in Arid and Semi-Arid (ASAL) regions, through sustainable and cost-effective land restoration approaches such as Farmer Managed Natural Regeneration (FMNR) as well as rangeland rehabilitation through indigenous rangeland fodder grasses (e.g. Eragrostis superba, Enteropogon macrostachyus). ▪ Promote policy and community by-laws developments regarding sustainable wood fuel systems and tree management. ▪ Subjecting livelihood developments infrastructures e.g. Sandam's, boreholes, and irrigations systems to Environmental Impact Assessments (EIA).
Emergency	▪ Pre-packed kits for emergencies response. i.e. assembling products that complement each other to provide a comprehensive supply response. e.g. Non-Food Items (NFIs) such as bedding materials, soaps, and sanitary towels put in a single bucket, thereby reducing emissions that would have resulted in packaging material requirements and transportation. ▪ Decreasing the volume of goods transported without compromising on the needs of those affected. For example, drinking water scarcity can be dealt with by providing water purification tablets/purified water trucking instead of bottled water. As such, the volume of goods (water bottles) and waste is reduced, supply quantity increased therefore meeting the needs of more end-users (beneficiaries) whilst at the same time reducing GHG emissions emanating from life stages of water bottle manufacturing. ▪ Reducing distance covered by relief goods from the point of loading till consumption through sourcing locally and positioning of stock near-by affected areas/ repeatedly hit areas of natural disasters. Both factors would greatly reduce GHG emissions resulting from long distances in transportation. ▪ Ensuring that vehicles, which mostly consist of trucks, used for humanitarian goods transportation are in healthy condition with minimum carbon emissions. This could be achieved by coming up with criteria for transport hiring during disaster response and in long-term resilience and development projects, as well as policies such as eco-driving, trucking devise, and surprise check-up of the trucks during the humanitarian operations. The selection of eco-friendlier mode of transportation would not only serve the purpose of selecting trucks that will minimize carbon emissions but the efficiencies in emergency response. ▪ Promote energy-efficient cooking solutions as well as solar solutions for lighting in emergency response. In disaster-hit areas, energy becomes a rare commodity for both the affected communities and to some extent the humanitarian actors. The unavailability of this service in most instances increases GHG emissions from unsustainable lighting and cooking sources. As such, clean and renewable energy and effective energy strategies should be incorporated into ADRA humanitarian response, with an aim to meet the energy needs through renewable sources during emergency response.

- Adoption of green procurement policies. Green purchasing can allow an organization to offset financial and environmental risk, rather than inheriting it from their suppliers. Examples here could include:
  - Acquisition of certain international certifications (e.g. ISO/EMAS) as a prerequisite for being able to participate in ADRA tender
  - Purchasing of more energy-efficient goods (e.g. energy-efficient stand-by power devices; Alternative fuel vehicles/alternative fuels; Bio-based products, Non-ozone depleting substances) and the application of strict energy efficiency standards for construction in development work.
  - Evaluating products based on the full range of life-cycle factors, including durability, reusability, recycled content, hazardous material content, energy efficiency, packaging, and energy (in terms of transportation) required to transport/ship the product.

Below is an example of a Green Procurement Process:

Pre-purchasing	• Plan market research for sustainable alternatives, • Assess the sustainability risks of services and products, • Arrange supplier conferences to discuss sustainability issues, options, and ideas, • Rethink / define requirements and what technical, functional, and performance standard options are necessary, • Source and assess supplier social and environmental policies and impacts.
Purchasing	• Where applicable and/or relevant in solicitations, include sustainability aspects, criteria, points in solicitation notices and documents, • Evaluations could reflect a life-cycle cost approach, and weighted scoring, which could reflect sustainability points, • Transport and logistics should consider minimizing environmental impact, • And optimize packaging.
Post purchasing	• Contract management may include monitoring sustainability key performance indicators, and the assessment of environmental and social performance, • Product evaluation should confirm if the 'green' product is working as well as the less environmentally friendly product.

Source: UNICEF Supply Division

7. Climate proofing of ADRA projects

There is now clear scientific evidence that global warming and climate change is real. IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, confirms that climate change is already affecting people, ecosystems, and livelihoods all around the world.[118] Warmer temperatures, sea-level rise and extreme weather are anticipated to damage property and critical infrastructure, impact human health and productivity, and negatively affect sectors such as agriculture, forestry, fisheries, and tourism. According to the Human Development Report (2019), Climate change will hurt human development in many ways beyond crop failures and natural disasters, yet these impacts will not be distributed or felt uniformly, as those 'with the least resources have the least capacity to adapt and are the most vulnerable.[119]

The European Union Climate Policy Info Hub defines Climate proofing as, a term that refers to a process of mainstreaming climate change into mitigation and/or adaptation strategies and programmes. The term is often used in the development context. Here, climate proofing specifically refers to a process of mainstreaming climate change into development strategies and programmes, i.e. development is viewed through a climate change lens.[120]

Climate proofing helps ensure that development projects implemented under current climate conditions are designed properly, to remain efficient in the future, when the climate may be slightly different. For instance, when investing in the planting of an orchard, it is important to make sure that selected species will be able to grow and maintain enough productivity under changing climatic conditions. Integration of climate change factors into development projects helps to avoid, if possible, or reducing future costs related to adaptation of projects to climate change impacts. This is best visualized by the climate change screening and adaptation scenarios by the UNDP Climate Change Proofing guide,[121] which highlights the different possible outcomes of the climate proofing process;

- **The 'worst-case scenario' is the 'climate ignorant' scenario (future 3);** where no adaptation is made to climate changes. This is for example when a prescriptive approach is followed year by year to crop selection, flood dike construction, and building standards that just keep on failing with climate changes.
- **In the 'climate adjusted' scenario (future 2):** There is a passive adjustment based on the failures ('learning by failure') that are experienced. For example, a change in crops after successive failures, abandoning of increasingly marginal croplands, or changes in health care responding to problems as they emerge. The responses are to impacts rather than causes, and the response does not consider the causes.
- **In the 'climate proofed' scenario (future 1):** Potential climate change risks are addressed before the emergence of the impacts. This can be based on improved knowledge, early warning systems, and planning taking the potential impacts of climate change into account. The response also concerns the causes in addition to the impacts.

[118] https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf
[119]http://hdr.undp.org/sites/default/files/hdr2019.pdf
[120] https://climatepolicyinfohub.eu/glossary/climate-proofing#:~:text=Climate%20proofing%20is%20a%20term,used%20in%20the%20development%20context.
[121] https://www.uncclearn.org/wp-content/uploads/library/unssc04.pdf

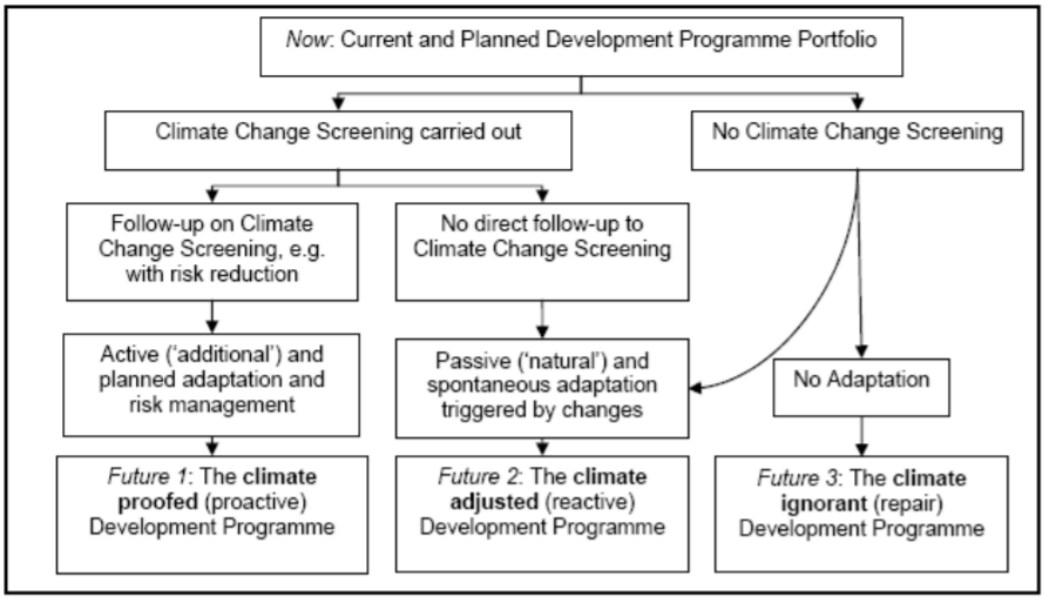


Figure 34 Climate change screening and adaptation scenarios.

Additionally, it is worth noting that climate proofing also ensures that a programme/project results will not lead to maladaptation. Maladaptation may occur where there is no obvious need for adaptation under current circumstances, but where existing development policies and practices yield short-term benefits while increasing longer-term risks [122](e.g. short-term adaptation strategies in response to a decrease in rainfall could include over-exploitation of groundwater resources, which could exacerbate vulnerability over the longer term).

It is important to note that no programme/project will ever be truly 'climate-proof'. The best we can do is to understand the range of risks that people, project activities and results (in terms of assets or services) may be exposed to and make our best efforts to monitor and reduce those risks. Ideally, climate proofing takes place during the initial drafting and planning of measures or during the re-orientation and updating of the planning phase. As such, it consists of the important working steps, which are carried out during these planning processes, as described below[123].

1. **Risk Screening.** Climate risk screening is carried out during the project concept phase by project teams. Its goal is to alert project teams in the early phase of the project cycle, of the potential exposure and vulnerability of the project to climate change. An additional goal of climate risk screening is to facilitate and initiate early on the process of co-financing of the climate-proofing measures if such measures may be warranted. An example of key questions that can be used during the screening process has been discussed in part 4 of the document, and specifically, the list of questions can be found in section 4.4.

2. **Risk assessment:** Projects identified to be at medium or high risk undergo a further and more detailed screening, i.e. Risk assessment. While still a screening mechanism, this step aims to detail further the specific nature of the climate risks and associated impacts. As such, information on the impacts of climate change, affected groups of the population, their vulnerability factors, and potential damage and losses are compiled and evaluated, through a list of questions as illustrated in the table below.

[122] https://www.uncclearn.org/wp-content/uploads/library/unssc04.pdf
[123]https://www.dkkv.org/fileadmin/user_upload/Veroeffentlichungen/Publikationen/DKKV_Climate_proofing_of_programmes_and_projects_of_Welthungerhilfe.pdf

Risk assessment			
Effects of climate change	**Affected population groups and assets**	**Most important sensitivity factors and strengths**	**Risk (description and evaluation)**
Has climate change already had effects on the project region? Are effects expected during the next few decades? If yes, then what effects? Do these represent threats or opportunities?	Are important population groups and assets in the project area affected by the negative effects? Could the target group benefit from the positive effects? If yes, who and how?	Why will the affected population group, respectively asset, probably suffer damage or losses due to the effects of climate change, respectively why won't they benefit from positive effects? Which of their strengths and resources can help in reducing risks, respectively adaptation to climate change?	What negative impact (damage and losses) will the population group or asset probably suffer due to the effect of climate change? Is the risk rated as „high, „medium" or low"? Which identified risks are particularly relevant for the success and the sustainability of the project? Are there potential positive impacts (opportunities) to benefiting from the positive effects relevant to the target group and/or success of the project?

Figure 35 Key issues in risk assessment

3. **Options for action (adaptation measures and strategy):** Once the key issues in the programme/project risk assessment have been listed, the next step is to identify and discuss the possibilities of reducing each risk (adaptation). This can be achieved through a summary of questions as illustrated in the table below; An example of such adaptations for shelter constructions can be found here: A Practical Guide to Climate-resilient Buildings & Communities https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/36405/Adapbuild.pdf

Risk assessment (Step 1)				
Effects of climate change	**Affected population groups and assets**	**Most important vulnerability factors and capacities**	**Risk (Description and evaluation)**	**Options for action for the adaptation (also any possible contributions to mitigation)**
				What measures are suitable for reducing the climate risks rated as most important? What measures are suitable for benefiting from relevant opportunities arising from the climate change? Can measures which contribute towards mitigation be appropriately integrated into the project?

Figure 36 Identifying options for action based on risk assessment

4. **Prioritization:** Lastly, the options for action are then carefully considered based on agreed and coordinated criteria, and rating options (e.g. low, medium, high). The table below illustrates the criteria by which the programme/project options for adaptation actions should be evaluated for prioritization.

	Criteria 1	Criteria 2	Criteria 3	Criteria 4	
Measure	**Effectiveness**	**Cost**	**Feasibility**	**Sustainability**	**Rating**
	Does the option reduce vulnerability and help reinforce resilience? Is the option flexible? i.e. Can it be adjusted in response to changing conditions?	Is this option more expensive or cheaper than the others? Are the long-term costs high or low? maintenance administration, staffing etc. Can the planned programme/ project activities cover the costs?	Are there necessary human, legal, technical, financial material, and administrative resources? Are there enough skills, knowledge, and capacities to take this option? Is there a need to adjust other policies to accommodate the adaptation and mitigation option?	Is this option socially, economically, and environmentally sustainable? Is the option sustainable in the long term without external financial and technical support?	

Figure 37 Prioritization of options for actions based on selected criteria

Additionally, once the above 3 steps are completed, an ADRA office needs to ensure that the adaptation measures proposed are implemented efficiently. To ensure that identified adaptation measures are effective and efficient, it is recommended that indicators to be included in the project's Resource and Results Framework to monitor the implementation of the measures are developed. As such, a progress monitoring & evaluation plan is necessary for tracking progress, whilst ensuring accountability and collection of lessons learned, to continuously improve and replicate good practices across the ADRA network.

A more detailed technical guidance on climate proofing of infrastructure projects can be found here; https://ec.europa.eu/clima/sites/default/files/adaptation/what/docs/climate_proofing_guidance_en.pdf. From the above steps, and those highlighted by the technical guidance on the climate proofing of infrastructure in the period 2021-2027 (above link), below are some examples of climate proofing adaptation and mitigation options, that an ADRA office may consider in the key thematic areas of Livelihoods, Health and Education of operations;

7.1 Livelihoods:

- Promote drought-tolerant crops (e.g. sorghum, millets, pigeon pea, cowpea) in reducing risks of crop failure in areas where climate projections indicate a decrease in rainfall patterns and/or increase in drought events. However, it is important to note the risk of preserving biodiversity as part of long-term resilience should be considered. The danger is the high probability of adapted monocultures, which will be planted instead of a variety of crops and in the long run, damaging the ecosystem. Nevertheless, while drought-tolerant crops are encouraged as part of climate resilience, mixing crop varieties, plan to complement plants together, having grass vegetation strips and trees between plantations, as well as practices that allow the soil to rest and bind more Carbon (increasing soil carbon content) should be highly encouraged. Additionally, it is important to note that genetically modified varieties of monocrops on

a large-scale area under heavy chemical fertilizers do not contribute to ecosystem resilience, but rather, contribute negatively to the community resilience.

- Promote irrigation infrastructure design standards that encourage effective drainage systems, open channels, or distribution systems that reflect changes in future expected runoff resulting from high precipitation, that would lead to flooding incidents.
- Climate-proof energy infrastructure by promoting renewable energy development such as clean cooking solutions (cook-stoves, briquettes, etc.), in areas where demand for wood fuel is forecasted to decrease owing to climate change impacts such as drought and famine among other associated resilience benefits such as the need for saving natural forests.
- In the case of coastal irrigation systems, promote protective structures/barriers such as mangrove rehabilitation to decrease salinity intrusion from rising sea levels or storm surge.
- Promote establishment, conservation and bulking of drought-resistant rangeland forage species (e.g. Cenchrus ciliaris, Eragrostis superba) in pastoral/ agropastoral livelihood communities, where climate projections indicate a decrease in rainfall patterns with an increase in recurring drought events.
- Promote drought-tolerant tree seedlings, (e.g. Moringa oleifera, Azadirachta indica) in reducing the risk of afforestation program /project failures, in areas where climate projections indicate an increase in temperature with a decrease in rainfall patterns and/or increase in drought events.
- Where climate projections indicate an increase in water scarcity and reduced water availability, promote the use of high-efficiency micro-irrigation (including drip and trickle irrigation systems) that aims to meet daily water needs efficiently by allowing water to drip slowly to the roots of plants without completely saturating the root zone whilst maximizing on the yields.
- Promote salt-tolerant crops and varieties (e.g. Kales, Spinach), in reducing the risk of crop failure in areas where climate projections indicate increasing/prevalence of soil salinity, which is in most instant exacerbated by limited rainfall, high temperatures, and overuse of groundwater resources.
- Promote the development of low-cost climate-smart rainwater harvesting and conservation technologies such as Sand dams, towards supporting irrigation and livestock production in areas where climate projections indicate an increase in temperatures, decreased precipitation, and an increase in intensity and frequency of extreme events such as droughts and/or heavy rainfall.
- Promote practices that encourage soil and water conservation on rainfed cultivated lands. Such practices will include the use of protective ground cover while cultivating annual crops through techniques such as zero/minimum tillage and mulching systems to ensure fields are less susceptible to erosion. Additionally, this may also include the establishment of live contour barriers, as they tend to have a co-benefit of farm water conservation, and providing livestock feed or supplement foods depending on the vegetation plant in the trenches.

7.2 Health:

- Promote the use of water-efficient fittings to reduce water usage of health clinics infrastructures, in areas where climate projections indicate an increase in drought incidents.
- Promote solar direct drive refrigerator/freezer for vaccine storage and ice pack production in areas without reliable electricity supply, as well as providing back-ups in times of power outages resulting from disaster incidents.
- Promote the integration of passive design measures for health clinics that include the use of white roofs that reduce the heat absorption, improved ventilation, orientation, and shading of buildings to help maintain comfortable indoor temperatures, in areas where climate projections indicate a rise in temperatures.

- Include rainwater catchment systems on the health care clinics' roofs to mitigate runoff and feeds into underground tanks for a backup water supply, in areas where climate projections indicate decreased precipitation and an increase in intensity and frequency of extreme events such as droughts and/or heavy rainfall.
- Siting of new health care facilities/clinics follows climate risk assessments to avoid high-risk coastal areas, or areas that are prone to damage from hurricanes, windstorms, floods, or water surges, including rising sea levels associated with climate change
- Planting vegetation has a cooling effect on the environment, as well as improving groundwater infiltration. The establishment of green spaces in health care designs, could help reduce heat stress in the surrounding area where temperatures are projected to increase, as well as reducing flooding incidents by providing effective storm management through improved infiltration.
- Promote household vegetable and nutrition gardens (Keyhole and vertical gardens – using drought-tolerant crops e.g. Kales, spinach, onions) can play an important role in enhancing continuous household food security and dietary diversity, by utilizing greywater and kitchen waste. This is critical for nutrition programmes, where climate projections indicate a decrease in rainfall patterns and/or an increase in drought events that exacerbate food and nutrition insecurity.

7.3 Education:

- Inclusion of climate change and adaptation literacy in school programs, to raise awareness of climate change risks and promote skills and adaptation knowledge.
- Promote the use of water-efficient fittings to reduce water usage of education infrastructures, in areas where climate projections indicate an increase in drought incidents.
- Promote the establishment of school disaster risk management, with school management committees and parent teacher associations (PTAs) proactively working to reduce the vulnerability of schools and students through school disaster mapping and hazard simulations.
- Ensuring that siting of new classrooms follows climate risk assessments to avoid high-risk coastal areas, or areas that are prone to damage from hurricanes, windstorms, floods, or water surges, including rising sea levels associated with climate change.
- Promote the integration of passive design measures for classes that include the use of white roofs that reduce the heat absorption, improved ventilation, orientation, and shading of buildings to help maintain comfortable indoor temperatures, in areas where climate projections indicate a rise in temperatures.
- Include rainwater catchment systems on the school roofs to mitigate runoff and feeds into underground tanks for a backup water supply, in areas where climate projections indicate decreased precipitation and an increase in intensity and frequency of extreme events such as droughts and/or heavy rainfall.
- Planting vegetation has a cooling effect on the environment, as well as improving groundwater infiltration. The establishment of green spaces in the school designs, could help reduce heat stress in the surrounding area where temperatures are projected to increase, as well as reducing flooding incidents by providing effective storm management through improved ground infiltration.
- Promote school vegetable and nutrition gardens (using drought-tolerant crops e.g. Kales, spinach, onions) can play an important role in enhancing continuous food security and dietary diversity, by utilizing greywater and school kitchen wastes. This is critical for school feeding programmes, where climate projections indicate a decrease in rainfall patterns and/or an increase in drought events that exacerbates food and nutrition insecurity.

8.Annexes

8.1 Glossary

Base year	A historic datum (a specific year or an average over multiple years) against which a company's emissions are tracked over time.
Base year emissions	GHG emissions in the base year.
Baseline	A hypothetical scenario for what GHG emissions, removals, or storage would have been in the absence of the GHG project or project activity.
Biofuels	Fuel made from plant material, e.g. wood, straw, and ethanol from plant matter.
Carbon budget	The amount of CO_2 the world can emit while still having a likely chance of limiting warming to the 2°C target.
Carbon Footprint	The total amount of greenhouse gases that are emitted into the atmosphere each year by a person, family, building, organization, or company. A person's carbon footprint includes greenhouse gas emissions from fuel that an individual burns directly, such as by heating a home or riding in a car. It also includes greenhouse gases that come from producing the goods or services that the individual uses, including emissions from power plants that make electricity, factories that make products, and landfills where trash gets sent.
Carbon neutrality	Carbon neutrality means every ton of anthropogenic CO_2 emitted is compensated with an equivalent amount of CO_2 removed (e.g. via carbon sequestration)
Carbon sequestration	The uptake of CO_2 and storage of carbon in biological sinks.
Carbon sink	Any physical unit or process that stores greenhouse gases. Examples of these include forests, soils, and underground/deep-sea reservoirs of CO_2.
Certified Emission Reductions	A unit of emission reduction generated by a CDM project. CERs are tradable commodities that can be (CERs) used to commitments under the Kyoto Protocol.
Climate change adaptation	An action or combination of actions that reduce the vulnerability of an individual, household, population group, infrastructure, or system (e.g. urban area) to the adverse impacts of climate change.
Climate change	Any significant change in the measures of climate lasting for an extended period. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer.

Climate change mainstreaming	Integration of climate change adaptation and mitigation into related organization policies in several sectors. Mainstreaming can also involve setting up institutional or organizational structures, or designing and implementing projects in a way that they 'automatically' take climate change adaptation and mitigation into account.
Climate change mitigation	Technological change and/or substitution that reduces resource inputs and emissions per unit of output with respect to climate change.
Climate change screening	A systematic process of examining activities, outputs and programmes to identify their vulnerability to climate change, including assessment of the extent to which vulnerability is being or could be addressed.
Climate neutrality	It is the same concept as carbon neutrality but rather than solely focusing on CO_2 emissions, it extends to zero net anthropogenic greenhouse gas emissions (i.e. including emissions beyond carbon dioxide).
CO_2 equivalent (CO2-e)	The universal unit of measurement to indicate the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.
Direct GHG emissions	Emissions from sources that are owned or controlled by the reporting company.
Disaster Risk Reduction	The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.
Emission factor	A factor allowing GHG emissions to be estimated from a unit of available activity data (e.g. tonnes of fuel consumed, tonnes of product produced) and absolute GHG emissions.
Emissions	The release of GHG into the atmosphere.
Environmental Impact Assessment (EIA)	A tool used to identify the environmental, social, and economic impacts of a project before decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment, and present the predictions and options to decision-makers.

Carbon credit	A permit that allows an organization that holds it to emit a certain amount of carbon dioxide or other greenhouse gases.
GHG offset	Discrete GHG reductions used to compensate for (i.e., offset) GHG emissions elsewhere, for example to meet a voluntary or mandatory GHG target or cap. Offsets are calculated relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the mitigation project that generates the offsets.
GHG source	Any physical unit or process which releases GHG into the atmosphere.
Global Warming Potential (GWP)	A factor describing the radiative forcing impact (degree of harm to the atmosphere) of one unit of a given GHG relative to one unit of CO_2.
Green power	A generic term for renewable energy sources and specific clean energy technologies that emit fewer GHG emissions relative to other sources of energy that supply the electric grid. Includes solar photovoltaic panels, solar thermal energy, geothermal energy, landfill gas, low-impact hydropower, and wind turbines.
Greenhouse Gas (GHG)	The atmospheric gases responsible for causing global warming and climate change. The six Kyoto Protocol classes of greenhouse gases are carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), per- fluorocarbons (PFCs) and Sulphur hexafluoride (SF6).
Indirect emissions	Emissions that are a consequence of the operations of the reporting organization, but occur at sources owned or controlled by another company or organization (e.g. Power purchase, third party transport of fuels, materials, and finished products to and from locations).
Intergovernmental Panel on Climate Change (IPCC)	An international body of climate change scientists. The role of the IPCC is to assess the scientific, technical, and socio-economic information relevant to the understanding of the risk of human-induced climate change.
Inventory	A quantified list of an organization's GHG emissions and sources.
Inventory boundary	An imaginary line that encompasses the direct and indirect emissions that are included in the inventory. It results from the chosen organizational and operational boundaries.
Low emission development	Development activities that aim to reduce greenhouse gas emissions and increase carbon sequestration.
Net zero carbon emissions	considered a synonym for carbon neutrality. One key difference, however, is carbon neutrality can be achieved at the domestic level with offsets from other jurisdictions, while net zero emissions does not have the same connotation (though theoretically could be met via

	offsets). Both terms risk overshooting the carbon budget unless complemented by short-term emissions reduction targets.
Net zero GHG emissions	can be confused with net-zero carbon emissions, but when accurately used, means all greenhouse gas emissions decline to zero, as opposed to just carbon dioxide. This is the same concept as net zero carbon emissions but conveys a net zero emissions target for CO_2 and all non-CO2 gases.
Offset	Discrete greenhouse gas reductions used to compensate for (i.e. offset) greenhouse gas emissions elsewhere, for example to meet a voluntary or mandatory greenhouse gas target or cap. Carbon offsetting involves calculating a person or entity's greenhouse gas emissions, they can then purchase credits from projects involved in emission reduction that have either prevented or removed the emission of an equivalent amount of greenhouse gas elsewhere.
Organizational boundaries	The boundaries that determine the operations owned or controlled by the reporting entity, depending on the consolidation approach taken (equity or control approach).
Renewable energy	Energy taken from sources that are inexhaustible, e.g. wind, water, solar, geothermal energy, and biofuels.
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.
Scope	The operational boundaries in relation to indirect and direct GHG emissions.
Scope 1 Emissions	Also known as 'Direct emissions. Scope 1 emissions are produced from sources within the boundary of an organization and because of that organization's activities.
Scope 2 Emissions	Also known as 'Energy indirect emissions' are emissions associated with the generation of electricity, heating/ cooling, or steam purchased for own consumption.
Scope 3 Emissions	Also known as 'other indirect emissions' are emissions that occur outside the boundary of a facility under the operational control of the agency (and which are not considered scope 2 emissions).
Strategic Environmental Assessment (SEA)	A systematic process for evaluating the environmental consequences of a proposed policy, plan or programme initiatives to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations.

Reduction targets	Clearly-defined pathway for organizations to reduce greenhouse gas (GHG) emissions.
Verification	An independent assessment of the reliability (considering completeness and accuracy) of a GHG inventory.

8.2 Acronyms

ACC	AFOLU Carbon Calculator
ADRA	Adventist Development and Relief Agency
CCA	Climate change adaptation
CCC	Climate change champions
CCM	Climate change mitigation
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CMDRR	Community Disaster Risk Reduction Committees
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CRA	Climate Risk Assessment
CRS	Climate Risk Screening
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
ETS	Emissions Trading Systems
FBO	Faith-based organization
GHG	Greenhouse Gas
$GtCO_2e$	Gigatons of Carbon dioxide equivalent
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
INDCs	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
LTSs	Long-term Strategies
NAPA	National Adaptation Programme of Action
NDCs	Nationally Determined Contributions
REA	Rapid Environmental Assessment
SEA	Strategic Environmental Assessment
UNFCC	United Nations Framework Convention on Climate Change

8.3 Links to Key Resources and Tools

Climate risks adaptation solutions

- Climate-resilient practices in Agricultural development projects; http://www.fao.org/3/cb3991en/cb3991en.pdf
- Nature-based solutions for adapting to water-related climate risks: https://unfccc.int/sites/default/files/resource/OECD.pdf
- Guidance on Water and Adaptation to Climate Change: https://unece.org/DAM/env/water/publications/documents/Guidance_water_climate.pdf

Climate Screening tools

- Climate Risk Assessment Services for agri-food sector: (http://edepot.wur.nl/471420)
- UNDP Social and Environmental Screening Procedures (SESP): (https://www.undp.org/publications/undps-social-and-environmental-screening-procedures-sesp)
- World Bank Climate and Disaster Risk Screening Tools (Requires a registration to freely access the tools) https://climatescreeningtools.worldbank.org/
- Integrating the environment and climate change into EU international cooperation and development: https://europa.eu/capacity4dev/pg/documents/new-guidelines-integrating-environment-and-climate-change-eu-international-cooperation-0

Environmental Assessment Tools

- Climate Risk and Vulnerability Assessment Tool: http://cridf.net/wpcontent/uploads/2019/08/Knowledge_Product_Tool-2
- Tear Fund Environmental Impact Assessment Tool: (EA current.indd(tearfund.org)
- USAID Environmental Impact Assessment Tool: EIA Tool_Revised_4Dec2017_FINAL.pdf (usaidgems.org)
- Guidelines for Rapid Environmental Impact Assessment in Disasters: https://eecentre.org/wpcontent/uploads/2018/01/REA_2018_final-6.pdf
- Environmental Needs Assessment in Post-Disaster Situations https://wedocs.unep.org/bitstream/handle/20.500.11822/17458/env_needs_assmt_post_disaster.pdf?sequence=1&isAllowed=y

Climate Proofing Guides

- Technical guidance on the climate proofing of infrastructure in the period 2021-2027 https://ec.europa.eu/clima/sites/default/files/adaptation/what/docs/climate_proofing_guidance_en.pdf
- Environmentally friendly architecture designs: https://publications.iadb.org/publications/english/document/Environmentally-Friendly-School-Infrastructure.pdf
- A Practical Guide to Climate-resilient Buildings & Communities https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/36405/Adapbuild.pdf
- Guidelines for Climate Proofing Investment in the Water Sector: https://www.adb.org/sites/default/files/institutional-document/219646/guidelines-climate-proofing-water.pdf
- Guidelines for Climate Change Proofing in UNDP Projects and Programmes: https://www.uncclearn.org/wp-content/uploads/library/unssc04.pdf

- Rise Up Against Climate Change, a school-centered educational initiative of the Inter-American Development Bank (https://publications.iadb.org/publications/english/document/Environmentally-Friendly-School-Infrastructure.pdf).

Videos

Agriculture, Forestry and Other Land Use (AFOLU) Carbon Calculator Short Tutorial Videos;

- Afforestation and Reforestation Tool: https://youtu.be/JVMqctHbbjc
- Agroforestry Tool: https://youtu.be/HqcGoNTGYfQ
- Cropland Management Tool: https://youtu.be/jHb680l99yk
- Forest Degradation by Fuelwood Tool: https://youtu.be/ClnT53VYq7w
- Forest Protection Tool: https://youtu.be/aZX-5XdZTlU
- Grazing Management Tool: https://youtu.be/Y2nxp8B3I1o
- Forest Management Tool: https://youtu.be/McRpy5-gFvY