United Nations
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Bassin du Congo

Congo Basin Climate Commission

A standardized and harmonized greenhouse gas protocol to support carbon market integrity and investment in climate-resilient economic activity in Congo Basin Climate Commission member countries

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Executive summary

2.1 Scope of the study

Carbon markets have grown rapidly in recent years but remain poorly developed in Africa. The African continent is endowed with vast carbon sinks and pools in its forests and water resources, including in the Congo basin, which plays a key role in regulating the global climate and provide a vast range of services to economies and communities. The forest in the Congo basin ranks second after the Amazon rainforest in terms of mitigating global anthropogenic carbon dioxide emissions, notably from the combustion of fossil fuels. Nevertheless, Africa receives almost no financial assistance or investment flows for the mitigation services it renders to the rest of the world.

Key reasons for the continent's failure to attract financing to support its carbon sequestration efforts include African countries' limited institutional capacity to manage vibrant carbon markets that can stimulate public and private sector investment, the low prices paid for forest carbon sequestration, and weak carbon market integrity. Building institutional capacity and market integrity can help African countries design more effective carbon pricing policies. Those policies should support the socioeconomic and environmental development of African countries and address their global climate commitments under the Paris Agreement on climate change and relevant commitments made by States at meetings of the Economic and Social Council of the United Nations.

The present study has been drafted with a view to addressing those challenges by facilitating the development of a standardized and harmonized protocol on greenhouse gas (GHG) emissions that provides for the harmonization of carbon emission accounting, verification, and reporting mechanisms. The study aims to support carbon market integrity, bolster institutional capacity, and boost private investment in inclusive green and blue economies in Congo Basin Climate Commission countries.

2.1 Greenhouse gas accounting and offsetting in the context of the global climate agenda

Managing GHG emissions and their socioeconomic repercussions across countries are long-standing public policy issues on the global agenda. Concern with GHG emissions can be traced back to global public concerns regarding the ozone layer in the mid-1980s. Increasingly urgent climate-related concerns led the United Nations to convene a number of high-level meetings and adopt or facilitate the adoption of key instruments on the climate, including the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), the sessions of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Conference on Environment and Development, the Kyoto Protocol to the

United Nations Framework Convention on Climate Change, the Paris Agreement on climate change, and the Warsaw Framework for REDD-plus.

Carbon trade occurs among countries in global markets. The parties to the Paris Agreement on climate change have adopted a series of rules to ensure the integrity of the global trade in carbon. Those rules allow countries, companies, and other entities to collaborate with a view to delivering on countries' nationally determined contributions to the global response to climate change. Each country can transfer carbon credits to other countries. To exclude double counting, countries must agree on harmonized international standards. Those standards require regional adaptation to local conditions. The Blue Fund of the Congo Basin Climate Commission has been established to finance projects in one of the most important regions on the planet in terms of its effect on the global climate. The standardization and harmonization of GHG accounting and offsetting mechanisms would strengthen regional carbon markets and improve national green and blue economic development.

2.1 Methodology for the development of a standardized and harmonized protocol on greenhouse gas emissions and improved market integrity in Congo Basin Climate Commission member countries

Strong evidence has emerged in recent decades that the planet is warming due to increasing GHG concentrations in the atmosphere. According to the Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), the world is likely to exceed the 1.5°C temperature threshold, agreed upon as a red line at the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change. To respond to that warning, immediate and concerted action from the global community, and from private and public sector stakeholders is urgently needed.

GHG accounting measures the concentration of six key Kyoto Protocol gases, namely carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). GHG reporting must convert all greenhouse gases to CO_2 equivalent using a Global Warming Potential (GWP) coefficient. The period commonly used for GWP is 100 years.

Carbon offsets refer to a reduction in GHG emissions and an increase in carbon storage to compensate for emissions that occur elsewhere (Broekhoff and others, 2019). Offsets are a good way for companies to invest in nature conservation or protection projects and gain carbon accounting benefits at reduced costs. They are used in developing countries to reduce the planetary carbon footprint. Harmonization and standardization of the accounting, reporting, and verification mechanisms are critical in order to sustain carbon offsetting processes across Africa.

Kyoto Protocol, adopted in 1997, provided for the establishment of flexible market offsetting mechanisms, including international emissions trading and the joint implementation of the

clean development mechanism. The Protocol also established a rigorous monitoring, review, compliance, and verification system to strengthen the integrity of carbon markets.

Carbon accounting is a relatively new concept and incorporates the use of innovative technologies and the application of new ideas and standards. Currently, there are many established standards and consulting companies providing accounting services. Companies often find it difficult to decide which standards and methodologies to use. There are, however, clear advantages associated with the use of internationally recognized standards, protocols and methodologies rather than locally developed guidelines.

Standards and protocols establish accounting rules and procedures for GHG monitoring, reporting, verification and certification. They define project eligibility, additionality and baselines. Standards are often supplemented by methodologies and guidelines. They provide formulas and data for calculating emissions.

The terms standards, registries and programmes are often used interchangeably. Some international offset programmes are called standards or registries. Examples include the Verified Carbon Standard, the Gold Standard, the American Carbon Registry and The Climate Registry. Unlike standards, offset programmes include three components: (a) they develop and approve standards that set criteria for the quality of carbon offset credits; (b) they review offset projects against those standards (generally with the help of third-party verifiers); and (c) they operate registries that issue, transfer, and retire offset credits.

A number of different standards, programmes, and registries are currently used in Congo Basin Climate Commission countries. The different methodologies used result in different assessments of GHG inventories. Inconsistent results undermine carbon market integrity and enthusiasm among market stakeholders. Standards must be harmonized in order to ensure the accuracy and consistency of results. The Corporate Accounting and Reporting Standard, developed by Greenhouse Gas Protocol, (Greenhouse Gas Protocol (GHGP), 2004) a multi-stakeholder initiative convened by the World Business Council for Sustainable Development and the World Resources Institute, is the most appropriate basis for the development of a standardized and harmonized GHG protocol in the Congo basin. That standard is fully consistent with International Organization for Standardization (ISO) climatic standards and is very similar to the other initiatives used in the Congo basin and beyond.

2.1 Current greenhouse gas emission market practices in the Congo basin

Carbon markets in Congo Basin Climate Commission countries are very diverse. Different organizations receive rights (credits or permits) from States to emit limited GHGs under the various jurisdictions and management systems in use in the subregion. The rights to emit are treated as commodities for the purposes of national and international trade. An organization that wishes to increase its emissions can purchase rights from a counterpart that emits fewer or sequesters carbon emissions from the atmosphere. Carbon credits should only be issued to projects that have genuinely reduced or avoided carbon emissions. An independently

maintained registry must be used to keep track of all projects, emission credits and related transactions in order to support market integrity.

The majority of current GHG projects in the Congo basin are implemented within the context of the clean development mechanism and the reducing emissions from deforestation and forest degradation (REDD+) mechanism. The fourteenth session of Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Poznan, assigned a plus sign to REDD by adding preservation activities, namely conservation, sustainable management, and enhancing forest carbon stocks, in developing countries. This is a good opportunity for developing countries to receive payments for results-based actions on storing forest carbon.

The UNFCCC secretariat bears overall responsibility for maintaining a global registry of carbon units. There are also various regulatory bodies at the national and regional levels to oversee and monitor carbon market transactions. A number of voluntary carbon markets have also established registries.

According to Forest Trends, a non-profit organization founded in 1998, there were 3,328 offsetting projects worldwide as of 2022. Only 98 of those projects were in Africa, however (2.9 per cent of the total). Over half of those projects (51 projects or 1.6 per cent of the total) were in the 17 Congo Basin Climate Commission countries, but about 7 of those States based on the data available by the time of our survey, namely Cameroon (5 projects), Democratic Republic of the Congo (7 projects), Gabon (1 project), Kenya (11 projects), United Republic of Tanzania (12 projects), Uganda (12 projects) and Zambia (3 projects). Furthermore the offsetting projects that have been launched in Congo Basin Climate Commission countries have different operating modalities and funding mechanisms.

Fewer than half the projects are active (24 out of 51). The other 27 projects are still in the development phase. The following three types of projects have attracted funding: afforestation and reforestation (24 projects), avoided forest conservation (10 projects) and REDD+ (11 projects). The main funding mechanisms used are compensatory mitigation (36 projects), and voluntary offsets and compensation (carbon, water, biodiversity) (35 projects).

Based on information obtained by means of a survey, a major obstacle to investment in climate projects is the extremely low price of carbon credits in voluntary carbon markets, which is often much lower than the price in regulated compliance systems. According to European Union Emissions Trading System data, the global average price is $3.40 per metric ton of carbon dioxide equivalent ($mtCO_2e$) in voluntary markets and $65.00 per ton in regulated compliance markets.

The overall global trend is positive, however. In 2021, for example, the average price of a carbon credit rose from $2.50 to $3.50 per $mtCO_2e$. The price is expected to rise further and range between $50.00 and $120.00 per $mtCO_2e$ by mid-century (Ross-Thomas and Rathi, 2021).

Many mitigation projects in Congo Basin Climate Commission countries have been successful and offer significant potential for scale up. The formulation of a standardized and harmonized

protocol on GHG emissions and the launch of a subregional GHG programme would undoubtedly strengthen the offsetting market in the subregion and, potentially, in other African subregions.

2.1 A standardized and harmonized protocol for selected sectors in Congo Basin Climate Commission countries

The aim of the proposed standardized and harmonized GHG protocol is to provide a consistent approach to GHG accounting, reporting, and trading schemes in the Congo Basin Climate Commission subregion. The proposed protocol has been modelled on the GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2004) but takes into account local practices and experiences in offsetting projects in the subregion. The proposed protocol is set out in annex 2 to the present study.

Four supplemental sectoral outlooks have also been developed to facilitate carbon project development. The four sectors were selected in view of their importance in the Congo Basin Climate Commission subregion. Those sectors are: (a) improved forest management (annex 2a); (b) energy efficiency/cleaner cookers/efficient cookstoves (annex 2b); (c) agricultural soil enrichment (annex 2c), and; (d) rice cultivation (Annex 2d).

The sectoral outlooks complement the standardized and harmonized protocol. They should facilitate adoption of the standardized protocol and disseminate standard approaches and principles across the different sectors. The most important added value of this approach is that it makes it easy for users to visualize the steps that must be taken in a particular sector in order to develop and operate carbon offset projects. In other words, the protocol and outlooks should look and read like simple recipes. Any person endowed with basic skills in the sector should be able to understand and assess the relevant GHG inventory without too much difficulty.

The reporting template for the proposed standardized and harmonized GHG protocol, set out in annex 3 adopts a format that is applicable to all sectors. It is designed as a universal tool to enable standardized and harmonized reporting of GHG offsetting project outcomes. Individual project outcomes can be easily summed up at sectoral, municipal, national, and international levels. The template facilitates the collection and presentation of GHG accounting outcomes.

2.1 An efficient way to comply with standardized GHG protocols

Promoting an efficient carbon market in the Congo basin will require concerted action by the Congo Basin Climate Commission secretariat and Member States, including in the area of institutional capacity-building and by facilitating access to green investment capital. This will boost green and blue economic activity in the Congo basin and generate numerous tangible

and intangible socioeconomic and environmental benefits for the countries of the subregion and for local communities.

The GHG offsetting mechanism comprises the following elements: a GHG credit generator (project proponent), a standardized and harmonized GHG protocol (standard, methodology, guidance), a GHG accounting process (consultancy), a GHG independent verifier (third party), a GHG registry (operator) and a GHG market (buyer).

The GHG offset registry is designed to track relevant carbon offset projects, including their status, credits generated, and project ownership, sales, boundaries and retirement. The registry itself cannot check the quality of credits issued but must be used by an independent third-party verifier to ensure that credit quality reflects the GHG protocol methodology. After the credits are verified, they can be sold in compliance or voluntary over-the-counter markets. The GHG offset registry and the proposed standardized and harmonized GHG protocol together form a GHG offset programme. GHG programmes are created and managed by organizations with the capacity to provide carbon credit quality assurance guarantees.

At present, the carbon market in the Congo basin lacks the necessary liquidity for efficient trading to take place. Carbon credits are heterogeneous. Each credit has specific attributes associated, inter alia, with a particular GHG project type, protocol or programme. Discrepancies affect prices and deter potential buyers and investors. Inconsistencies among credits mean that market infrastructure is both expensive and inefficient.

Market infrastructure would be more efficient if all credits were issued under a common coordinated system based on a mutually-recognized GHG protocol. Using the standardized and harmonized GHG protocol for different offset programmes would ensure their mutual recognition by Congo Basin Climate Commission Member States. This task of the mutual recognition of the protocol can be successfully promoted under the auspices of the secretariat of Commission.

2.1 The way forward

There are more than 50 GHG offsetting projects currently in operation in Congo Basin Climate Commission Member States. That number is based on the responses to a survey conducted as part of the present study across all of those countries. Overall, the number of carbon offsetting projects is insufficient for a subregion that contains the world's second largest carbon sink after the Amazon rainforest. The subregion should support carbon market development in order to reap economic, social and environmental benefits. Despite huge carbon sequestration opportunities, carbon markets in the region remain poorly financed and fragmented and lack effective coordination mechanisms. This is a main reason why the subregion is characterized by low carbon prices, limited market demand, and a limited number of investors willing to invest in its Member States.

The Congo Basin Climate Commission secretariat should therefore take the lead in coordinating carbon market development in the Congo basin and address the aforementioned challenges. To that end, the secretariat may wish to establish and administer a Blue Fund for the Congo

Introduction

Basin offset programme. With sufficient political will among Congo Basin Climate Commission Member States it will be possible to take all necessary technical steps to that end, generating enormous socioeconomic and environmental benefits for the subregion and beyond.

Modern science has helped to deepen understanding of the links between global warming and atmospheric GHGs, including carbon dioxide (a long-lived climate forcer), and methane, nitrogen oxides and several other gases (short-lived climate forcers). Global warming causes climate change, weather extremes, biodiversity loss and floods, and gives rise to countless risks and threats to societies and economies. Accounting for, reporting and verifying GHG emissions has thus become an urgent priority for all countries striving to limit the impact of climate change. Accounting for GHG emissions should be a key driver of business and economic policies. Large public and private corporations, small and medium-sized enterprises, consumers, civil society organizations, academic institutions, investors, and legislators are now accepting GHG reporting as an integral part of their regular activities.

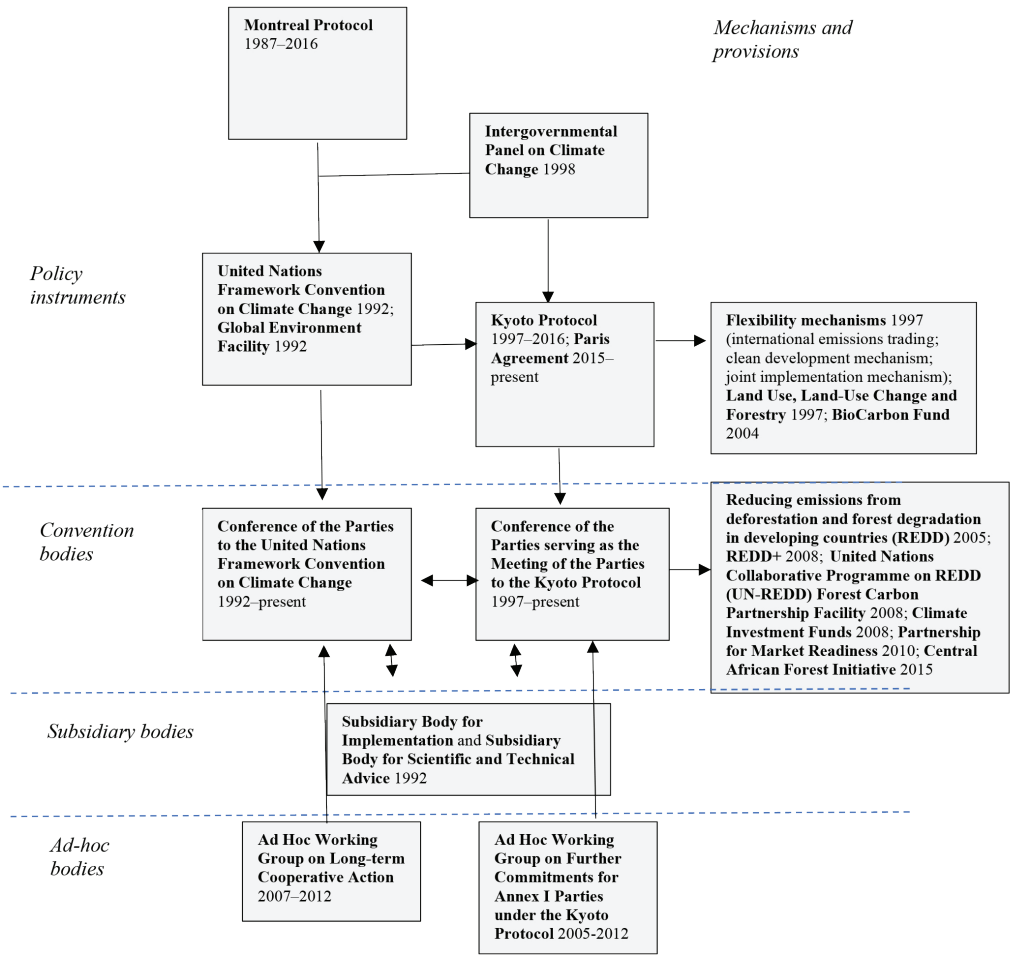
GHG reporting is often loosely labelled as "carbon footprint" reporting and provides and takes into account the most important anthropogenic GHG emissions. Emissions are generally expressed in metric tons of carbon dioxide equivalent ($mtco_2e$). The carbon footprints of companies, businesses and products include direct and indirect emissions. Direct emissions take place on site because of productive activities. Indirect emissions occur upstream or downstream of the direct emission process. Those emissions are generated by the same producers but are beyond their direct control and are not directly related to the activities of the producer. In short, however, companies are responsible for reporting all emissions that are traceable to their business activities.

Given the increasing complexity of the commercial relations among companies, it is very important to avoid double accounting and shield companies from excessive tax and reporting burdens. This is possible when the following GHG accounting and reporting principles are fully respected: relevance, completeness, consistency, transparency and accuracy. Those principles are also standard financial accounting principles. Any standardized and harmonized GHG protocol should incorporate all those principles. It should enhance the efficiency and integrity of markets and of supply and value chains. An advanced standardized and harmonized GHG protocol should also enhance the transparency and predictability of transactions of credits earned as a result of reduced GHG emissions

1. Greenhouse gas accounting and offsetting in the context of the global climate agenda

As mentioned previously, managing GHG emissions and their socioeconomic repercussions across countries are long-standing public policy issues on the global agenda. Concern with GHG emissions can be traced back to global public concerns regarding the ozone layer in the mid-1980s. Increasingly urgent climate-related concerns led the United Nations to convene a number of high-level meetings and adopt or facilitate the adoption of key instruments on the climate, including the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in 1987. Those instruments are illustrated in figure 1.

Figure 1: Global context for the proposed standardized and harmonized GHG protocol



Montreal Protocol: Adopted in 1987, the Montreal Protocol paved the way for the global climate agenda. The Protocol provided for efforts to protect the world from ozone depletion by phasing out certain industrial gases, substances and aerosols. Scientists believed that certain gases, including chlorofluorocarbons, hydrochlorofluorocarbons and halons were damaging the atmospheric ozone layer. These substances were widely used in refrigerators and solvents. The Montreal Protocol entered into force in 1989 and has been amended on nine occasions. Following the entry into force of the Protocol, the ozone hole over Antarctica started to close and is expected to close up completely between 2050 and 2070. At the same time that the international community was striving to address the issue of atmospheric ozone depletion, increasing attention was being paid to global warming.

Intergovernmental Panel on Climate Change (IPCC): IPCC was established in 1988 as an intergovernmental body responsible for regular scientific assessments on climate change. The Panel is a joint initiative of the World Meteorological Organization (WMO), and the United Nations Environmental Programme (UNEP), brings together 195 Member States and is headquartered in Geneva. The initial report of the Panel, issued in 1990, laid the groundwork for the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992.

United Nations Framework Convention on Climate Change (UNFCCC): The United Nation Conference on Environment and Development, also known as Rio de Janeiro Earth Summit, was held in 1992 in Rio de Janeiro. At the Conference, three key conventions were opened for signature:

- Convention on Biological Diversity;
- United Nations Framework Convention on Climate Change;
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.

UNFCCC has become a key international instrument on climate change and GHG reporting. The Convention provides for the convening of annual Conferences of the Parties. Each Conference of the Parties acts as a decision-making body responsible for monitoring and reviewing the implementation of the Framework Convention, and brings together representatives of the 197 nations and territories that have signed the Convention.

Subsidiary Body for Implementation (SBI) and Subsidiary Body for Scientific and Technical Advice (SBSTA): Two subsidiary bodies were established in 1992 to assist the Conference of the Parties: SBI is a multidisciplinary body established to review implementation of the Convention. It meets twice a year; SBSTA is another multidisciplinary body that also meets twice a year and advises the Conference of the Parties on matters of science, technology, and methodology. The two bodies work together on crosscutting issues that touch on both their areas of expertise. These include the vulnerability of developing countries to climate change and response measures.

Global Environmental Facility: This facility administers several funds established within the context of UNFCCC, including the Least Developed Countries Fund and the Special Climate Change Fund. The Facility was established on the eve of the 1992 Rio Earth Summit to assist in the protection of the global environment and to promote environmentally sustainable development. The Facility supports the implementation of several multilateral environmental agreements and serves as a financial mechanism of UNFCCC and the Paris Agreement. It is the longest standing dedicated public climate change fund.

Kyoto Protocol: Participants at the first Conference of the Parties, held in 1995 in Berlin, agreed that stabilizing their GHG emissions at 1990 levels by 2000 was insufficient. Subsequent negotiations led to the adoption of the Kyoto Protocol in 1997. The Kyoto Protocol adopted a new agenda on GHGs and addressed seven greenhouse gases in Annex A, including carbon dioxide (CO_2), Methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). Thirty-eight developed countries made a commitment to reduction targets and timetables. The Protocol set out GHG reductions for several countries for the period 2008 to 2012. In 2012, the Doha Agreement extended the Protocol until 2020. In 2009, negotiations failed to reach legally binding arrangements and the Copenhagen Accord was drafted. That Accord, was, however, neither legally binding nor endorsed by the broader international community. Following that setback, further negotiations led to the adoption of the Paris Agreement in 2015. The Kyoto Protocol, which was signed in 1997 and was in force between 2005 and 2020, established the initial framework for the implementation of measures under the terms of UNFCCC.

BioCarbon Fund: The BioCarbon Fund was established in 2004 as a public-private initiative under the auspices of the World Bank. The Fund supports projects that generate "multiple revenue streams, combining financial returns from the sale of emission reductions (i.e., carbon credits) with increased local incomes and other indirect benefits from sustainable land management practices". The Fund supports more than 20 projects, which are placed in two categories, namely UNFCCC clean development mechanism projects and Verified Carbon Standard projects. The first two tranches of the BioCarbon Fund were made available in 2004 and 2007 and are now closed to new fund participation. In 2013, the BioCarbon Fund launched a new initiative to support forest landscapes, namely the Initiative for Sustainable Forest Landscapes, which has been capitalized by means of a new tranche of funding from the Fund. The initiative supports developing countries' efforts to reduce emissions by testing jurisdictional approaches that integrate efforts to reduce deforestation and degradation, sustainable forest management and climate smart agricultural practices. The Initiative for Sustainable Forest Landscapes funds large-scale programmes to encourage farmers to modify their farming practices and provides input to policymakers at the international level. Further information about the BioCarbon Fund is available at: www.biocarbonfund.org.

Kyoto Protocol-defined flexibility mechanisms: These mechanisms, endorsed in 2007, include international emissions trading, the clean development mechanism, and joint implementation.

- International emissions trading allows parties to the Kyoto Protocol to buy "Kyoto units", namely emission permits for GHGs from other countries to help meet their domestic reduction goals;

- Through clean development mechanism projects, countries can buy GHG reduction units from non-Annex I parties. Non-Annex I parties receive financial incentives;

- Via the joint implementation mechanism, countries may invest in emission reduction projects (joint implementation projects) with other Annex I countries to reduce their domestic emissions. Non-Annex I parties do not have emission restrictions, but they benefit from financial incentives to develop GHG reduction projects in order to obtain certified emission reductions, which they can then sell to Annex I parties while contributing to sustainable development.

Land Use, Land-Use Change and Forestry: Under the terms of the Kyoto Protocol, Annex I countries can take into account afforestation, reforestation, deforestation and other agreed land use, land-use change and forestry activities in meeting their commitments. Under the Protocol, countries adopted targets for industrialized countries and guidelines on land use, land-use change and forestry activities. The main feature of the 1997 Kyoto agreement was that credits from land use, land-use change and forestry projects or activities could serve to offset industrial emissions. Put more simply, the larger the amount of biological carbon sequestration entering the system, the smaller the reductions required from the burning of fossil fuel. The Kyoto Protocol was superseded by the Paris Agreement, which entered into force in 2016.

Ad-Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol and the reducing emissions from deforestation and forest degradation (REDD) mechanism: The Ad-Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol was established at the eleventh session of the Conference of the Parties to the United Nations Framework Convention on Climate Change and the first session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, held in Montreal in 2005. The Working Group discussed future commitments by industrial countries under the Kyoto Protocol. At the eighth session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, held in 2012, participants decided to dissolve the Working Group, as it had fulfilled its mandate. Participants at the eleventh session of the Conference of the Parties also negotiated the reducing emissions from deforestation and forest degradation in developing countries (REDD) mechanism as a mitigation measure against deforestation in natural forests.

Bali Action Plan and Ad Hoc Working Group on Long-term Cooperative Action: The Ad Hoc Working Group on Long-term Cooperative Action (AWG-LCA) was established in 2007 pursuant to a decision issued by the thirteenth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change and the third session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol. The Ad Hoc Working Group was established to facilitate the sustained implementation of the Convention, and was dissolved following a decision issued by the eighteenth session of the Conference of the Parties, held in Doha in 2012.

REDD+: At the fourteenth session of the Conference of the Parties, held in Poznan, SBSTA introduced REDD+, which not only addresses deforestation and forest degradation but also the role of conservation, the sustainable management of forests and the enhancement of forest carbon stocks in developing countries. REDD+ incentivizes developing countries to keep their

forests standing by offering results-based payments for actions to reduce or remove forest carbon emissions.

United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD): A collaborative programme launched in 2008 by the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and UNEP, UN-REDD differs from REDD+. The latter is a voluntary climate change mitigation approach developed by the parties to UNFCCC.

Forest Carbon Partnership Facility (FCPF): Established in 2008 by the World Bank, FCPF is a global partnership of governments, businesses, civil society organizations and indigenous people organizations focused on reducing emissions from deforestation and forest degradation, forest carbon stock conservation, the sustainable management of forests, and the enhancement of forest carbon stocks in developing countries, activities commonly referred to as REDD+. FCPF now works with 47 developing countries across Africa, Asia, and Latin America and the Caribbean, along with 17 donors that have made contributions and commitments totalling $1.3 billion. The FCPF supports REDD+ efforts through two separate but complementary funds:

- **FCPF Readiness Fund:** This helps countries to set up the building blocks to implement REDD+ initiatives. This includes designing national REDD+ strategies, setting reference emission levels, designing measurement, reporting, and verification systems and setting up national REDD+ management arrangements, including appropriate environmental and social safeguards. Current funding: $400 million;

- **FCPF Carbon Fund:** This provides for results-based payments to countries that have successfully implemented REDD+ projects and have achieved verifiable emission reductions in their forest and broader land-use sectors. Current funding: $900 million (Forest Carbon Partnership Facility, 2022).

Climate Investment Funds: Established in 2008 with a capital of $8.5 billion, the Funds accelerate climate action by empowering transformation through clean technology, enhanced energy access, climate resilience, and the management of sustainable forests in developing and middle-income countries. Large-scale, low-cost, long-term financing lowers risks and the costs associated with climate financing. The Funds can be used to test new business models, establish track records in unproven markets, and boost investor confidence in order to unlock additional sources of finance. The Funds, which support 325 projects in 72 developing and middle-income countries, comprise two multi-donor trust funds, namely the Clean Technology Fund and the Strategic Climate Fund. Further information about the Funds is available at www.climateinvestmentfunds.org.

Copenhagen Green Climate Accord: The Accord was formally established at the sixteenth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change as an operating entity of the financial mechanism of the Convention. In

2011, the seventeenth session of the Conference of the Parties, held in Durban, adopted its governing instrument.

Cancun Agreement: The sixteenth session of the Conference of the Parties, held in Cancun, Mexico in 2010, called for the establishment of a $100 billion annual green climate fund, in addition to a climate technology centre and network, although the parties did not reach any agreement with regard to appropriate funding mechanisms in that regard. The sixteenth session also agreed that future global warming should be limited to below 2 C (3.6 F) relative to the pre-industrial global temperatures.

Green Climate Fund: Established in 2010, the Fund is part of the UNFCCC financial mechanism and aims to make an ambitious contribution towards the implementation of the Paris Agreement and its mitigation and adaptation goals by supporting a paradigm shift in developing countries towards low-carbon and climate-resilient development pathways. The Fund is currently the world's largest dedicated multilateral climate fund and the main multilateral financing mechanism to support developing countries in achieving a reduction in their GHGs and enhancing their ability to respond to climate change.

Partnership for Market Readiness: Established in 2010, the Partnership brings together developed and developing countries under the auspices of the World Bank. The aim of the Partnership is to use market instruments in order to scale up mitigation efforts, particularly in middle-income countries. Although initially geared towards promoting market readiness for the anticipated emergence of international carbon markets, the Partnership also provides grants and technical support for proposals for implementation of market tools that contribute to mitigation efforts. As of November 2020, cumulative pledges to the Fund amounted to approximately $130 million. Contributing countries and entities include Australia, Denmark, the European Commission, Finland, Germany, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom of Great Britain and Northern Ireland and the United States of America. Contributions from donor countries are classified as official development assistance.

Adaptation for Smallholder Agriculture Programme: Launched in 2012 by the International Fund for Agricultural Development (IFAD), the Programme channels climate and environmental finance to smallholder farmers. Incorporated into the regular investment processes of IFAD, it is subject to rigorous quality control and supervision systems. The Programme has received $300 million in contributions and has helped 8 million vulnerable smallholders in 43 countries to cope with the impact of climate change and build more resilient livelihoods. To date, two phases of the Programme have been implemented and a third phase, named the Enhanced Adaptation for Smallholder Agriculture Programme (ASAP+) is under development.

Warsaw Framework for REDD plus: Adopted at the thirteenth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Warsaw in 2013, the Warsaw Framework has been widely recognized as a breakthrough in negotiations, providing clarity on several important issues related to REDD+ implementation.

Central African Forest Initiative: Launched during the 2015 General Assembly of the United Nations, the Central African Forest Initiative is a collaborative partnership that brings together

UNDP, FAO, the World Bank, six Central African partner countries and a coalition of donors. The aim of the Initiative is to support governments in the region to implement reforms and mobilize investment to halt drivers of tropical deforestation. The Initiative supports country-level efforts to reduce emissions from deforestation and forest degradation and support the role of conservation, the sustainable management of forests and the enhancement of forest carbon stocks (REDD+) and also to mobilize low-emission development investments to mitigate climate change and reduce poverty. Further information about the initiative is available at: https://www.cafi.org.

Paris Agreement: Adopted at the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in 2015, the Agreement provides for efforts to keep the global rise in temperatures "well below 2 C" compared to pre-industrial levels. The Agreement calls for zero net anthropogenic GHG emissions to be reached during the second half of the twenty-first century. The parties to the Agreement also agreed to pursue efforts to limit temperature increases to 1.5 C. Scientists have calculated that the 1.5 C goal will require net zero emissions to be achieved sometime between 2030 and 2050 (Intergovernmental Panel on Climate Change, 2021). Net zero refers to a state in which the GHGs entering the atmosphere are offset by an identical amount of GHGs being removed from the atmosphere.

Agreement on modalities for an international emissions offsetting market: At the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in 2021, the parties agreed on the principles of an international offsetting market. It was agreed that carbon trading could occur on bilateral basis, with the United Nations exercising oversight of the emissions market. The parties to the Paris Agreement approved article 6, establishing a set of rules to ensure the integrity of carbon trading. Article 6 allows countries, companies and other stakeholders to cooperate with each other to deliver on the nationally determined contributions agreed pursuant to the Paris Agreement. For example, one country can transfer carbon credits for emission reductions to another country, but the seller and the buyer cannot both count those credits. In other words, the double counting of GHGs is prohibited.

2. Methodology and accounting principles for the proposed standardized and harmonized protocol and improved market integrity in the Congo basin

2.1 Benefits of GHG accounting

2.1.1. Need for measurement

In the past few decades, science has provided strong evidence that the planet is heating up due to the increasing concentration of greenhouse gases in the atmosphere. The combustion of fossil fuels, including oil and natural gas, forest fires, inefficient stoves, out of date agriculture and the growing energy needs of businesses and populations all contribute to increasing concentrations of GHGs in the planetary atmosphere. Governments, businesses and populations are now urgently calling for transparent and urgent action to be taken to address that issue. GHG accounting and verification has therefore become an important tool for mitigating the repercussions of global warming.

The Sixth Assessment Report of IPCC states that the concentration of CO_2 in the atmosphere is now the highest it has been in 2 million years, while sea levels are now rising faster than they ever have in the last 3,000 years. Meanwhile the Arctic ice sheet is at its lowest level in 1,000 years and Arctic sea ice cover has shrunk by some 40 per cent since 1979. The Sixth Assessment Report warns that the world is likely to exceed the 1.5°C temperature threshold, agreed upon as a red line in the Paris Agreement in 2015, in the next few decades (Intergovernmental Panel on Climate Change, 2021). That harsh warning requires immediate action.

Measurement

Carbon accounting is synonymous to footprint analysis and GHG stock taking. Typically, it means emission measurement of the six greenhouse gases specified in the Kyoto Protocol, namely carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The Global Warming Potential (GWP) is a tool to bring all measurements to one understandable and meaningful equivalent, namely metric tons of CO_2.

GWP is the heat absorbed by any greenhouse gas in the atmosphere, as a multiple of the heat that would be absorbed by the same mass of CO_2. GWP is 1 for CO_2. For other gases, it depends on the gas and the period. Companies or projects must report their emissions in metric tons using the GWP coefficient:

$CO_{2\ equivalent} = \sum(GHG_i \times GWP_i)$,

Where:

$CO_{2\ equivalent}$ - million metric tons of carbon dioxide equivalent.

GHG_i – greenhouse gas of i-type.

GWP_i – the global warming potential coefficient corresponding to GHGi.

i – type of the greenhouse gas, where i varies from 1 to n, and n is a natural number.

The GWP coefficient allows us to compare the impact of any gas on global warming. The greater the GWP, the more the gas warms the atmosphere compared to CO_2 over a given period. The period commonly used for the GWP is 100 years. Other time horizons may also be used, but they are provided as additional information. The latest GWP coefficients established by IPCC should be used. The most recent reliable data available are contained in the Sixth Assessment Report, issued in 2021. Otherwise, a justification should be given as to why the most recent IPCC data are not used.

Offsetting

Carbon offsets refer to a reduction in GHG emissions or an increase in carbon storage to compensate for emissions that occur elsewhere. Offsets are a good way for companies to invest in environmental protection projects and gain carbon accounting benefits at reduced costs. They are used in developing countries to offset other countries' or their own carbon footprints. Offsetting amounts depend on choices made by countries and businesses. One option is to be fully carbon neutral, another option is to offset a particular product or service. Environmental projects may cover a wide range of businesses and activities. However, they must be effective in removing GHGs from the atmosphere. This can be done through a range of activities such as creating or restoring natural habitats or investing in carbon capture technologies.

Carbon offsetting is not an exact science and yet it needs standardization. To date, it has been attractive to companies wishing to increase their market value. Many businesses are now aiming at net zero emissions. According to the recent data, global carbon markets grew to $272 billion in 2020, a fivefold increase since 2017 (Refinitiv, 2021). While there are many offset providers in the market, offsets should always be purchases from credible sources, such as the United Nations carbon offset platform or Gold Standard.

One important element of the Kyoto Protocol was the establishment of flexible market mechanisms to facilitate the trade in emissions permits. Under the Protocol, countries must meet their targets, primarily, through national measures. However, the Protocol also offers them additional means to meet their targets by the way of three market-based mechanisms, namely international emissions trading, the clean development mechanism, and joint implementation.

The Kyoto Protocol also established a rigorous monitoring, review and verification system, in addition to a compliance system, to ensure carbon market transparency. Under the Protocol, countries' actual emissions must be monitored, and transaction records kept.

- Registry systems track and record transactions by parties under the different offsetting mechanisms. The United Nations Climate Change Secretariat is based in Bonn, Germany. It keeps an international transaction log to verify that transactions are consistent with the rules of the Protocol;

- Parties report by submitting annual emission inventories and national reports under the Protocol at regular intervals;

- A compliance system ensures that parties are meeting their commitments and helps them when they have problems doing so;

- The Kyoto Protocol also provides for assistance to be given to countries to help them adapt to the adverse effects of climate change, including through the development and deployment of technologies that increase climate change resilience.

The Adaptation Fund was established in 2001 to finance climate adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol. In the first commitment period, the Fund was financed primarily by a share of proceeds from clean development mechanism project activities. In 2012, however, it was decided that, in the second commitment period, international emissions trading and joint implementation schemes would provide the Adaptation Fund with a 2 per cent share of proceeds. Further information about the Adaptation Fund is available at: www.adaptation-fund.org.

Benefits of GHG measuring, reporting and verification

Besides global concerns regarding climate change, there are also immediate and tangible benefits of GHG accounting. Those benefits may encourage companies to take action to reduce their carbon footprints. In particular, GHG accounting may enable companies to:

- Be more competitive. Measuring emissions can help businesses save money and become more efficient;

- Prepare for future climate policy. Companies are likely to be better positioned to take advantage of future carbon markets and comply with environmental regulations;

- Emerge as leaders in the low-carbon economy. Business is seen as a leader to vendors, customers and other key stakeholders;

- Track success. GHG accounting can set a baseline that enables companies to track progress toward climate goals.

Carbon accounting is a relatively new concept and incorporates the use of new technologies and the application of new ideas and standards. Currently, there are many established standards and consulting companies providing accounting services. Companies often find it difficult to decide which standards and methodologies to use. There are, however, clear advantages associated with the use of internationally recognized standards, protocols, and methodologies rather than locally developed guidelines. Use of those standards can:

- Ensure compliance with international norms;
- Improve the credibility of data with key stakeholders;
- Facilitate the identification of reduction opportunities from an accurate baseline;
- Enhance recognition;
- Improve internal data management.

Key issues that must be addressed

Double counting is one of the issues to be carefully handled when companies seek to measure their carbon footprints. In the context of climate change mitigation, double counting represents a situation in which a single GHG emission reduction or removal is used more than once to demonstrate compliance with mitigation targets. Double counting may occur where multiple mitigation mechanisms overlap and emission reductions are transferred among entities. Such double counting may take the following forms:

- Double claiming, where two or more parties claim the same emission reduction to comply with their mitigation targets as formulated in their nationally determined contributions to the global response to climate change;
- Double issuance, whereby more than one emission reduction unit is registered for the same mitigation benefit under different mitigation mechanisms, such as a sustainable development mechanism and a nationally determined contribution.

Other forms of double counting, such as double purpose, double finance or double use are also known but less relevant in GHG accounting. Double counting should be avoided to preserve the environmental and market integrity of mitigation mechanisms. Emission reductions being counted more than once imply an overestimation of mitigation results. Double counting can hinder the achievement of internationally agreed mitigation objectives and undermine the credibility of efforts to combat climate change.

Potential misconceptions regarding scope 3 emissions must also be taken into account in GHG accounting. Most emission accounting standards divide emissions into three broad categories (scopes):

- Scope 1 emissions are direct emissions under the control of a company;

- Scope 2 emissions come from the power, heat, steam and cooling that a company buys;

- Scope 3 emissions include emissions linked to a company's wider value chain. Those emissions can be roughly divided between those related to the upstream supply chain and to the downstream lifecycle of the producer's products and services.

Because of the relative complexity of scope 3 emissions, they remain the subject of much confusion. In general, however, scope 3 emissions make up a significant share of a company's total carbon footprint. A detailed understanding of those emissions is critical in efforts to identify climate-related investment risks and opportunities. The following points should be taken into consideration when dealing with the scope 3 emissions:

- Scope 1 and 2 emissions may not be sufficient to meet emissions targets if scope 3 emissions are not also taken into account. Scope 1 and 2 emissions in many productions often give a partial and misleading result. Ignoring scope 3 emissions in automobile production, for example, makes it impossible to distinguish between electric and gasoline-powered car producers and understand the full scale of transitional risks. Producers with large scope 1 and 2 emissions account for a relatively small portion of global economic activity. Indeed, producers with overweight scope 3 emissions predominate in the market and their numbers are growing. Scope 3 emissions account for most significant source of GHGs in the atmosphere;

- Companies must gain greater control over their scope 3 emissions. Firstly, companies are often able to reduce their scope 3 emissions directly by using fewer carbon-intensive technologies. Secondly, they may incentivize their supply chains to do the same. Even in rare cases in which companies have limited influence over their scope 3 emissions, they still may want to develop a strategy for shifting towards a net-zero economy;

- Approximations and third-party assessments can be used to supplement insufficient data. Even approximate figures are more useful than no scope 3 emission data at all;

- Delaying scope 3 analysis is unwise, may mislead investors and give rise to risks in the future, when scope 3 information is likely to be more accessible. At that point, investors may choose to invest in more environmentally sustainable businesses;

- High scope 3 emissions do not necessarily mean a competitive disadvantage. It is more environmentally friendly to invest in high-emission businesses that have established a robust decarbonizing trend than in low-carbon businesses that are moving in the opposite direction.

2.2 GHG emission standards, protocols, templates, methodologies, guidelines, programmes, registries and offsets

Differences between GHG emission standards, protocols, methodologies, programmes and registries can be confusing. Those terms are still loosely defined but broadly interpreted. Standards and protocols provide relevant stakeholders with a systematic approach. They establish principles and the documentation needed for data collection, reporting and verification. Standards provide assurances that data is adequate, complete, accurate and properly processed. Standards normally include protocols, methodologies and guidance documents and provide guidance and specifications on GHG quantification, monitoring, and reporting. Stand-alone standards typically do not have an associated entity that registers projects. They also do not specify registration and enforcement systems to track and ensure legal ownership of offset credits. In short, standards do not formally establish registration and enforcement systems. The use of standards alone is therefore not sufficient to guarantee the quality of offset credits. Many offset initiatives develop their own standards and protocols, however. They may also adopt internationally recognized standards, such as those developed by the International Organization for Standardization (ISO), in order to outline requirements and provide guidance for offset projects.

Standards and protocols present GHG accounting rules and procedures for monitoring, reporting, verification and certification. They define project eligibility, additionality and baseline and project emissions. Methodology development is a part of standards and protocols, but not necessarily complete and comprehensive. Standards are often supplemented by methodologies and guidelines, such as the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Intergovernmental Panel on Climate Change, 2006). The guidelines provide formulas and data for calculating emissions. According to IPCC, one should multiply original gas quantities by the relevant GWP coefficient in order to obtain total emissions. GWP coefficients are elaborated by IPCC.

An offset registry is a system for reporting and tracking offset project information, including project status, project documents, credits generated, ownership, sale and retirement. Offset programmes should use a registry.

The terms standards, registries and programmes are often used interchangeably. Some international offset programmes are called standards or registries. Examples include the Verified Carbon Standard, the Gold Standard, the American Carbon Registry and The Climate Registry. Unlike standards, offset programmes include three components: (a) they develop and approve standards that set criteria for the quality of carbon offset credits; (b) they review offset projects against those standards (generally with the help of third-party verifiers); and (c) they operate registries that issue, transfer, and retire offset credits.

2.3 GHG emission standards

2.3.1. Available standards

Table 1 sets out a number of standards and protocols that can be used to conduct sustainability reporting.

Table 1: Examples of GHG reporting standards and protocols

Guidance or standard	Jurisdiction	Focus	GHGs covered	Scope 1	Scope 2	Scope 3
Greenhouse Gas Protocol: Corporate Accounting and Reporting Standard	International	Published in 2004, revised. Internationally recognized procedure for preparing verifiable emission reports. Supported by calculation tools	All six Kyoto Protocol gases	Yes	Yes	Optional
ISO 14064-1, 2 and 3: GHG Accounting and Verification	International	Published in 2006. Modelled on the GHG Protocol. Used to quantify, report, and verify GHG emissions at organization and project level.	All six Kyoto Protocol gases	Yes	Yes	Optional
ISO 14067-1 and 2: Greenhouse gases – carbon footprint of products – requirements and guidelines for quantification	International	Standard to quantify and communicate the GHG emissions of goods and services.	All six Kyoto Protocol gases	Yes	Yes	Yes
IPCC Guidelines for National Greenhouse Gas Inventories	International	Published in 2006, provides methodologies for estimating national inventories	All six Kyoto Protocol gases	Yes	Yes	Yes
Climate Disclosure Standards Board	International	Developing standard guidelines for corporate reporting of emissions	All six Kyoto Protocol gases	Yes	Dependent on ownership	Optional
British Standards Institution Publicly Available Specification 2060: Specification for the Demonstration of Carbon Neutrality	International	Published in 2014. Details quantification, reduction and offsetting of GHG emissions to achieve/ demonstrate carbon neutrality	All six Kyoto Protocol gases	Yes	Yes	Yes

Guidance or standard	Jurisdiction	Focus	GHGs covered	Scope 1	Scope 2	Scope 3
Clean development mechanism	International	Launched in 1997. facilitates emission reduction (or emission removal) projects in developing countries	All six Kyoto Protocol gases	Yes	Yes	Optional
Joint implementation	International	Launched in 1997. Project-based mechanism based on article 6 of the Kyoto Protocol	All six Kyoto Protocol gases	Yes	Yes	Optional
European Union Emissions Trading System	Europe	Market-based instrument which allows for cost-effective and targeted environmental policies – no market intervention	All six Kyoto Protocol gases	Yes	Yes	Yes
United Kingdom, Department for Environment, Food and Rural Affairs. Guidance on how to measure and report your greenhouse gas emissions	United Kingdom	Published in 2009. Details procedures that organizations should adopt to measure and reduce GHG emissions	All six Kyoto Protocol gases plus other gases if this is deemed necessary	Yes	Yes	Discretionary
The Climate Registry: General Reporting Protocol	North America	First published in 2008. Guidelines and calculation tools for voluntary emissions reporting programmes	All six Kyoto Protocol gases plus a number of other gases	Yes	Yes	Optional

The main internationally recognized standards for reporting on the impact of climate change are the following:

- The **Greenhouse Gas Protocol** is a globally recognized organization that develops frameworks for the measurement and management of GHGs by public and private sector stakeholders. The standards developed by Greenhouse Gas Protocol serve as a basis for many reporting systems and certification programmes;

- The **Global Reporting Initiative** is an independent international organization that helps businesses, governments and other organizations understand and communicate the impact of businesses on critical sustainability issues such as climate change. Global Reporting Initiative formulates guidelines that reflect the perspective of a diverse range of stakeholders with a view to promoting transparency. Founded in the United States of America in 1997, Global Reporting Initiative moved its headquarters to

Amsterdam in 2002; it has established focal points in Australia, Brazil, China, India and the United States and a worldwide network of more than 30,000 professionals;

- The **Carbon Disclosure Project** is a global disclosure system for managing the environmental impact of private sector stakeholders. Carbon Disclosure Project questionnaires help the private sector to communicate its strategies for measuring emissions and managing risks associated with the climate change. The Project facilitates efforts by companies to establish climate strategies and allows them to compare their performance with other similar companies, including at the international level;

- **ISO** has established a set of relevant standards, including ISO 14064 and ISO 14065, that help organizations quantify and report on their GHG emissions. Other standards, including ISO 14001 and ISO 50001, help promote good practices in environmental and energy management;

- The **Climate Disclosure Standards Board** was an international consortium of businesses, and environmental and social non-governmental organizations committed to advancing corporate reporting models that equate natural social capital with financial capital. In 2021, the International Financial Reporting Standards Foundation announced that it would establish the International Sustainability Standards Board by June 2022 by amalgamating the Climate Disclosure Standards Board and the Value Reporting Foundation, which had developed the Integrated Reporting Framework and the Sustainability Accounting Standards Board Standards. Climate Disclosure Standards Board technical guidance will form part of the evidence base as the International Sustainability Standards Board develops its Sustainability Disclosure Standards. The Climate Disclosure Standards Board framework and technical guidance on water, biodiversity and social disclosures will remain useful for companies until the new Sustainability Disclosure Standards are issued on those topics;

- **British Standards Institution Publicly Available Specification 2060 (PAS 2060)** was launched in 2010 with a view to increasing transparency in connection with carbon neutrality claims. PAS 2060 sets out common definitions and methods for achieving carbon neutral status. It provides for a standard-compliant declaration of achievement of neutrality on the basis of a set of qualifying explanatory statements and the public disclosure of all documentation supporting a carbon neutrality claim. It stipulates three types of validation of the achievement of neutrality: self-validation, other party validation and third-party independent validation. Other party validation occurs when the methodology and data have been audited and verified by an external organization. Third-party independent validation should be provided by a registered agent;

- The **clean development mechanism** allows emission reduction (or emission removal) projects in developing countries, which can then earn certified emission reductions, each equivalent to one ton of CO_2. These certified reductions can be traded, sold and used by industrialized countries to meet their emission reduction targets under

the Kyoto Protocol. Emission reduction or removal projects must pass a rigorous public registration and issuance process designed to ensure real, measurable, and verifiable emission reductions. The clean development mechanism is overseen by an executive board. The mechanism allows participants to (a) earn certified emission reduction credits, which can be traded and sold to developed countries to meet their international obligations, and (b) achieve developing country emission reduction targets and foster sustainable development;

- **Joint implementation** was defined in article 6 of the Kyoto Protocol. It allows a country with a commitment under the Kyoto Protocol (an Annex B party) to earn emission reduction units from an emission-reduction or emission removal project in another Annex B party. An emission reduction unit is equivalent to one ton of CO_2 and can be counted towards meeting a country's Kyoto Protocol commitment. Furthermore, joint implementation allows host parties to benefit from foreign investment and technology transfer;

- The **European Union Emissions Trading System,** launched in 2005, is the Union's flagship initiative for reaching its climate targets under the Kyoto Protocol. Governments set an allowable total amount of emissions (a "cap") and issue tradable emission permits ("trade") in a cap-and-trade system. The permits, which are typically good for one ton of CO_2, are the currency used in carbon markets. The Emissions Trading System is a cornerstone of the Union's policy to combat climate change and a tool for reducing greenhouse gas emissions cost-effectively. The System facilitates the operation of the world's biggest carbon market and was the world's first large-scale greenhouse gas emissions trading scheme;

- **United Kingdom, Department for Environment, Food and Rural Affairs. Guidance on how to measure and report your greenhouse gas emissions.** The guidance issued by the Department for the Environment, Food and Rural Affairs was formulated to help all business enterprises, public entities and other organizations measure and report on their emissions. Those stakeholders are not, however, required to submit reports nor otherwise make their data available to the Government;

- **The Climate Registry General Reporting Protocol,** established in 2007, offers a unified GHG emission accounting system that allows accurate, consistent and verifiable reporting across sectors and geographic borders. Over 40 states in the United States of America, 7 Canadian provinces, and 6 Mexican states currently support the platform. Companies and organizations that join the Climate Registry agree to measure and publicly report their GHG emissions for all operations in the United States, Canada and Mexico. By reporting each year, companies and organizations provide a public record of their emissions over time. The General Reporting Protocol is based on the Corporate Accounting and Reporting Standard developed by Greenhouse Gas Protocol, an initiative launched by the World Resources Institute and the World Business Council for Sustainable Development. Building on the work of Greenhouse Gas Protocol ensures consistency with international accounting and reporting practices;

- The **Gold Standard for Global Goals** was designed to accelerate progress toward climate security and sustainable development. The Gold Standard enables initiatives to quantify, certify and maximize their impact toward climate security and the Sustainable Development Goals, while enhanced safeguards, holistic project design, management of trade-offs and local stakeholder engagement ensure that the Gold Standard continues to deliver the highest levels of environmental and social integrity. The Gold Standard is a holistic standard that integrates energy and waste, land use and forests, and water to maximize the benefits of each respective scope. With a single, streamlined certification process that reduces costs and complexity, the Gold Standard assesses the impact of project activities toward the achievement of the Sustainable Development Goals. It provides project developers with a tool to ensure that the clean development mechanism delivers credible projects with real sustainable development benefits. Carbon offset projects that satisfy Gold Standard requirements are granted permission to use the Gold Standard brand name and logo and sell their carbon credits with the Gold Standard label. A firm or organization wishing to register a project with the Gold Standard and obtain certification for the project's carbon credits follows the same steps as for the clean development mechanism, but must supply additional information at various stages of the process;

- The Verified Carbon Standard provides a robust, global standard and programme for approval of credible voluntary offsets. The Standard is presently the world's leading voluntary greenhouse gas programme. Its quality assurance principles ensure that all verified carbon units are real, measurable, additional, permanent, independently verified, conservatively estimated, uniquely numbered, and transparently listed. The benefits of using the Standard include: (a) increasing a project's profitability thanks to the additional funding provided by the verified carbon units; (b) improving a company's image, since this is a voluntary process; (c) boosting a company's competitiveness; (d) promoting sustainable development around the world, and; (e) meeting the emissions reduction targets established pursuant to the Kyoto Protocol;

- The Sustainable Development Verified Impact Standard is a flexible framework for assessing and reporting on the sustainable development benefits of project-based activities. The Standard programme sets out rules and criteria for the design, implementation and assessment of projects that aim to deliver high-impact sustainable development benefits. Under the Standard, projects must demonstrate that they comply with the programme's rigorous rules and requirements. Once projects have been certified under the Standard, their contributions towards the achievement of the Sustainable Development Goals are listed in the accompanying registry. Some projects may issue Sustainable Development Verified Impact Standard assets, namely units representing sustainable development benefits that can be sold, retired and claimed;

- The Climate, Community and Biodiversity Standards, developed by the Climate, Community and Biodiversity Alliance, can be used to identify projects that simultaneously addresses climate change, the interests of local communities and smallholders, and conserve biodiversity. The Standards identify land management projects that deliver net positive benefits and can be applied to any land management

project, including REDD+ projects. The Standards were developed with the aim of leveraging policies and markets to promote the development of forest protection, restoration, and agroforestry projects. Their use can help clients to achieve emission reductions while also strengthening efforts to conserve biodiversity and support local stakeholders;

- Social Carbon, an international GHG standard developed by a Brazilian non-governmental organization, can be used to certify carbon reduction projects and assess their contribution to sustainable development. The standard includes six aspects of project sustainability, collectively known as the Social Carbon hexagon. Each component of the hexagon addresses carbon and biodiversity in addition to social, financial, human, and natural aspects. The standard uses a set of analytical tools to assess the social, environmental and economic conditions of communities affected by emission reduction projects. A key feature of the standard is the active participation of local communities in certification activities, which helps to provide reliable and beneficial outcomes.

Although the above list of GHG standards, programmes and registries is far from complete, these provide an overview of the current GHG accounting agenda. The most important organization listed is Greenhouse Gases Protocol, which has established a basis for the development of the other mandatory and voluntary carbon standards, methodologies and programmes.

2.3.2. International Standards Organization environmental standards relevant to greenhouse gas emissions

The International Standards Organization (ISO) has produced over 570 environment-related standards, including those that can be used to monitor climate change, quantify GHG emissions and promote good practice in environmental management and design. Those standards can help stakeholders address climate change and support the efforts of developed and developing countries in relation to mitigation and adaptation. The objective of ISO standards is to facilitate international cooperation by facilitating communication on technical issues among industry, government, consumers and other stakeholders and allowing consistency of products and services across national boundaries. ISO has a set of environmental standards related to GHG:

- ISO 14000 family – "Environmental management" is for companies that require practical tools to manage their environmental responsibilities;

- ISO 14064 "Greenhouse Gases" helps organizations to quantify and report their GHG emissions;

- ISO 14065:2020 "General principles and requirements for bodies validating and verifying environmental information" specifies principles and requirements for entities performing validation and verification of environmental information statements;

- ISO 14066:2011 "Greenhouse gases – competence requirements for greenhouse gas validation teams and verification teams" specifies competence requirements for validation teams and verification teams, and complements the implementation of ISO 14065. It is not linked to any particular GHG programme. However, if a particular GHG programme is applicable, competence requirements of that programme are additional to the requirements of ISO 14066;

- ISO 14067:2018 "Greenhouse gases – carbon footprint of products – requirements and guidelines for quantification" specifies principles, requirements and guidelines to assess and report on the carbon footprint of a product in a manner consistent with relevant International Standards on life cycle assessment (ISO 14040 and ISO 14044);

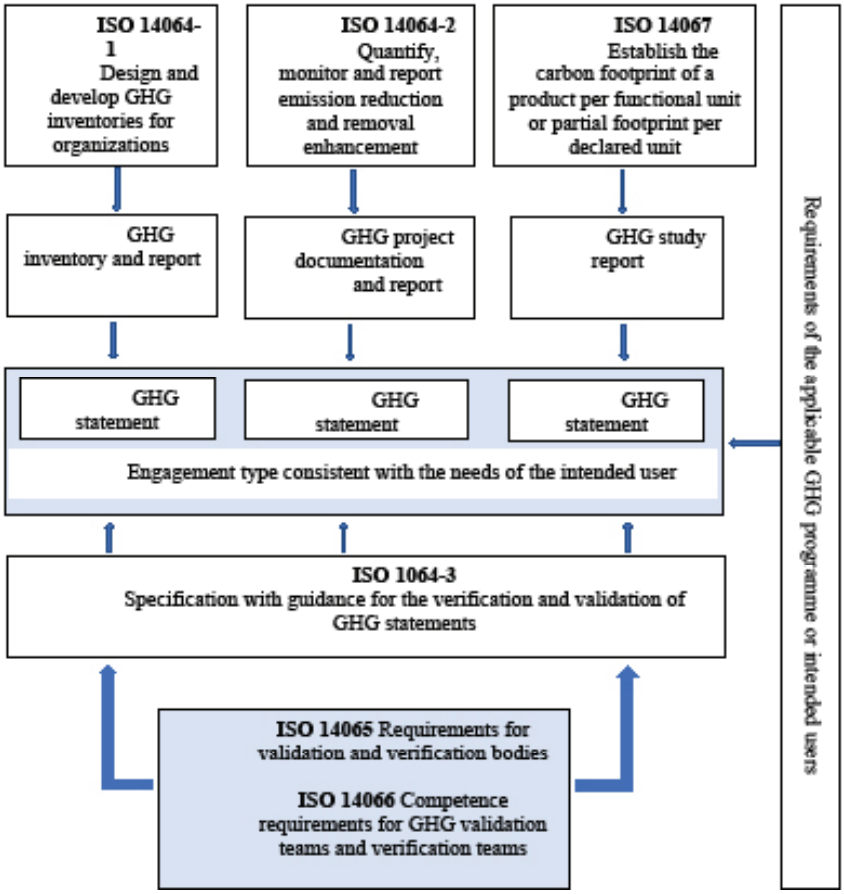
- ISO 14080:2018 "Greenhouse gas management and related activities – Framework and principles for methodologies on climate actions" provides guidance on a framework for developing new methodologies and on the use of existing methodologies for climate actions and their review, revision and management to meet stakeholder needs;

- ISO 50001:2018 "Energy management systems – requirements with guidance for use" specifies requirements for establishing, implementing, maintaining, and improving an energy management system. The intended outcome is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance and the energy management system.

In March 2006, ISO completed its four-year development of ISO 14064. This is a three-part international standard for GHG management activities, including the development of entity emission inventories. The development process included the involvement of over 175 experts from 45 countries. ISO 14064 provides governments, businesses, regions and organizations with a complementary set of programme tools to quantify, monitor, report and verify GHG emissions. It includes minimum requirements for GHG inventories and provides a basic structure for consistent and independent auditing. ISO 14064 offers policymakers a foundation of best practices to build a GHG reduction programme. The standard gives users opportunities for improved consistency and flexibility and discourages efforts to build voluntary GHG inventories.

As illustrated in figure 2, ISO 14064 comprises three parts. The first part (14064-1) specifies the requirements for developing organization- or entity-level GHG inventories. The second part (14064-2) details requirements for quantifying, monitoring, and reporting emission reductions from GHG projects. The third part (14064-3) sets out requirements and guidance for validation and verification of GHG data.

Figure 2: ISO standards relevant to GHG emissions



Source: International Organization for Standardization, 2018, 2019a, 2019b.

ISO 14064 certification can help an organization to improve its overall performance in terms of carbon reduction and enhance its data credibility. Organizations that obtain ISO 14064 certification clearly demonstrate their commitment to quality. ISO certification can help stakeholders (a) manage their carbon risk exposure and identify areas for improvement, (b) bolster their efficiency and reduce their energy consumption, and (c) reduce GHG emissions still further.

ISO 14064 is an international standard for quantifying and reporting GHG emissions. It is an important reference for organizations wishing to conduct a GHG inventory and provides a foundation for GHG reporting by government agencies and other entities.

2.3.3. Greenhouse Gas Protocol scopes and standards

Greenhouse Gas Protocol (GHGP) was established in 1998 by the World Resources Institute and the World Business Council for Sustainable Development. The organization provides standards, guidance, tools and training for businesses and governments to help them measure, report and manage climate-warming emissions (Greenhouse Gas Protocol, 2004).

Greenhouse Gas Protocol works closely with governments, industry associations, non-governmental organizations, businesses and other stakeholders to develop comprehensive global standards frameworks. Its standards has been developed for the private and public

sectors and can be applied to value chains, products, cities, and policies. Many companies and organizations have adopted the standards developed by Greenhouse Gas Protocol and a 2016 study found that 92 per cent of Fortune 500 companies made direct or indirect use of those standards.

Most notably, Greenhouse Gas Protocol has developed a framework for classifying emissions. Corporate emissions are grouped into three broad categories or scopes:

- Scope 1 (direct GHG emissions): direct emissions produced by sources owned or controlled by a company, including vehicles, boilers or furnaces owned by that company;

- Scope 2 (indirect GHG emissions resulting from electricity generation): emissions resulting from the generation of electricity that is consumed by equipment owned or controlled by a company;

- Scope 3 (other indirect GHG emissions): emissions that are not generated by sources owned by a company but are emitted as a consequence of the activities of that company. These include all indirect emissions that take place along the supply chain, and emissions resulting, inter alia, from the use of sold products and services, investments, leased assets, and outsourced activities.

Table 2: Scope of GHG emissions – three types

	Scope 1: **Direct GHG emissions**	**Scope 2:** **Indirect GHG emissions resulting from electricity generation**	**Scope 3:** **Other indirect GHG emissions**
Emission source	Equipment under the control of a company	The electrical power that a company buys	Indirect emissions not included in scope 2
Emission producers	Emitted by company-owned and operated facilities, vehicles, and other equipment	Emitted by power plants supplying electricity that is used by the company.	Emitted by the company's suppliers, business travel, the use of company products, etc.

Evaluating scope 3 emissions is challenging but is often a very rewarding task. For many businesses, scope 3 emissions account for more than 70 per cent of their carbon footprint. Measuring and managing scope 3 emissions is a laborious but necessary undertaking.

Greenhouse Gas Protocol initially required only the disclosure of scope 1 and 2 emissions, and provided little guidance on scope 3 emission measurement. In 2011, Greenhouse Gas Protocol (2011a) addressed that gap by issuing a supplement that defines minimum boundaries for the measurement of up- and downstream scope 3 emissions. However, the measurement and disclosure of scope 3 emissions is often undertaken in an unsystematic manner that impedes meaningful comparison, as the supplement has not been widely accepted and there is often no consensus at country level whether scope 3 emissions should be reported. France and the

United Kingdom, for example, introduced mandatory carbon reporting schemes in 2012 and 2013, respectively, but without scope 3 binding disclosure.

The Greenhouse Gas Protocol standards evolved out of the catastrophic rise in global temperatures caused by human activity. The standards aim to offer a much-needed data-driven approach to the global reduction of emissions. The standards allow organizations to identify significant value chain gaps and their most polluting activities. This knowledge allows businesses to focus on achieving the most meaningful reductions in emissions, not only within their operations, but also across global value chains.

The World Resources Institute and the World Business Council for Sustainable Development established Greenhouse Gas Protocol as part of a joint initiative to establish a comprehensive system for measuring GHG emissions. The organization has developed a framework that enables businesses and other stakeholders to measure, manage, report, and reduce emissions. That framework helps businesses and organizations understand the full impact of their activities across the whole value chain, including the impact of their upstream and downstream emissions.

Most operating registries have either adopted standards developed by the Greenhouse Gas Protocol or have created methodologies based in whole or in part on those standards, recommends using those standards, or state that their methods for measuring GHG emissions are consistent with those standards. Greenhouse Gas Protocol standards are based on the five guiding principles, namely relevance, completeness, consistency, transparency and accuracy.

For most industries in the United States of America and China, scope 3 emissions account for over 80 per cent of total emissions. They have also accounted for a growing share of global GHG emissions in recent decades. Although a number of studies have identified errors in scope 3 estimates, little quantitative analysis is undertaken and little is known about the type and size of errors. A study of large companies in the United States, for example, found that, on average, companies reported less than 25 per cent of their scope 3 emissions in 2013.

Greenhouse Gas Protocol provides seven standards for calculating and reporting on GHG emissions, including four standards for corporations:

- Corporate Accounting and Reporting Standard (revised edition) (Greenhouse Gas Protocol, 2004). This Standard facilitates the compilation of a corporate-level GHG emissions inventory. It provides instructions and recommendations for companies and other organizations and is meant to help them formulate an effective strategy to reduce GHG emissions and promote transparency and standardization.

- Global Protocol for Community-Scale Greenhouse Gas Inventories: an accounting and reporting standard for cities (version 1.1.) (Greenhouse Gas Protocol, 2006). This Standard sets out a comprehensive reporting and accounting framework for GHG emissions in cities. Cities are responsible for 75 per cent of global carbon emissions and provide significant opportunities for reducing carbon emissions and tackle climate change. The Standard allows for consistent and transparent measurements

of GHG emissions within cities and allows initial results to be scaled to national and international levels. The Standard also allows for benchmarking through the collation of comparable data and demonstrating the role of cities in reducing global emissions.

- Mitigation Goal Standard: an accounting and reporting standard for national and subnational greenhouse gas reduction goals (Greenhouse Gas Protocol, 2014a). This Standard provides instruction for setting national and subnational mitigation goals, and evaluating and reporting progress towards their achievement. The standard helps to follow up on GHG policies and outcomes and helps governments reach targets and report to international organizations.

- Corporate Value Chain (Scope 3) Accounting and Reporting Standard: Supplement to the GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2011a). This Standard provides guidance to companies wishing to assess GHG emissions and focus on emission reduction activities. The Standard helps companies consider external emissions rather than the direct emissions resulting from their operations. The Standard allows users to account for 15 different categories of scope 3 emissions.

- Policy and Action Standard: an accounting and reporting standard for estimating the greenhouse gas effects of policies and actions (Greenhouse Gas Protocol, 2014b). This Standard set out a standardized framework for evaluating the effectiveness of specific policies and actions. It helps governments assess where improvements are needed to achieve optimal results in terms of reducing GHG emissions. It deepens understanding among policymakers and decision makers of the impact of policies and actions on emissions and facilitates the development of more effective emission strategies.

- Product Life Cycle Accounting and Reporting Standard (Greenhouse Gas Protocol, 2011b). This Standard facilitates efforts by stakeholders to understand the full life cycle of a product, identify at which point in production most emissions take place, and identify potential strategies for reducing emissions. The Standard can help companies gain a competitive advantage by streamlining the production process, reducing costs and mitigating risks.

- GHG Protocol for Project Accounting (Greenhouse Gas Protocol, 2005) is a comprehensive accounting tool to help organizations quantify the projected benefits of climate mitigation efforts. It sets out concepts and methods for reporting GHG reductions. This Standard is meant for any entity seeking to quantify GHG reductions, including project developers, administrators, designers and initiators.

As shown in table 3, Greenhouse Gas Protocol has developed a step-by-step corporate accounting process to help companies and other organizations to identify, calculate, and report GHG emissions.

Table 3: Corporate accounting steps developed by Greenhouse Gas Protocol

GHG accounting steps	Chapter(s) of the Corporate Accounting and Reporting Standard (revised edition)
Stage 1. Get started: scope and plan inventory. Start by reviewing accounting standards and methods, determining organizational and operational boundaries, and choosing a base year: • Review GHG accounting standards and methods for organizational reporting; • Determine organizational and operational boundaries; • Choose a base year; • Consider third-party verification.	Chapters 1, 2, 3, 4, 5 and 10
Stage 2. Collect data and quantify GHG emissions: • Identify data requirements and preferred methods for data collection; • Develop data collection procedures, tools, and guidance materials; • Compile and review facility data (e.g., electricity, natural gas); • Estimate missing data to fill the gaps; • Choose emissions factors; • Calculate emissions.	Chapter 6
Stage 3. Develop a GHG inventory management plan to formalize data collection procedures: • Formalize data collection procedures and document process in inventory management plan.	Chapter 7
Stage 4. Set a GHG emission reduction target and track and report progress: • Finalize data; • Complete third-party verification (optional); • Report data as needed; • Prepare to set a publicly-reported GHG target and track progress.	Chapters 8, 9, 10 and 11

Good GHG management has become critical for organizations. Many multinationals include environmental performance criteria in their procurement process. After independent GHG verification, organizations can publish credible information about their carbon footprint, neutrality, and reductions. Organizations can compare themselves to their counterparts throughout the world in terms of GHG performance. Companies can leverage their exemplary GHG emission performance into market competitive advantage.

Greenhouse Gas Protocol provides services for both the public and private sectors. It has formulated standards that underpin many sustainability certifications and reporting systems. Most other standards, such as the Global Reporting Initiative and the International Integrated Reporting Council standard, are based on the work of Greenhouse Gas Protocol.

The Corporate Accounting and Reporting Standard was formulated for businesses developing their GHG inventory. It applies equally to other types of organization, including non-governmental organizations, governments and specialist agencies. Policymakers and architects of GHG programmes normally use the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard as a basis for their own accounting and reporting requirements.

2.3.4. ISO or Greenhouse Gas Protocol?

The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard is one of the oldest and most well-established standards for carbon reporting. In many ways, Greenhouse Gas Protocol has established an international "golden standard" for corporate GHG measurement and reporting. Many companies and organizations have adopted the standards developed by Greenhouse Gas Protocol and a 2016 study found that 92 per cent of Fortune 500 companies made direct or indirect use of those standards. Greenhouse Gas Protocol clearly defines the requirements for data collection, and for the structure and content of corporate GHG reports.

ISO 14064 is an international standard for corporate reporting of GHG emissions. It was published in 2006 and is fully compatible with other ISO standards. Based on the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard, ISO 14064 is an independent, voluntary greenhouse gas accounting standard and is deliberately policy neutral. ISO 14064 simply gives general guidance and direction. It is a minimal standard to follow, rather than a detailed guidance tool.

The ultimate goal of both ISO and Greenhouse Gas Protocol standards is to assess GHG emissions. A GHG report that complies with the relevant ISO standard will also meet Greenhouse Gas Protocol reporting standards. The main difference between the standards is verification of indirect energy emissions: ISO does not define scopes but rather adopts the principle of organizational and operational boundaries and counts direct and indirect emissions (without scopes). The Protocol for Project Accounting specifies tools and accounting methods of a GHG programme. In 2007, ISO, the World Resources Institute and the World Business Council for Sustainable Development decided to support both Greenhouse Gas Protocol standards and ISO 14064.

In general, the use of a Greenhouse Gas Protocol standard that is compatible with ISO family standards is recommended. In this way, companies can meet all their GHG reporting requirements. In addition, Greenhouse Gas Protocol standards enhance comparability between companies by providing greater detail on scope 3 emissions, thereby improving benchmarking and facilitating the development of targeted carbon reduction strategies.

3. Current rules, norms, regulations and practices relevant to efforts to limit GHG emissions in Congo Basin Climate Commission countries

Article 6 of the Paris Agreement is a central tool that parties invoked at the twenty-sixth session of the Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Glasgow in 2021, to foster compliance with their nationally determined contributions. The Paris Agreement envisages two mechanisms for achieving that objective:

a) Article 6.2 empowers parties to engage in voluntary "cooperative approaches". It enables them to use internationally transferred mitigation outcomes to meet their nationally determined contribution goals. The term "internationally transferred mitigation outcomes" is still not clearly defined. However, it is understood that those outcomes can be generated by any mitigation mechanism, procedure or protocol. Countries can, potentially, trade their "over achievement" of a mitigation target with another country, including in direct bilateral trade.

b) Article 6.4 creates a mechanism for parties to the Agreement to contribute to GHG mitigation efforts in other parties, with the emission reductions generated being used to meet the nationally determined contribution goals in either the host country or another party. Article 6.4 is sometimes viewed as the Paris Agreement successor to the clean development mechanism. The mechanism outlined in article 6.4 can be used by all parties to the Paris Agreement and operates according to principles very similar to those established in the clean development mechanism. Implementation of the new mechanism must result in real, measurable and long-term emission reductions. Activities must be added and verification and certification of outcomes performed by designated national operational entities. Efforts must, moreover, be made to avoid double counting of carbon credits.

Those two mechanisms are to be supported by a framework for non-market approaches, as envisaged in articles 6.8 and 6.9 of the Paris Agreement. Article 6 provides that lower abatement costs are to be realized through cooperation among parties. In that manner, the parties can create political incentives for more ambitious GHG reduction targets in the context of nationally determined contributions. There is, however, concern that article 6 mechanisms could incentivize countries to set less ambitious mitigation targets in order to sell or transfer mitigation outcomes that are not formally specified as part of their nationally determined contributions. In addition, concern has been expressed that acquiring countries may pursue less domestic mitigation, resulting in a "lock-in" of emissions-intensive technologies.

A significant achievement of the twenty-sixth session was the agreement among parties on modalities for preventing the double counting of carbon credits. Only the party that buys or holds a credit that it has generated can count that credit: this prevents two parties from both counting the same climate gains toward their Paris Agreement goals.

3.1 Summary of REDD+ process and funding mechanisms focusing on offset cycles and average market prices

3.1.1. REDD+ process

Carbon markets encompass a diverse set of market mechanisms that can be used to trade GHG emissions rights under different jurisdictions and management systems. Emission rights are called allowances or permits and entitle a purchaser to emit into the atmosphere a certain amount of CO_2 or its equivalent. Carbon credits, unlike carbon allowances, are generated by climatic projects and must be certified and registered. In many markets, carbon credits are used in lieu of allowances to comply with GHG reduction targets. The Kyoto Protocol provided for four key emissions mechanisms:

a) **International emissions trading:** This system was designed to facilitate the trade in GHG emission rights only between the industrialized countries listed in Annex B of the Kyoto Protocol. Those countries can sell and buy polluting rights to comply with their assigned pollution limits or caps. CO_2 is the main GHG and carbon is traded like any other commodity. The so-called "carbon market" was thus created.

b) **Clean development mechanism:** This project-based trading system opens markets to non-Annex I countries, which do not have legally binding targets. The mechanism encourages developing countries to design projects to reduce or capture emissions and create carbon credits. Carbon credits cannot be generated because of new domestic policy measures. The mechanism helps to attract and leverage new sources of both foreign and domestic investment to assist developing countries to green their industries and infrastructure. As an additional source of revenue, carbon credits can improve the viability of various projects, principally in the energy, waste, and infrastructure sectors. The clean development mechanism has also been successfully used by some countries to promote sustainable forestry and agricultural activities.

c) **Joint implementation:** This mechanism allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (an Annex I country) to earn emission reduction units from an emission reduction or emission removal project in another Annex I party, with each unit equivalent to one ton of CO_2. Those units can be counted towards countries' emissions targets under the Kyoto Protocol. All three Kyoto mechanisms allow industrialized countries to achieve their targets by purchasing carbon credits from outside their borders. However, only the clean development mechanism allows them to purchase credits from developing countries.

d) Voluntary carbon market: This mechanism is similar to the clean development and joint implementation mechanisms. The main difference is that credits are not uniformly issued or regulated by the United Nations. They are, moreover, typically sold in volumes that appeal to retail clients seeking a smaller number of reductions to offset their carbon footprints.

There are two main types of projects to address CO_2 emissions, namely projects to prevent emissions and projects to reduce or capture emissions.

Projects that prevent CO_2 emissions include: projects to promote the use of efficient stoves in developing countries, reducing the amount of firewood consumed or the use of biogas digesters, which use waste to generate electricity and heat; wind parks, which can generate electricity without emitting GHGs, and; projects to prevent emissions through compensatory mechanisms.

Projects that capture CO_2 from the atmosphere include tree plantations and protecting forests against illegal logging. Forests can absorb CO_2 from the atmosphere extremely efficiently compared with any other method or technology available. Furthermore, they contribute in many other positive ways. They protect against droughts, desertification, landslides and floods. Forests also supply fruit to the local population. Communities can use them to feed their families or to generate an income. Trees are home to many endangered species and are key to maintaining biodiversity. All those benefits are of huge value.

Land Use, Land-Use Change and Forestry projects can enhance efforts to capture GHGs. Those projects focus on strengthening natural carbon sinks. Trees are very efficient at sequestering carbon from the atmosphere. There are several different types of those projects, including the protection of existing forests, reforestation, namely the process of restoring forests on land that was once forested, and afforestation, namely the process of creating forests on land that was previously unforested, typically for longer than a generation. In addition, soil management projects attempt to preserve or increase the amount of carbon sequestered in soils.

All units traded on the carbon market equate to one metric ton of CO_2 equivalent emissions ($mtCO_2e$). Units are identified according to their eligibility for use under various compliance regimes:

- An allocated allowance U=unit is a unit required by Annex I countries to meet their Kyoto Protocol targets through international emissions trading;

- An emissions reduction unit is the credit generated under a joint implementation project, located in an Annex I country. Annex I and Annex B countries are the signatory countries to the Kyoto Protocol that are subject to caps on their GHG emissions and are committed to reduction targets (countries with developed economies). Annex I refers to the countries identified for reductions under UNFCCC, while the Annex B sets out an adjusted list of countries identified under the more recent Kyoto Protocol. Annex B countries have formally stated their reduction targets;

- A certified emission reduction is the credit generated under a clean development mechanism project located in a non-Annex I country;

- A verified emissions reduction is a project credit that is not certified for Kyoto compliance but verified according to the sales contract. Verified Emissions Reduction projects are implemented on a voluntary basis to meet corporate or individual greening goals independent of the Kyoto Protocol process;

- A removal unit is generated as a result of Land Use, Land-Use Change and Forestry projects activities;

In addition, there are units specific to national or regional schemes, including European Union allowance units, which are traded under the European Union Emissions Trading System. The terms carbon offset and carbon offset credit are used interchangeably, though they can mean slightly different things. A carbon offset broadly refers to a reduction in GHG emissions, or an increase in carbon storage (through land restoration or the planting of trees, for example). An offset is used to compensate for emissions that occur elsewhere. A carbon offset credit is a transferable instrument that is certified by a government or independent certification body to represent an emission reduction of one metric ton of CO_2 equivalent. Purchasers of offset credits can "retire" them in order to claim a reduction that can be used to achieve their GHG reduction goals.

Reducing emissions from deforestation and forest degradation in developing countries (REDD) is a prominent post-Kyoto mechanism. Participants at the eleventh session of the Conference of the Parties to the United Nations Framework Convention on Climate Change negotiated the mechanism as a mitigation measure against deforestation in natural forests.

Participants at the fourteenth session of Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Poznan, expanded the scope of REDD, which now includes preservation activities, namely conservation, sustainable management, and enhancing forest carbon stocks in developing countries. To reflect that change, a plus sign was added to the acronym. REDD+ creates a financial value for the carbon stored in forests by offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon pathways to sustainable development. Developing countries receive results-based payments for results-based actions.

United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD): This is a collaborative programme launched in 2008 by FAO, UNDP and UNEP that differs from REDD+. The latter is a voluntary climate change mitigation approach developed by the parties to UNFCCC, whereas UN-REDD was launched to support national REDD+ programmes and projects. UN-REDD promotes the informed and meaningful involvement of all stakeholders, including indigenous peoples and other forest-dependent communities, in national and international REDD+ implementation. Since its launch, UN REDD has steadily expanded and now has 65 offices around the world, including in Africa (28 offices), Asia and the Pacific (20 offices) and Latin America, and Caribbean (17 offices).

In addition to UN-REDD, a number of other important initiatives have emerged in support of the REDD+ mechanism and other carbon market processes, including the World Bank Forest Carbon Partnership Facility, the Norwegian International Climate and Forest Initiative, the Global Environmental Facility, the Australian International Forest Carbon Initiative, the Collaborative Partnership on Forests, and the Green Climate Fund.

The REDD+ mechanism is based on Greenhouse Gas Protocol principles, namely inclusiveness, transparency, accountability, consensus-based decisions and participation. The World Bank REDD+ model process includes three phases: (a) the readiness phase, (b) the reforms and investment phase, and (c) maintenance. The Forest Carbon Partnership Facility Readiness Fund channels grants to governments to complete the readiness phase. Countries were originally asked to determine reference scenarios and create REDD strategies through nationally-specific "readiness project idea notes". Countries were then required to elaborate more detailed strategies for implementing REDD at the national level through the development of "readiness plans". The World Bank subsequently abandoned the idea of developing those plans after participating developing countries called for the adoption of a simpler process with fewer criteria for approval. In response, the World Bank replaced the proposed readiness plans with what it dubbed "readiness preparation proposals".

UNFCCC secretariat bears overall responsibility for maintaining a global registry of carbon units. There are also various regulatory bodies at the national and regional levels to oversee and monitor carbon market transactions. A number of voluntary carbon markets have also established registries. Examples include the Verified Carbon Standard and the Gold Standard.

According to data provided by the UNFCCC secretariat, the clean development mechanism issued 70.9 million certified emission reductions (carbon credits) to developing countries hosting clean development mechanism activities in 2020. This is the highest number issued since 2013, and is equivalent to a 40 percent increase over 2019 figures. Countries also submitted numerous requests for the renewal of ongoing clean development mechanism activities. The voluntary cancellation of clean development mechanism carbon credits related to private companies' corporate social responsibility programmes also increased by 80 per cent compared with 2019 (United Nations Framework Convention on Climate Change, 2020).

Clean development mechanism certified emission reductions are generated via projects in developing countries. These projects earn one certified emission reduction unit for each metric ton of CO_2 equivalent ($mtCO_2e$) that they reduce or avoid. Certified emission reductions can then be bought by individuals and organizations to offset their own unavoidable emissions or as a contribution to global climate action. Offsetting can be thought of as crowdfunding for climate action: buying certified emission reductions is a direct financial contribution to the projects that allow stakeholders to reduce emissions and benefit surrounding communities.

The carbon offset accounting process should address the following: (a) baseline measurement: the process should establish a baseline and estimate the emissions that are likely to occur in the absence of a proposed project; (b) additionality, namely the offset credits that are unlikely to be generated without implementation of project activities. There are two common reasons why a project may lack additionality: (i) if it is intrinsically cost-effective due to energy cost savings, and (ii) if it must be implemented to comply with environmental laws or regulations.

(c) permanence, namely the irreversible benefit that is likely to be created once the project is completed. For example, trees may be harvested to burn the timber they contain and decrease the consumption of fossil fuel. If forests increase in terms of their size or density, then carbon is being sequestered. After reaching maturity, forests remove CO_2 more quickly than a recently replanted forest area. (d) leakage, namely when the project gives rise to higher emissions outside the project boundary, and (e) co-benefits, namely additional benefits stemming from a reduction in carbon emissions.

The European Union plays a very significant role in the global carbon market, and companies that emit GHGs are required to cut their emissions or buy pollution allowances or carbon credits under the European Union Emissions Trading System. The European Union, whose Member States have experienced volatile carbon prices due to fluctuations in energy prices and in supply and demand, will continue to dominate the global carbon market in the coming years, as the United States of America and China, the world's top polluters, have yet to establish mandatory emission-reduction mechanisms.

Carbon offsetting allows industrialized countries, companies, financial institutions and individuals to reduce their emissions through projects outside the "capped" area. Usually, those projects are seen as offering an alternative to more expensive emission reductions in stakeholders' own countries. The largest offset scheme is the clean development mechanism, which allows projects to be implemented in developing non-Annex I countries, which do not have emissions reduction targets under the Kyoto Protocol. The mechanism is overseen by the UNFCCC secretariat. Thousands of clean development mechanism projects are at various stages of development. Carbon savings are measured by calculating the extent to which the project in question will reduce GHG emissions, and credits generated through approved offset and mitigation schemes could generate more than $55 billion in the next few years.

Because of the high transaction costs and complexity of the clean development mechanism, opportunities for expanding its scope in Africa are limited. Therefore, attention has shifted to the voluntary carbon market. The voluntary market is not subject to the guidelines and rules of the clean development mechanism. Voluntary market projects are easier and cheaper to implement. However, they are often characterized by weak accountability mechanisms and may be prone to corruption. Joint implementation is another offsetting mechanism that allows Annex I countries to invest in projects in other Annex I countries that are classified as newly industrialized, including, for example, countries in Eastern Europe. Host countries are able to claim carbon credits for action in that regard.

Every clean development mechanism project must complete a number of steps before it can be registered and certified emission reductions can be issued. There are seven steps in the project cycle:

a) **Project design:** The first step is the preparation of a project design document by the project participant detailing the project, including the baseline, methodology and other relevant details;

b) **National Approval:** The second step is to secure a letter of approval from the designated national entity of the host party;

c) **Validation:** The project is independently evaluated by a designated operating entity to ensure it complies with clean development mechanisms standards;

d) **Registration:** Validated projects are submitted to the clean development mechanism executive board for formal approval;

e) **Monitoring:** The measurement of emissions is carried out by the project participant, in accordance with the approved methodology;

f) **Verification:** An independent review is conducted by the designated operating entity to ensure that the emission reductions claimed by the project participant were achieved;

g) **Issuance of a certified emissions reduction:** Following verification, the designated operating entity submits a verification report to the clean development mechanism executive board for the issuance of a certified emissions reduction.

3.1.2 Funding mechanisms

There are numerous funding mechanisms and entities that can support clean development mechanism and REDD+ projects in Congo Basin Climate Commission countries. These include the following:

UNFCCC loan scheme: The loan scheme has been developed to support clean development mechanism projects in least developed countries. Those projects help to reduce GHG emissions and promote sustainable development and technology transfer, benefitting the economies of developing countries. The scheme will provide interest-free loans for projects in least developed countries and in other countries with fewer than 10 registered clean development mechanism projects.

UNFCCC, UNEP DTU Partnership, and the United Nations Office for Project Services (UNOPS): These organizations provide loans to help countries draft project design documents, validation by a designated operational entity, registration of a project with the UNFCCC secretariat, and the monitoring and verification of certified emissions reductions.

UNFCCC regional collaboration centres: The UNFCCC secretariat has forged partnerships with regional development banks and other institutions to establish a number of regional collaboration centres in under-represented countries with a view to strengthening their participation in clean development mechanism projects. The first regional collaboration centre was established in January 2013 in Togo to increase participation in clean development mechanism projects in West and Francophone Africa. A second centre was established in Uganda to serve the needs of the rest of Africa. The centres focus on:

- Identifying opportunities for potential projects and programmes eligible under the clean development mechanism, and providing direct support for the design of mechanism projects and programmes by addressing technical and procedural issues in the project design and validation phase;

- Resolving problems identified by third-party validators;

- Identifying priority areas for the development of standardized baselines based on the emission profile of the country with a view to simplifying local clean development mechanism project processes;

- Identifying projects and programmes that would benefit from the establishment of standardized baselines and supporting the design of those projects and programmes;

- Providing institutional capacity development to a wide range of institutions, including universities, independent development organizations and governmental agencies.

World Bank Climate Change Fund Management Unit: An entity that formulates climate finance initiatives that deliver innovative and scalable climate and environmental action. With more than $5 billion in capital those initiatives:

- Create partnerships for the development of innovative financial instruments for low-carbon, climate-resilient development;

- Build supportive policy and regulatory environments to help lower the cost of capital and dismantle project barriers;

- Leverage private sector capital with a view to financing and scaling up climate action.

Funds are provided by the Unit on the basis of the results achieved. The Unit makes use of the following financial instruments to support emission reduction projects:

- The Forest Carbon Partnership Facility and the BioCarbon Fund Initiative for Sustainable Forest Landscapes, established to help countries prepare and implement REDD+ projects, including the use of REDD+ credits to support the development and implementation of sustainable land use activities;

- The Transformative Carbon Asset Facility, established to help policymakers shape environmental, energy and climate change policy to reach meaningful scale and make a lasting and transformative social impact;

- The Carbon Initiative for Development, which provides a portfolio of programmes that support emission reduction projects, most of which are small-scale and implemented at the household level. The Initiative has developed a standardized

crediting framework to support the crediting of emission reductions in the post-Kyoto era.

The Unit also runs climate change and environmental programmes administered through the World Bank in collaboration with the Green Climate Fund and the Pilot Program for Climate Resilience.

World Bank Carbon Finance Unit: An entity that has supported activities in 65 countries and has made $2 billion in emission reduction payments since the launch of the Prototype Carbon Fund in 1999. Key activities of the Unit include:

- The use of funds provided by governments and companies in Organisation for Economic Co-operation and Development (OECD) countries to purchase project-based GHG emission reductions in developing countries and economies in transition. Those emission reductions are purchased through one of the Unit's dedicated carbon funds on behalf of the contributor;

- The establishment in 2009 of the Carbon Partnership Facility as a partnership of buyers and sellers of carbon credits. The Facility, which manages funds totalling approximately $130 million, adopts scaled-up, programmatic approaches to support the emergence of low-carbon economies. The Facility brings together developed country buyers and developing country sellers of emission reductions in addition to donor country governments. The Facility promotes collaborative decision-making and provides opportunities for sharing expertise and lessons learned in the area of carbon finance. The Unit facilitates the development of emission reduction programmes and carbon assets across sectors and technologies, particularly in areas where governments must develop appropriate policy measures or leverage investments, including energy generation and distribution, transport and waste management.

Clean development mechanism programmes of activities: These provide a framework for the coordinated implementation of policies and measures for emission reductions. Once a programme of activities is registered, an unlimited number of component project activities can be added without restarting the complete clean development mechanism project cycle. Compared to regular clean development mechanism project activities, this programmatic approach has many benefits, particularly for less developed countries and regions.

African Development Bank: The Energy, Environment and Climate Change Department at the African Development Bank launched the African Carbon Support Programme, a two-year technical assistance programme, in November 2010 to help Bank clients in Member States to access carbon finance and ensure the commercial viability of their investments. The Programme evaluates the carbon finance potential of investment proposals received by the Bank and finances capacity-building activities for relevant host country government agencies.

African Carbon Asset Development Facility II: The African Carbon Asset Development Facility I was established in 2009 to address the concern that few clean development mechanism

projects were being implemented in Africa. The updated Facility, namely the African Carbon Asset Development Facility II, was launched as an innovative public-private partnership to promote the engagement of local project developers in African carbon markets. The Facility also seeks to raise awareness among African financial institutions of potential carbon market revenue streams.

Intra-ACP EU GCCA+ Programme: An initiative of the African, Caribbean and Pacific (ACP) Group of States, the European Union and the Global Climate Change Alliance, that supports efforts by vulnerable countries in Africa, the Caribbean and the Pacific to address climate change. With funding of €70 million, the Programme helps ACP Member States to develop and implement appropriate climate change adaptation and mitigation responses. The Climate Support Facility, the Programme's technical assistance component, provides demand-driven technical support.

Multinational African Biofuel and Renewable Energy Fund: This financial facility, established in 2011, provides support to initiatives in the areas of energy generation from renewable sources, biofuel production and flared gas reduction, afforestation and reforestation, waste and water management, and carbon emissions reduction.

Millennium Development Goal Carbon Facility: Developed by UNDP, this is an innovative mechanism for the development and commercialization of emission reduction projects. The Facility helps countries leverage the potentially significant benefits of carbon finance for the developing world.

Nairobi Framework: An initiative of six United Nations agencies, the Framework was adopted to strengthen the participation of developing countries, particularly in sub-Saharan Africa, in the clean development mechanism. The Framework has been strengthened through its cooperation with other international organizations whose goals and work plans support its targets. Those organizations include the International Emissions Trading Association, the Asian Development Bank, the Inter-American Development Bank and the Institute for Global Environmental Strategies.

Although there are several exchanges that facilitate the trade in carbon allowances and credits in real time, there is no central exchange and no single unitary carbon market price. Instead, prices are determined in different market segments as a function of supply and demand, as is the case with other traded commodities. A surrogate benchmark price for carbon is typically the price of a carbon allowance in the European Union Emissions Trading System, the world's largest carbon market by volume and monetary value. Carbon credits traded under the Kyoto Protocol clean development mechanism generally trade at a discount compared with the price of carbon allowances established by the European Union Emissions Trading System.

3.2 Carbon offset volumes and prices by project type, including voluntary market forestry, land use credit and renewable energy projects

The distribution of compliance and voluntary market offsetting projects, both globally and within Africa, remains uneven. According to Forest Trends, a non-profit organization founded in 1998, there were 3,328 offsetting projects worldwide as of 2022. Only 98 of those projects were in Africa, however (2.9 per cent of the total). As illustrated in table 4, the lion's share (72.7 per cent) of those projects were in North America, followed by Oceania (8.4 per cent), Asia (6.3 per cent), Latin America and the Caribbean (5.6 per cent), Europe (4.1 per cent) and Africa (2.9 per cent).

Table 4: Global carbon project offsetting activities

Global region	Projects	Percentage of total
Africa	98	2.9
Asia	209	6.3
Europe	137	4.1
Latin America and Caribbean	187	5.6
North America	2 417	72.7
Oceania	280	8.4
Total	3 328	100

Source: Forest Trends database, February 2022.

Not all Congo Basin Climate Commission countries host international carbon offsetting projects on their territories. Indeed, of the17 members of the Commission only 7 States have implemented those projects. As illustrated in table 5, these include Cameroon (5 projects), the Democratic Republic of the Congo (7 projects), Gabon (1 project), Kenya (11 projects), the United Republic of Tanzania (12 projects), Uganda (12 projects) and Zambia (3 projects).

Table 5: Carbon offsetting projects (active and in development) in Africa, including in Congo Basin Climate Commission member countries

State	Number of projects	Percentage of total
Congo Basin Climate Commission countries		
Cameroon	5	5.00
Democratic Republic of the Congo	7	7.14
Gabon	1	1.02
Kenya	11	11.22
United Republic of Tanzania	12	12.24
Uganda	12	12.24

Zambia	3	3.06
Congo Basin Climate Commission countries: total	51	52.00
Other African countries		
Burkina Faso	1	1.02
Ethiopia	3	3.06
Ghana	1	1.02
Guinea	1	1.02
Liberia	1	1.02
Madagascar	5	5.10
Malawi	4	4.08
Mali	1	1.02
Mauritius	1	1.02
Mozambique	5	5.10
Senegal	6	6.12
Sierra Leone	3	3.06
South Africa	12	12.24
Togo	2	2.04
Zimbabwe	1	1.02
Other African countries: total	47	48.00
African countries: total	98	100.00
Number of projects in Congo Basin Climate Commission countries compared with the total number of projects worldwide	24/3 328	1.56

Source: Forest Trends database, February 2022.

As illustrated in table 6, carbon-offsetting projects in Congo Basin Climate Commission countries are at different stages of development, are funded in a number of ways and make use of different mitigation mechanisms.

Table 6: Carbon offsetting projects in Congo Basin Climate Commission countries, including their status, interventions and mechanisms

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Cameroon						
Sustainable Agroforestry Ecosystem (SAFE) Project	n/a	1			1	1
Dja Biosphere Regional REDD+ Project	n/a	1			1	1
Community Payments for Ecosystem Services (PES): Noloenyeng Community Forest	n/a		1	1	1	1
Community Payments for Ecosystem Services (PES) in the Congo Basin: Nkolenyeng Community Forest	n/a			1		
Protection of Cameroon estuary mangroves through improved smoke houses, Mouanko, Littoral Region	n/a				1	1
Democratic Republic of the Congo						
Jatropha curcas cultivation in the Democratic Republic of the Congo, Masi-Manimba	1	1			1	1

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Mai Ndombe REDD+ Project	1		1	1		
Reforestation project using native species in the Maringa-Lopori-Wamba Landscape and establishment of the Bonobo Peace Forest	1	1			1	1
Ibi Batéké Sink Carbon Plantation Project	1	1			1	1
Kitshanga Reforestation Project	1	1			1	1
New Forests, New Stoves and Agroforestry, South Kivu	1	1			1	1
Ibi Batéké Forest	n/a	1			1	1
Gabon						
Gabon Fertilizer Company imperiled species/ habitats, Mandji Island	n/a		1		1	
Kenya						
International Small Group and Tree Planting Program (TIST), Meru	1	1			1	1
Vi Agroforestry, Endebess	n/a		1		1	1

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Forest Again (Kakamega Forest) project, Kakamega Forest National Reserve	1	1			1	1
Treeflights Kenya, Bore	n/a	1			1	1
Kasigau Corridor REDD+ Project, Taita Taveta	1		1	1	1	1
Aberdare Range/ Mt. Kenya Small Scale Reforestation Initiative/ Kamae-Kipipiri Small-scale afforestation/ reforestation project, Kinangop Constituency	1	1			1	1
Mikoko Pamoja project, Gazi Bay.	n/a	1			1	1
Farmer's Life East Africa project, Nyandarua.	n/a					
Upper Tana–Nairobi Water Fund project, Nairobi	n/a					
Imarisha Naivasha Water Stewardship Project, Naivasha	n/a					

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Lake Naivasha Basin Integrated Water Resources Action Plan (IWRAP) Project, Naivasha	1			1	1	
Uganda						
Uganda Nile Basin Reforestation Project No 4	1					
Natural High Forest Rehabilitation Project, Kibale National Park	1	1			1	1
Uganda Nile Basin Reforestation Project No 1	1	1			1	1
Uganda Nile Basin Reforestation Project No 2	1	1			1	1
Uganda Nile Basin Reforestation Project No 5	1	1			1	1
Degraded Lands project, Dokolo	1	1			1	1
Trees for Global Benefit	1	1			1	1
Uganda Nile Basin Reforestation Project No.3	1	1			1	1
Bukaleba Forest Project	1	1			1	1
Rwambu Watersheds project	n/a					

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Improved Community Livelihoods and Sustainable Water Management in the River Rwizi Catchment, Mbarara	n/a					
Rwenzori Mountains National Park Watersheds project, Bundibugyo	n/a					
United Republic of Tanzania						
Carbon Tanzania and Mpingo Conservation Development Initiative	n/a			1	1	1
Reforestation of grasslands in Uchindile, Kilombero and Mapanda, Mufindi	1	1			1	1
Hifadhi ya Misitu ya Asili ya jamii (HIMA) Community REDD+ project, Zanzibar	1		1	1	1	1
REDD+ Yaeda Valley Phase II, Karatu District	n/a		1	1	1	1
REDD+ Yeada Valley, Northern Tanzania	1		1	1	1	1

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Reforestation in the Idete Forest, Southern Highlands	1	1			1	1
Making REDD+ Work, Kilosa District	n/a		1	1	1	1
Kilimanjaro Water Stewardship Platform, Moshi	n/a					
Sustainable water use in the Usa River subcatchment, Moshi	n/a					
Sustainable water resources management in the upper Ruvuma River subcatchment, Songea	n/a		1	1	1	1
Positive Climate Change project	n/a				1	1
Mpingo Conservation and Development Initiative REDD+ project, Kilwa District	n/a		1			
Zambia						
Itawa Springs Protection Project, Ndola,	1					
Lusaka Water Security Initiative	n/a					

Congo Basin Climate Commission country/ project	Status	Intervention			Mechanism	
		Afforestation or reforestation	Avoided forest conversion	REDD+	Compensatory mitigation: permittee-responsible mitigation	Voluntary offsets and compensation (carbon, water, biodiversity)
Lower Zambezi REDD+ Project, Lower Zambezi National Park,	1	1			1	1
Total	24	24	10	11	36	35

Source: Forest Trends database, February 2022.

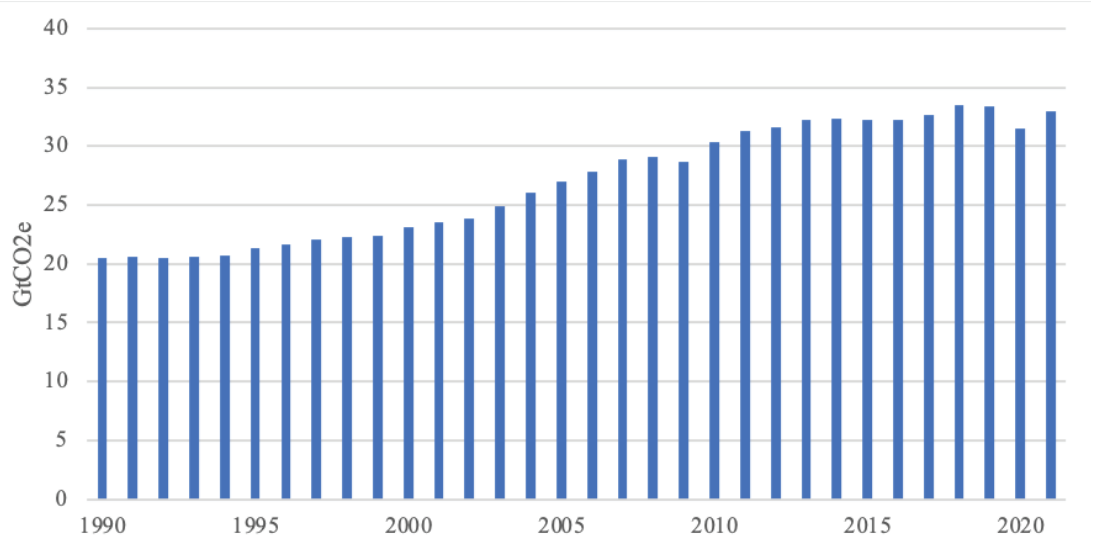
The projects listed above are described in greater detail in annex 1 to the present report. Of the 51 sample projects surveyed, only 24 projects are currently active, however. The other projects are in development or their status is unknown. The projects feature three types of intervention: (a) afforestation or reforestation, (b) avoided forest conversion, and (c) REDD+ interventions. Projects may combine two or more intervention types. Mechanisms for implementation include (a) compensatory mitigation, with permittee-responsible offsets and (b) Voluntary offsets and compensation (carbon, water, biodiversity). In permittee-responsible mitigation, all actions required to meet compensatory (offset) mitigation obligations are undertaken by the entities seeking a permit to impact a regulated natural resource or by an authorized agent or contractor working on their behalf. In those projects, the permittee retains full responsibility for meeting all of the terms of the permit they receive.

Table 7 sets out the project interventions and mechanisms in progress or planned in Congo Basin Climate Commission countries

Table 7: Project interventions and mechanisms in Congo Basin Climate Commission countries

Project interventions and mechanisms	Number
Interventions:	
• Afforestation or reforestation	24
Avoided forest conversion	10
• REDD+ projects	11
Mechanisms	
• Compensatory mitigation: permittee-responsible offsets	36
• Voluntary Offsets and compensation (carbon, water, biodiversity)	35

Figure 3: Upward march of global GHG emissions

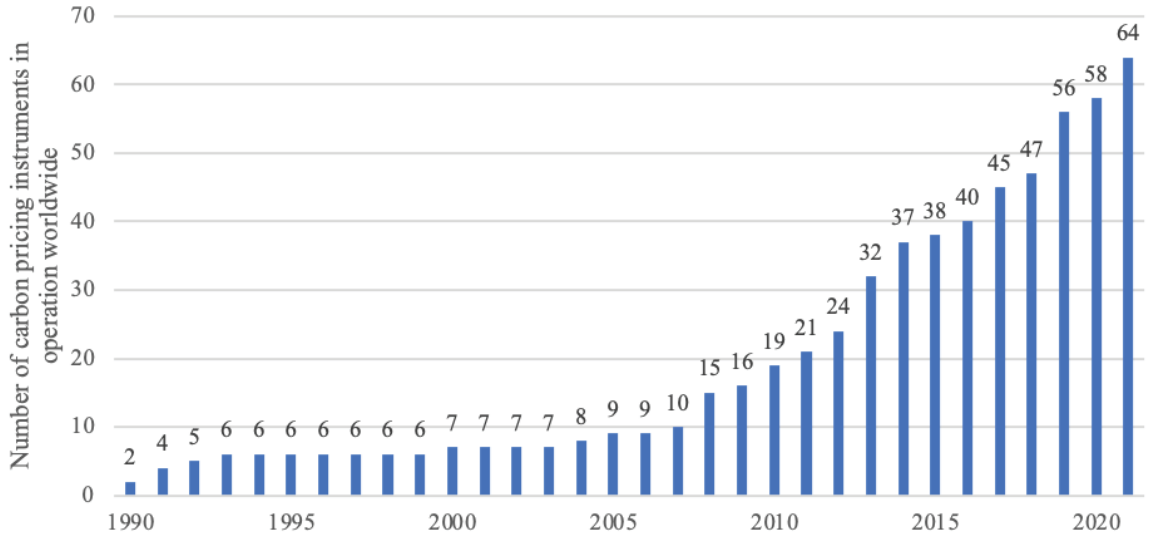


Source: Wolf, 2021.

As illustrated in figure 3, global GHG emissions continue to rise. That upward trend has been interrupted only on rare occasions, such as in the period following the 2008 financial crisis and during the recent coronavirus disease (COVID-19) pandemic. Those interruptions have proven only temporary, however, and emissions seem set to rise further.

According to a recent World Bank report (World Bank, 2021), and as illustrated in figure 4, a total of 64 carbon pricing instruments are now in operation around the globe, covering some 21.5 per cent of global GHG emissions. Those instruments generate some $53 billion in revenue, a 17 per cent increase in revenue compared with 2019. The full potential of carbon pricing remains largely untapped, however and, despite progress, current carbon-pricing efforts fall far short of what will be required if States are to meet their emissions targets under the Paris Agreement.

Figure 4: Share of global greenhouse gas emissions covered by carbon taxes and emissions trading schemes and the number of carbon pricing instruments in operation worldwide

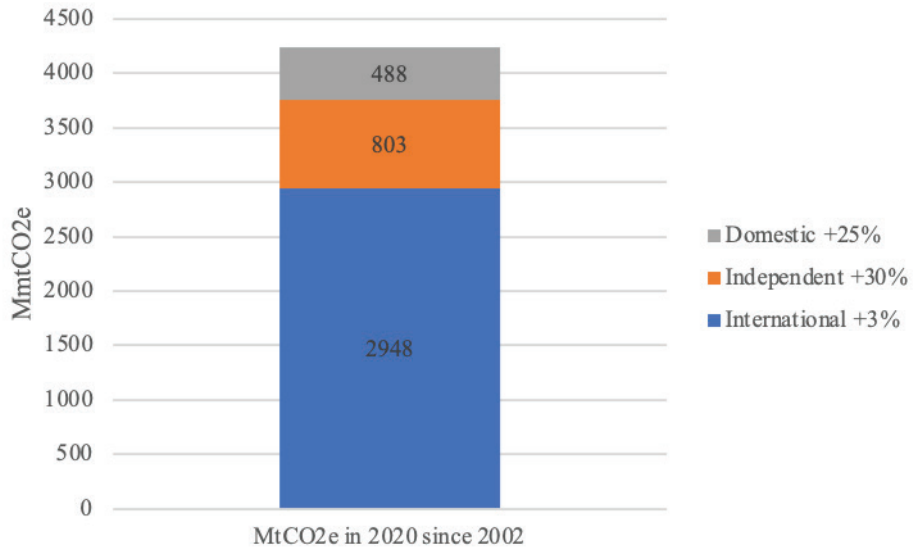


Source: World Bank, 2021.

Revenue growth is driven mainly by the rise in allowance prices under the European Union Emissions Trading System, which caps emissions and requires countries that exceed agreed GHG emission limits to purchase additional allowances. Global emissions trading systems have proven resilient during the COVID-19 pandemic and the associated decline in economic activity.

According to the World Bank, some three quarters of GHG emission credits are issued by international bodies, with the remainder issued by independent or domestic mechanisms, as illustrated in figure 5.

Figure 5: Cumulative issuance of carbon credits in million metric tons of carbon dioxide equivalent (MmtCO2e) 2019–2020 (and percentage increase in domestic, independent and international credits)

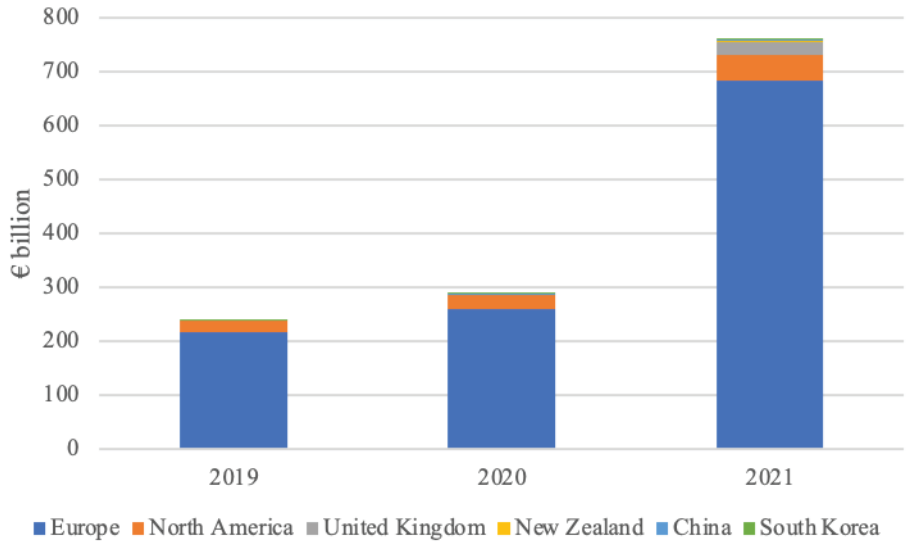


Source: World Bank, 2021.

In 2021, the cost of carbon permits soared by 140 per cent in the European Union. That trend has continued into 2022 on the back of the Union's ambitious climate agenda. Indeed, carbon prices have climbed a further 15 per cent, supported by developments in European energy markets and the rise in coal power generation.

A similar but less pronounced trend has been observed with mandatory carbon markets in other global regions. For example, the value of the North American carbon market, which includes the Western Climate Initiative and the Regional Greenhouse Gas Initiative, has increased by 89 per cent year on year and, according to a recent report by Refinitiv, a large private-sector provider of financial markets data and infrastructure, the total turnover of global carbon markets grew by 164 per cent in 2021 to €760 billion, equivalent to some $850 billion (Refinitiv, 2021). Those figures are illustrated in figure 6.

Figure 6: Size of global mandatory carbon markets (€ billion)

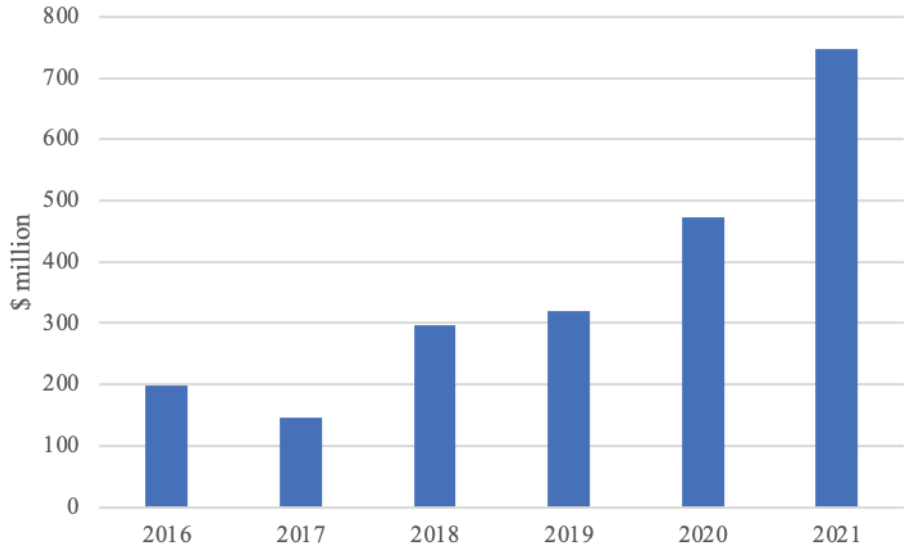


Source: Refinitiv, 2021.

While the European Union Emissions Trading System was certainly responsible for most of that growth, growth was also driven by the launch of national emissions trading schemes in the United Kingdom (after it withdrew from the European Union) and China, although the Chinese scheme is still less liquid than its European and North American counterparts.

The upward trend has also been seen in carbon markets in which carbon credits are purchased voluntarily. As illustrated in figure 7, the number of carbon credits purchased on voluntary carbon markets in 2021 to offset emissions (carbon offsets) rose by 58 per cent compared with 2020 figures.

Figure 7: Carbon offsets purchased on voluntary markets



Source: Ecosystem Marketplace, 2021.

Those totals include offsets reported by the American Carbon Registry, Architecture for REDD+ Transactions, Climate Action Reserve, the California Air Resources Board, the clean development mechanism, City Forest Credits, Climate Forward, Coalition for Rainforest Nations, EcoRegistry, Global Carbon Council, the Gold Standard, Plan Vivo, ProClima, and the Verified Carbon Standard.

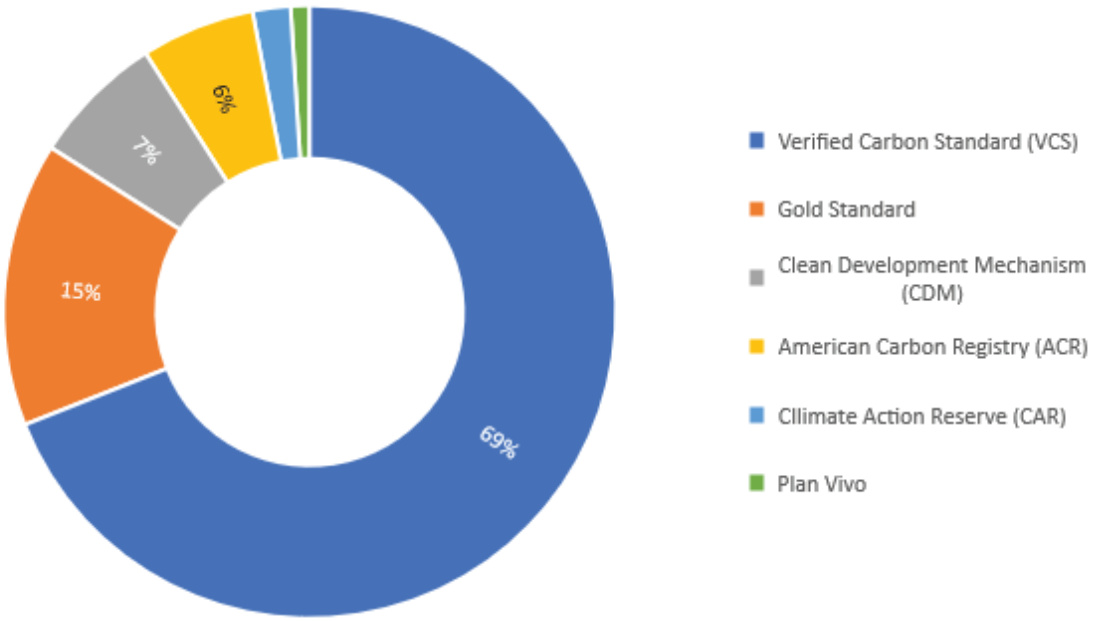
The voluntary carbon market value is likely to expand further and is expected to be worth some $100 billion by 2030 and some $550 billion by mid-century as more companies strive to become carbon-neutral and uphold their climate-related commitments.

3.3 Financial transactions occurring between primary and secondary markets

Carbon credits are traded both on compliance (compulsory or mandatory) and voluntary markets. Both markets can be further divided into primary and secondary markets. A primary carbon market transaction refers to the first sale of carbon credits from the project owner to the buyer. The secondary carbon market occurs when a secondary seller sells guaranteed carbon credits to another purchaser in the secondary market. Those include primary project developers providing project-specific guarantees.

As illustrated in figure 8, a number of established carbon trading mechanisms are used to facilitate climate projects in a wide range of fields, including agriculture and carbon capture and storage.

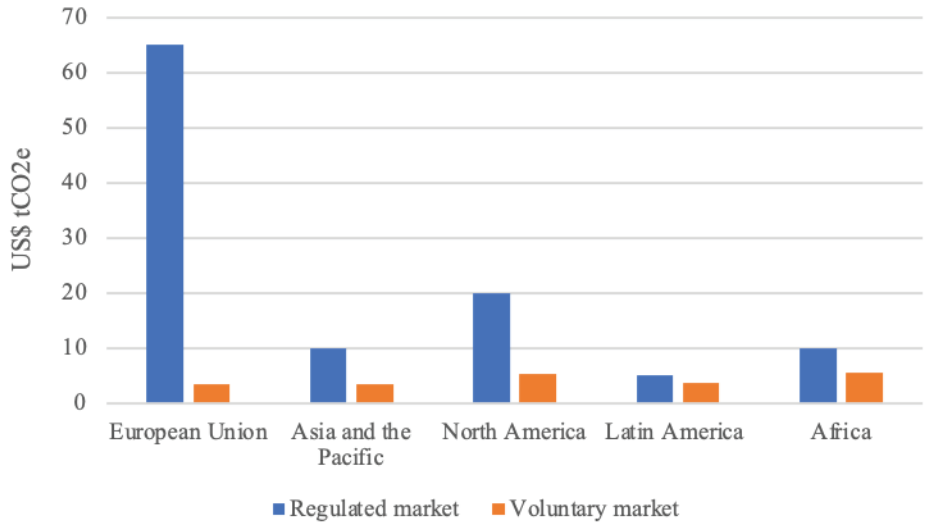
Figure 8: International trade on primary carbon markets by trading mechanism (2020)



Source: Ecosystem Marketplace, 2021.

A major obstacle to investment in climate projects is the fact that prices on voluntary carbon markets are typically much lower than those in regulated markets. At present, and as illustrated in figure 9, global prices are approximately $3.40/mtCO$_2$e on voluntary markets, while the price currently stands at some €65.00/mtCO$_2$e in the European Union Emissions Trading System.

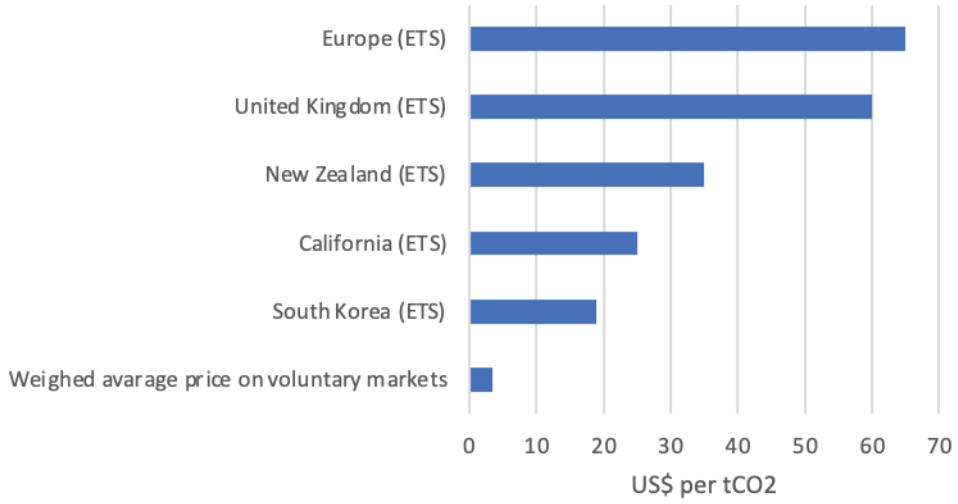
Figure 9: Regulated and voluntary carbon market prices (per mtCO2e)



Source: Ecosystem Marketplace, 2021.

Investors are generally wary of spending money on climate projects, as the average price of carbon offsets on voluntary markets is still much lower than on mandatory markets. This is illustrated in figure 10. The overall trend is clear, however: over last year, the average price of a carbon unit, expressed as a ton of CO_2 equivalent, rose from $2.50 to $3.50, while by mid-century prices are expected to range between $50.00 and $120.00 (Ross-Thomas and Rathi, 2021). This has prompted a number of multinational corporations to launch their own climate projects to achieve their corporate agendas and diversify their revenue streams.

Figure 10: Average weighed carbon credit price on compliance (emissions trading system (ETS)) and voluntary markets in mid-2021



Source: Ecosystem Marketplace, 2021.

While the voluntary carbon market was worth almost $1 billion in 2021, its total value had been estimated at only $300 million in 2018. Furthermore, the voluntary market could be worth as much as $100 billion by the end of the current decade.

3.4 Drivers of carbon credit price volatility in Congo Basin Climate Commission countries

There are numerous global drivers of carbon credit price volatility. The following drivers are particularly relevant to Congo Basin Climate Commission countries:

International environmental policies are the main driver of carbon compliance and voluntary market prices. Both the UNFCCC agenda and global environmental policies are changing rapidly and result in significant price volatility. The more rigid an environmental agenda is, the higher carbon market prices tend to be. Recent steps to align the European Union Emissions Trading System with the Union's 2030 climate target of a 55 per cent emissions reduction compared with 1990 levels has led to a significant rise in carbon market prices; potential changes announced in July 2021 include a one-time cap recalculation and a tighter reduction factor.

The global economy is the second most powerful driver in global, national, and local markets. Economic fluctuations and expectations drive market responses. The economic crisis in 2008 led to a fall in industrial emissions in Europe of 11 per cent in 2009, which put emissions below the caps set by the European Union Emissions Trading System. Fears that Emissions Trading System caps were too generous proved real as they resulted in an overall surplus of allowances of 62 million tons of CO_2. This benefited heavy industry, which found itself with emissions permits that were some 30 per cent greater than those required. At the same time the power generation sector experienced shortages. Surplus permits could be banked indefinitely and set against future targets or sold at a profit. Thus, heavy industry lost any incentive to invest in clean technologies and reduce their emissions by other means. The International Energy Agency and current market analysis indicate that carbon prices should be doubled from current levels in order to meet UNFCCC goals and stimulate the adoption of greener technologies and investments in natural capital.

The COVID-19 pandemic. In 2020, the economic implications of the pandemic were largely depressive. In 2021, the impact was more mixed as countries took different approaches to lockdown measures and the emergence of new COVID-19 variants exacerbated volatility. The main impact was on air traffic. Industrial demand was affected little by pandemic-related travel restrictions. Some partial lockdowns even contributed to higher residential demand.

High natural gas prices. Record high gas prices, driven by cold weather and low gas storage volumes, drove populations to reduce their gas consumption in the second half of 2021. Natural gas prices rose to some 200 euros per metric ton. This led to increased demand for European Union Allowances as the consumption of coal increased.

High emissions. European power sector emissions in 2021 are likely to have increased for the first time since 2010, fuelled by increased coal-based power generation and economic recovery. In fact, according to Bloomberg News, thermal generation emissions in France, Germany, Italy and the United Kingdom may have been as much as 14 per cent higher in 2021 than in 2020.

The increasing interest of speculators and traders has led to recent increases in carbon prices in the European Union, with both institutional and retail investors piling into the market. There are now more than 880 entities invested in European Union Allowance futures markets, markets that are not regulated by the Union, with a 64 per cent increase in the number of entities occurring in the last year alone. The total value of carbon exchange-traded products, popular among retail investors, now exceeds $2 billion.

Ongoing coal-fired power plant closures continue to suppress European Union Allowance prices. The European Union now generates a third less power from fossil fuels than it did 10 years ago. Much of that decline has occurred since 2017 as carbon prices have surged. Both mandatory and voluntary coal mine closures decrease hedging requirements and thus demand for European Union Allowances.

Industrial demand. The initial recovery of industrial production in Europe following the COVID-19 pandemic lost momentum in early 2022. Supply chain constraints continue to create bottlenecks while high energy prices continue to increase production costs.

Total number of allowances in circulation. As a result of reduced GHG emissions, the number of European Union Allowances in circulation increased from 1,385 million metric tons in 2019 to 1,579 million metric tons in 2020. The increase in the number of Allowances in circulation and decreasing demand could result in lower Allowance prices.

International standards affect carbon pricing. The Gold Standard and the Verified Carbon Standard cover some 85 per cent of the carbon voluntary market, while the remainder is covered by other mechanisms, including the clean development mechanism, the American Carbon Registry, Climate Action Reserve, and Plan Vivo. National and subregional carbon mechanisms are developing rapidly and by the end of 2020, they accounted for some12 per cent of all carbon credits issued on voluntary markets. A total of 24 localized compensation mechanisms are in operation worldwide, and 6 more are in the process of development. Standards are evolving and affect market prices over time.

Transaction size. Data show that prices of carbon offsets are often influenced by the size of transactions, with larger volume deals typically creating economies of scale and garnering a discounted price per ton. The weighted average price per ton for transactions of less than 10,000 $mtCO_2e$ was close to $7 per ton in 2021, whereas 100,000+ ton deals averaged $2.68 per ton in 2020 and $3.59 per ton in 2021 year. That volume-pricing dynamic is important to keep in mind when evaluating price comparisons.

Spot and forward transactions. The volume of spot and forward transactions is highly variable year to year. It is clear, however, that the spot market is much more commonly used than the forward market. Spot volumes were almost six times larger than forward volumes in 2021. Meanwhile, the price difference between spot and forward transactions within years varied negligibly, with a $0.51 difference in 2021. This may be unsurprising, given that project attributes are generally the same and forward markets are typically priced against spot markets. For the latter, the credits are just delivered at a later time.

3.5 Project practices and success stories, including in the areas of avoided deforestation, afforestation/reforestation, improved forest management and sustainable agriculture

As mentioned previously, 98 carbon offsetting projects from Africa were accessed and subjected to the analysis. Over half of those projects (51 projects) are in the 17 Congo Basin Climate Commission countries, but only in 7 of those States, namely Cameroon (5 projects), Democratic Republic of the Congo (7 projects), Gabon (1 project), Kenya (11 projects), United Republic of Tanzania (12 projects), Uganda (12 projects) and Zambia (3 projects). Of the 51 projects, only 24 projects are currently active, however. The other projects are in development or their current status is unknown. The projects feature three types of intervention: (a) afforestation or reforestation, (b) avoided forest conversion, and (c) REDD+ interventions. Projects may combine two or more intervention types. Mechanisms for implementation include (a) compensatory mitigation, and (b) voluntary offsets and compensation. All those projects are designed in line with relevant international standards and provide benefits for the environment and rural communities. The locations of the 51 carbon offsetting projects in the 17 Congo Basin Climate Commission countries are shown in table 8.

An overview of a number of exemplary projects underway in the 17 Congo Basin Climate Commission countries is provided in annex 1 to the present report.

Table 8: Carbon offsetting projects in Congo Basin Climate Commission countries

Congo Basin Climate Commission country	Number of carbon-offsetting projects
Angola	
Burundi	
Cameroon	5
Central African Republic	
Chad	
Congo	
Democratic Republic of the Congo	7
Gabon	1
Equatorial Guinea	
Kenya	11
Rwanda	
Sao Tome and Principe	
South Sudan	
United Republic of Tanzania	12
Uganda	12
Zambia	3
Morocco (associate member country)	
Total	51

4. Greenhouse gas protocols for four selected sectors

4.1 A standardized and harmonized protocol that adopts conventional greenhouse gas emission management approaches

The proposed standardized and harmonized GHG protocol is set out in annex 2 to the present report. It has been modelled on the GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2004) and takes into account the particular needs of Congo Basin Climate Commission countries. It incorporates the experience and knowledge of more than 350 experts drawn from businesses, non-governmental organizations, governments, and accounting associations. It has been road tested by over 30 companies in 9 countries.

4.2 Standardized and harmonized protocols that adopt conventional greenhouse gas emission management approaches covering four selected sectors

Four supplemental sectoral outlooks have also been developed, in consultation with experts at ECA and representatives of Congo Basin Climate Commission countries, to facilitate carbon project development. Those sectors are: (a) improved forest management (annex 2a); (b) energy efficiency/cleaner cookers/efficient cookstoves (annex 2b); (c) agricultural soil enrichment (annex 2c); and (d) rice cultivation (Annex 2d).

4.3 Draft reporting template

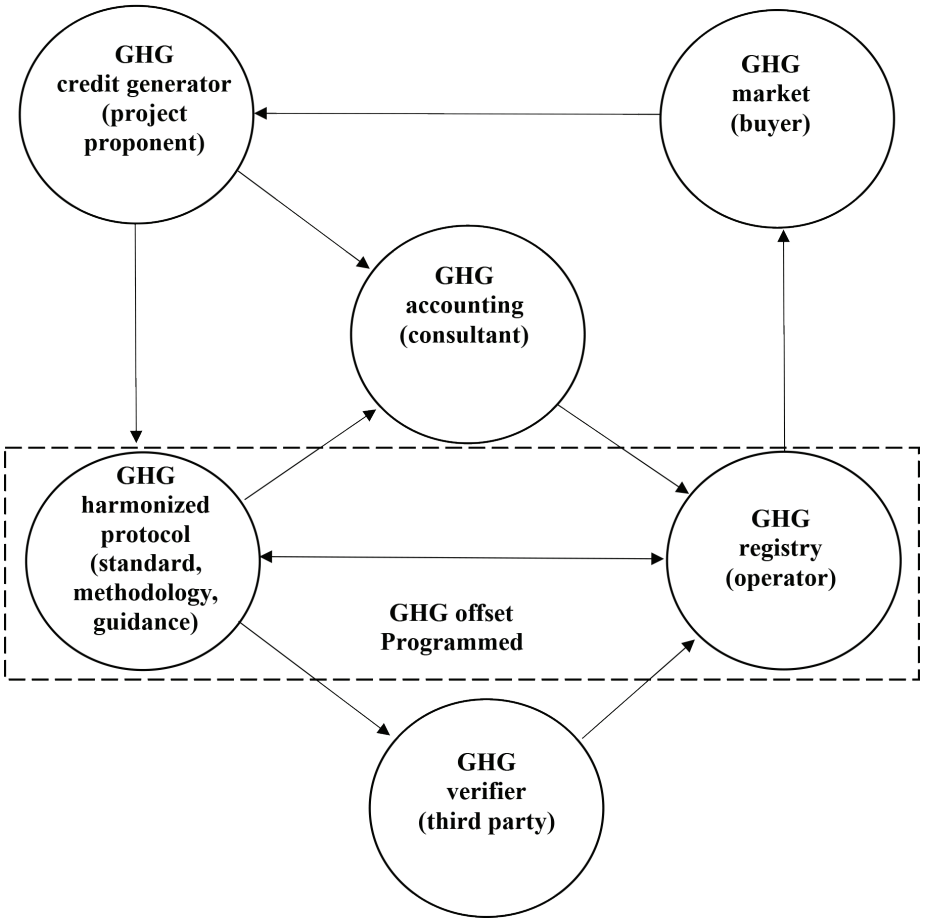
Annex 3 sets out a reporting template to compliment the proposed standardized and harmonized greenhouse gas protocol. It facilitates the collection and presentation of results of the GHG accounting process and was developed for use by all African countries, including members of the Congo Basin Climate Commission.

5. Recommendations on the use of the proposed standardized and harmonized greenhouse gas protocol and draft reporting template

5.1 Mutual recognition of the protocol

Promoting an efficient carbon market in the Congo Basin Climate Commission subregion will require concerted action by the secretariat of the Congo Basin Climate Commission and its member countries. Critical steps include the mutual recognition of the protocol, the establishment of a single GHG offset registry, GHG institutional capacity-building and increased access to green investment capital. Those steps will help boost the green and blue economies in the Congo basin, and foster socioeconomic and environmental progress. The offsetting mechanisms relevant to the proposed protocol are set out in figure 11.

Figure 11: Greenhouse gas offsetting mechanisms



The GHG credit generator is an individual or corporate entity that creates and owns carbon project credits. Those credits can be generated by a wide range of projects, including projects in the areas of forestry, agriculture, power generation or domestic emission reductions. The project proponent is the individual who creates and submits a GHG project offsetting proposal for the issuance and sale of credits. The project owner, project manager and project proponent can be one person or a party, or they can be different individuals or parties. A project owner may contract a consultant to design and submit the project proposal. The project owner can also hire a manager to implement the project. The project owner, proponent and manager share income from the sold credits, in accordance with the arrangements set out in the relevant contract.

The proposed GHG protocol includes standards, methodology and guidance documents. The protocol provides guidance and specifications on monitoring and reporting on GHG projects. Stand-alone protocols do not necessarily have associated regulatory bodies that register carbon projects. Nor do they normally establish a special registration and enforcement system to ensure legal ownership and track offset credits. In other words, the GHG protocol does not have a registration and enforcement system. Using a stand-alone GHG protocol is necessary, but not sufficient to guarantee the quality of offset credits.

The GHG offset registry is designed to track relevant carbon offset projects, including their status, credits generated, project ownership, sales, boundaries and retirement. The registry itself cannot check the quality of credits issued but must be used by an independent third-party verifier to ensure that credit quality reflects the GHG protocol methodology. After the credits are verified, they can be sold in compliance or voluntary over-the-counter markets. The GHG offset registry and the standardized GHG protocol together form a GHG offset programme.

There are three core objectives of a carbon offset programme:

- Providing eligibility, definitions and rules for the GHG project design and implementation. This can include additionality and baseline methodologies, definitions of accepted project types, and procedures for validating project activities;

- Monitoring, reporting, verification, and certification rules to ensure that offset projects perform as they were designed. Certification rules are used to confirm the actual GHG reductions that can enter the market once the project is implemented;

- Registration and enforcement systems should clarify ownership, facilitate the trading of credits, track credit retirement, and ensure that credits are not double counted through their sale to multiple buyers. Those systems must include a registry with publicly-available information to uniquely identify offset projects and a system to transparently track ownership and transfers of credits.

Consultants, wholesalers, retailers, brokers, aggregators and other intermediaries are also involved in the carbon market mechanism.

GHG programmes are created and managed by organizations with the capacity to provide carbon credit quality assurance guarantees. Those organizations include large international bodies and independent non-governmental organizations. Initially, governmental bodies certified offset credits only for regulatory purposes. Table 9 set out a number of compliance and voluntary carbon offset programmes currently in use in Congo Basin Climate Commission member countries.

Table 9: Compliance and voluntary carbon offset programmes in use in Congo Basin Climate Commission member countries

Compliance or voluntary carbon offset programme	Coverage	Labels
Compliance carbon offset programmes run by governmental bodies:		
Clean development mechanism	Developing countries	Certified emission reduction
Joint implementation	Developing countries	Emission reduction unit
Voluntary carbon offset programmes run by non-governmental organizations		
Gold Standard	International	Verified emission reduction
Plan Vivo	International	Plan Vivo certificate
Verified Carbon Standard	International	Verified carbon unit

Each of the protocols use similar but different methodologies for measuring and verifying emissions reductions. Buyers striving to meet their corporate climate commitments are showing increasing interest in voluntary carbon offset programmes, which have grown significantly in the last decade. However, buyers continue to struggle to find high-quality carbon credits at transparent and reliable prices. Meantime the development of a wide range of protocols and programmes has resulted in market fragmentation, low liquidity and limited transparency.

There are more than 50 GHG offsetting projects currently in operation or planned in Congo Basin Climate Commission Member States. They all use different protocols, methodologies, and guidance from different stakeholders in different carbon markets.

At present, the carbon market in Congo basin lacks the necessary liquidity for efficient trading to take place. Carbon credits are heterogeneous. Each credit has specific attributes associated, inter alia, with a particular GHG project type, protocol or programme. Discrepancies affect prices and deter potential buyers and investors. Inconsistencies among credits mean that market infrastructure is both expensive and inefficient.

Market infrastructure would be more efficient if all credits were issued under a common coordinated system based on mutually recognized GHG protocols. Using a standardized and harmonized GHG protocol for different offset programmes would ensure their mutual recognition by Congo Basin Climate Commission Member States. The task of securing mutual recognition of protocols could be successfully promoted under the auspices of the secretariat of the Congo Basin Climate Commission.

5.2 The development of shared carbon market infrastructure that provides for a common registry of offsets, communication among registries and the avoidance of double counting

A GHG registry is a database for collecting, verifying, tracking, and certifying emissions from emitters. Different types of registries may be used by a wide range of stakeholders to collect critical information for policymakers. A GHG registry is a "bottom-up" database that can be used to facilitate the certification of emissions reductions by GHG emitters. A registry is different from a national inventory, which tracks data in a "top-down" manner. A national inventory is broader, but less accurate and less useful for policymaking. A national inventory is, however, essential for navigating and assessing sectoral and aggregate emissions trends. Inventories cannot associate emissions with individual facilities. In contrast, GHG registries collect information about individual facilities and corporate emissions on the spot and data may therefore be associated with a specific location.

Registries can serve both mandatory and voluntary markets. Voluntary market registries process data from businesses and other facilities that need to certify emission reductions and sell their respective carbon credits. Mandatory market registries are mostly compiled for regulatory purposes and ensuring compliance with regulatory mechanisms, particularly at the corporative level.

There are several registries operational in Africa and particularly in Congo Basin Climate Commission countries. Those registries have been established by governments or by intergovernmental non-profit and private sector stakeholders:

- American Carbon Registry
- APX Inc., which administers the following offset registries:
    - Gold Standard Registry
    - Climate Action Reserve
- Markit, which administers the following offset registries:
    - Social Carbon Registry
    - Plan Vivo Registry
- Verra, which administers the following offset registries:
    - Verified Carbon Standard Registry.
    - Climate, Community and Biodiversity Standards Registry.

Table 10 shows the global market shares of key voluntary market registries

Table 10: Global market share of key voluntary offset registries

Voluntary offset registry	Market share (percentage)
Verified Carbon Standard	59
Gold Standard	17
Clean development mechanism	8
American Carbon Registry	3
Others	5

Registry enforcement systems should ensure that contracts clearly identify who owns emissions reductions and who bears the risk of the project failure. GHG offset registries track GHG projects and issue carbon credits for each metric ton of certified CO_2 equivalent ($mtCO_2e$). A registry is a vital tool for creating a credible and fungible offset commodity. A registry assigns a serial number to each certified credit and keeps its credit history. After the credit is sold, its serial number is transferred from the account of the seller to an account of the buyer. When the buyer utilizes the credit and claims an offset against their own emissions, the registry retires the serial number. Thereafter the credit cannot be physically sold. In this way the registry eliminates the risk of double counting, whereby another stakeholder could take credit for the same offset. A registration and enforcement system should, at a minimum, incorporate the following elements:

- A registry with publicly available information to uniquely identify offset projects;
- Serial numbers for each offset credit generated by each project;
- A system to transparently track ownership of offsets, making it possible to trace each credit back to the project from which it originated;
- A system for ascertaining the status of an offset credit, including whether or not a particular credit has been retired;
- Contractual or legal standards that clearly identify the original "owner" of an offset credit;
- Contractual or legal standards that stipulate who is financially responsible should the project fail or partially fail, including who is responsible for replacing credits associated with the failed project;
- Independent third-party verification;
- Public reporting while respecting business confidentiality.

Following the mutual recognition of the proposed standardized and harmonized GHG protocol among Congo Basin Climate Commission member countries, the second logical step is to develop a common registry system for offsets in the Congo basin. The secretariat of the Congo Basin Climate Commission may need to initiate and lead that process. The formulation of a standardized and harmonized GHG protocol and the development of a common registry of offsets would help to harmonize the GHG offset market in the subregion and allow relevant stakeholders to compare member country registries. That would certainly boost green and blue economic development in the subregion.

The carbon offset programme, when established, may adopt a number of approaches to prevent double counting, including by:

- Ensuring that offset credits are only issued after the approval of emission reduction verification reports and other supporting documentation;

- Checking that the accounting boundaries used to quantify GHG reductions for different projects do not overlap;

- Monitoring project registrations, including those of other programmes, to ensure that a project does not generate credits for the same emission reductions in more than one programme;

- Operating a robust registry system that assigns a unique serial number to each individual credit, tracks its transfer and ownership, and records that carbon credit's use and retirement;

- Restricting the eligibility of project types and excluding projects that are known to be subject to GHG reduction mandates or competing claims;

- Requiring project developers to sign legal attestations asserting their exclusive claim to the credited emission reductions, and undertaking to communicate those claims to the buyers of offset credits.

Leadership by the secretariat of the Congo Basin Climate Commission would facilitate the expansion of carbon markets in the region and could lead to an increase in the price of carbon credits. The secretariat of the Congo Basin Climate Commission therefore has a unique opportunity to become an environmental leader, both within the Congo basin subregion and throughout Africa.

5.3 Enhancing mitigation ambition through case-by-case reviews and negotiations and by building on lessons learned in the implementation of international agreements

Mitigation ambition is a key working concept of the Paris Agreement. The Agreement, which entered into force in November 2016, was adopted with a view to limiting global warming to well below 2°C, and preferably to below 1.5°C, compared to pre-industrial global temperatures. To achieve that goal, countries were urged to ensure that global GHG emissions start to decline by mid-century. A landmark instrument to help States advance the international climate agenda, the Paris Agreement has facilitated the collective efforts by the global community to address challenges posed by climate change.

The Paris Agreement, which calls for economic and social transformation using cutting edge science and technology, provides for action to be taken in a series of increasingly ambitious five-year periods. By the end of each period, countries should submit plans for further emissions reductions. Those plans are known as countries' nationally determined contributions. The Paris Agreement also requires countries to formulate and submit long-term low GHG emission development strategies. Unlike countries' nationally determined contributions, those strategies are not mandatory, but instead provide a vision and direction for the achievement of more ambitious carbon targets.

Under the Paris Agreement, countries have established enhanced transparency frameworks to report on actions and progress in climate change mitigation, adaptation and support provided or received. The information gathered through those frameworks informs the global stocktake of the Paris Agreement, through which the international community can assess its collective progress towards its long-term climate goals. To minimize carbon leakage, the Paris Agreement climate ambitions were formulated in the light of lessons learned by the World Trade Organization and in the context of the operationalization of the Warsaw Framework for REDD-plus.

5.4 Institutional capacity-building

Under the terms of the Paris Agreement, developed countries are committed to providing financial resources to developing countries. Beyond general climate finance commitments (set out in article 9 of the Agreement), the Paris Agreement also determines that support shall be provided to developing countries for the purpose of anthropogenic emissions reporting (article 13), nationally determined contribution implementation reporting (articles 4 and 13), and for the "timely and accurate communication of information" (article 11). Taken together, those commitments can be interpreted as the provision of financial and capacity-building support for the development of GHG accounting systems, registers, and transaction registries.

5.5 Access to green investment capital

In addition to the mechanisms developed pursuant to the Paris Agreement, a number of multilateral and bilateral funds provide support to developing countries for registry development. The World Bank Partnership for Market Readiness, for example, provides funding to support efforts to build market readiness components, including registry development. Another potential World Bank source is the Forest Carbon Partnership Facility Readiness Fund, which provides support for the development of REDD+ registries. Bilateral sources of support for registry development include the REDD Early Movers Programme, launched by the German Federal Ministry for Economic Cooperation and Development and the Norwegian International Climate and Forest Initiative.

If there are insufficient international or domestic public-sector financial resources available for the development of domestic registries, the authorities may wish to impose fees on market participants to cover the costs of registry development and administration. When imposing fees, however, it is important to take careful note of the financial resources available to market participants.

Conclusion

There are more than 50 GHG offsetting projects currently in operation or planned in Congo Basin Climate Commission countries. Overall, the number and scale of carbon offsetting projects is insufficient for the subregion, which should support further carbon market development in order to reap much-needed economic, social and environmental benefits. Despite huge carbon sequestration opportunities, carbon markets in the region remain poorly financed and fragmented and lack effective coordination mechanisms. This is a main reason why the subregion is characterized by low carbon prices, limited market demand, and a limited number of investors willing to invest in its Member States.

The Congo Basin Climate Commission secretariat should therefore take the lead in coordinating carbon market development in the Congo basin and address the aforementioned challenges. There are at least three ways in which the Commission could promote the development carbon markets in the subregion and beyond:

- By offering project expertise and consultancy services in connection with project identification, planning, development, preparation, and implementation. Consultancy fees may be paid to the Congo Basin Climate Commission secretariat by international project owners or proponents;

- By taking on the role of independent third-party verifier or intermediary in market mechanisms;

- By establishing and administering a GHG offset programme, and facilitating the adoption of the proposed standardized and harmonized protocol and template together with a GHG registry.

Given the current carbon project landscape in the Congo basin and the potential for further carbon market expansion, the third option is likely to be the most appropriate. With sufficient political will among Congo Basin Climate Commission Member States it will be possible to take all necessary technical steps to that end, generating enormous socioeconomic and environmental benefits for the subregion and beyond.

Annex 1: Carbon offsetting projects in Congo Basin Climate Commission countries

Cameroon

Sustainable Agroforestry Ecosystem (SAFE) Project

Size: 1,000 ha.

Status: In development.

Description: The Cameroonian rainforest is one of the richest biological areas on earth. The rainforest offers a habitat for plants, animals and microorganisms. However, deforestation, forest fragmentation, climate change and other stressors increasingly threaten forest biodiversity. Northern Cameroon is comprised primarily of deforested lands that are slowly becoming depleted. The southern forest is decreasing in size from logging activity and fuelwood collection. Rural communities of Cameroon tend to practice sustainable farming, but deforestation poses a threat to their livelihoods due to a reduction in soil fertility. The aim of the SAFE Project is to establish food forests with high carbon stocks in order to improve the conditions of local populations and rehabilitate degraded natural systems.

Through the creation of an interactive variety of multifunctional elements, including plants and trees, it will be possible to build a stable ecosystem. A balanced habitat will provide the local population with different products throughout the year, providing them with food, energy and shelter, while also meeting their other material and non-material needs in a sustainable manner. The difference between a cultivated forest ecosystem and a natural forest ecosystem is that most plant species in a cultivated forest are intended for the beneficial use of humans and livestock. In the SAFE Project, almost every plant is hand-selected to provide and support a direct yield for local communities and promote a harmonious synergy of landscape and people.

Many leguminous species have been integrated into the planting process to support the growth of young fruit trees by fixing atmospheric nitrogen. In this way, it is possible to grow trees on degraded soils without any additional fertilizer, which would negatively affect the GHG emissions balance. Treedom, a tree planting platform based in Italy, is the promoter and administrator of forestry activities related to the SAFE Project. Treedom works in depleted areas that have been severely deforested. Through reforestation activity, Treedom enhances biodiversity, soil fertility and carbon stocks, which generate carbon credits to counterbalance

GHG emissions. SAFE and other similar projects draw on a philosophy of long-term social sustainability achieved in collaboration with local authorities and native populations. Furthermore, through the production and marketing of fair-trade products, including chocolate and tropical fruit, Treedom seeks to improve the socioeconomic conditions and promote food security for local farmers.

A baseline scenario has been established in order to calculate the carbon credits that will be delivered from forest activities. That baseline scenario takes into account the emissions that would occur in the absence of the SAFE Project, which is being implemented in areas comprising a mix of forest and degraded grassland with a low biodiversity index. In those areas, deforestation activities have led to soil depletion and the carbon stock of herbaceous plants is close to zero. The trees planted will, however, gradually improve carbon stocks, which may eventually return to the levels found in contiguous forest (up to 500 $mtCO_2e$ per hectare), or in typical agroforestry systems (up to 800 $mtCO_2e$ per hectare).

Additionality is a typical concept of emission reduction projects. A project is additional if it occurs only thanks to carbon credits. In the context of the SAFE Project, additionality is easy to demonstrate as there are no similar projects in the surrounding area and reforestation is not a lucrative activity, even if it is associated with profitable economic activities, including cacao or tropical fruit production. The emission reduction net value for the Project is calculated as the difference between the carbon removed from the atmosphere thanks to tree carbon stocks and the CO_2 present in degraded grassland, which, as stated previously, is close to zero.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Leticia Espinosa. Organization: Pronatura Mexico. Email: lespinosa@pronatura.org.mx Website: www.pronatura.org.mx.

Community Payments for Ecosystem Services (PES) in the Congo Basin: Nkolenyeng Community Forest

Description: The overarching goal of the Community PES Project is to help communities in Cameroon and, potentially, the broader Congo Basin region to protect forest resources by finding ways to integrate payments for ecosystem services (PES) and community forest management practices. The specific objectives of the Project are to: (a) maintain forest cover, thereby maintaining carbon stocks, biodiversity and the capacity of forests to provide products, protect watersheds and prevent soil erosion; (b) strengthen community forest management by equipping communities with the knowledge and resources they need to manage and protect their environmental assets; (c) provide alternative income-generating activities that

can alleviate poverty, improve livelihoods and bolster the capacity of communities to cope with institutional, economic and natural resource changes; (d) support the development of technical capacity at all levels and the reform or formulation of institutions and community forestry legislation across the subregion, and; (e) feed lessons learned from community-based REDD+ initiatives into relevant regional and international REDD+ policy processes.

Objective: Carbon sequestration or avoided emissions.

Interventions: Improved forest management.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Flobert Deffo Kamto/Willie Mcghee. Organization: Centre pour L'Environnement et le Développement/Bioclimate. Email: dfobert@yahoo.fr; Willie.mcghee@brdt.org.

Dja Biosphere Regional REDD+ Project

Size: 1,228,500 ha.

Status: In development.

Description: The Dja Biosphere Regional REDD+ Project is a 1.2 million hectare avoided deforestation, agroforestry and reforestation project in and around the 620,000 hectare Dja Biosphere Reserve. The Dja is a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage site and is one of the last areas of forest in West-Central Africa that remains relatively untouched by man. However, its unique biodiversity and ecosystems are threatened by deforestation and poaching: (a) deforestation is now occurring right up to, and even within, the margins of the Reserve; (b) poaching occurs deep within the core of the Reserve, involving large mammals such as elephants and chimpanzees. Such activities not only threaten the wildlife within the protected area, but also threaten the traditional way of life of itinerant Baka communities that have lived within the Dja forest for thousands of years. The Project will work with local communities to (a) strengthen the protection of the Reserve from outsiders; (b) develop sustainable agroforestry practices and alternatives to deforestation and poaching, and; (c) reforest at least 5,000 hectares of deforested land in the buffer zone adjacent to the Reserve. Global Green Carbon Corporation, an environmental project development company, developed the Project in collaboration with the Center for Tropical Research, a scientific research institute based at the University of California, Los Angeles with 20 years of experience of working in the Dja.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: University of California, Los Angeles Center for Tropical Research. Email: jdelaney@globalgreencarbon.com.

Protection of Cameroon estuary mangroves through improved smoke houses. Mouanko, Littoral Region

Description: The improved smoke houses project was designed to promote the sustainable use, management and conservation of mangrove systems, which play a key role as fishery support systems and buffers against climate change impacts, through the promotion of the use of energy-saving fish smoke houses in the Douala-Edea mangrove forest, which extends over 20,000 ha along the coast of Cameroon. Mangroves in Cameroon are under serious threat as a result of human activity, including fish smoking, sand extraction and urban infrastructure development, with the country's mangrove forests decreasing in size by some 30 per cent between 1980 and 2006. Fish smoking and processing activities are largely responsible for the degradation and loss of mangroves. Energy-inefficient open-type smoking rafts are traditionally used in kitchens across the Littoral Region. Health problems, including respiratory and eye infections, headaches, general fatigue, the inhalation of toxic wood gases, and occasional fire-related accidents are all associated with fish smoking activities. In collaboration with fish processing experts from the Cameroon Institute of Oceanographic and Fisheries Research, the project organizers sought to improve some 350 traditional smoke houses in nine villages with a total population of 4,500 by 2012. Particular emphasis was placed on using locally-available materials in the construction or strengthening of smoking platforms. The project was expected to reduce wood consumption by some 50 per cent and fish smoking times from three to four days to only five to eight hours. The project was thus expected to have a very positive impact on the mangrove ecosystem in Cameroon. Project activities included sensitization and capacity-building activities for local households, and the identification and improvement of selected smoke houses.

Objective: Carbon sequestration or avoided emissions.

Interventions: Other/unspecified.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information: Name: María Belén Herrera. Organization: Profafor S.A. Email: mherrera@profafor.com.

Community Payments for Ecosystem Services (PES) Project: Noloenyeng Community Forest

Size: 2,984 ha.

Status: In development.

Description: The Community Payments for Ecosystem Services (PES) Project is a pilot project of the Congo Basin Forest Fund that is to be implemented in the Noloenyeng Community Forest. The overarching goal of the Community PES Project is to help communities in Cameroon and, potentially, the broader Congo Basin region to protect forest resources by finding ways to integrate payments for ecosystem services (PES) and community forest management practices.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Wendelin Aubrey. Organization: Congo Basin Forest Fund. Email: Wendelin.Aubrey@brdt.org.

Democratic Republic of the Congo

Jatropha curcas cultivation in the Democratic Republic of the Congo: Masi-Manimba

Size: 14,000 ha.

Status: Active/approved.

Description: The proposed project, entitled "Jatropha cultivation in the Democratic Republic of Congo", will facilitate the establishment of 187 jatropha curcas plantations covering an area of 14,000 ha. of mostly degraded soils. The plantations will be distributed across several rural communities located on tableland steppe in the province of Bandundu. The proposed project is the first of three interrelated sustainable development projects to be carried out under the clean development mechanism. In addition to contributing to GHG sequestration, erosion control and the reclamation of soils, the potential generation of alternative income streams for villagers, and the promotion of sustainable agricultural practices, the cultivation of jatropha will provide harvests of seeds that can be mechanically processed to extract oil and produce biodiesel fuel. The production of biodiesel fuel will constitute the second clean development mechanism project, entitled "Production of biodiesel from jatropha curcas seeds".

The details of the second project are presented in a separate project design document. It is anticipated that biodiesel produced locally from jatropha seeds will replace scarce supplies of diesel fuel, which is currently used to generate electricity. The biodiesel will provide an alternative source of energy for sustainable development in the Bandundu region. The third project, described in another project design document, will facilitate the electrification of rural villages using biodiesel power generated from processed jatropha seeds. The third project will supply villages with a source of alternative energy with a limited ecological footprint that will facilitate development. The third project is entitled "Use of biodiesel for power generation in rural areas of the Democratic Republic of Congo".

The plantations will be located along the main road linking the cities of Kenge, Masi-Manimba and Kikwit, and in areas surrounding those three cities. The plantations are located near villages to facilitate access by villagers. Each 75 ha plantation will be managed by local people via individual allotments of 5 ha per villager, in order to allow a large number of individuals to benefit from an additional source of income. Initially, the project promoter in Kinshasa will build a seed farm. The seeds for that farm will come from Malaysia. They will be used to produce shrubs that will provide the seed in sufficient quantities for the first year of cultivation. The planting schedule will be phased in over four years, and the 187 villages involved in the project will gradually extend the area under cultivation until they reach the 14,000 ha goal. On each plantation, an area of 25 ha will be planted each year to arrive at the final size of each plantation (75 ha). During the four years of the project, the total areas to be planted are: 1,200 ha (year 1), 4,655 ha (year 2), 4,655 (year 3) and 3,490 ha (year 4).

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: ECO_2 International.

Ibi Batéké Forest Project

Size: 400 ha.

Status: Ongoing.

Description: Afforestation or reforestation project.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact Information:

Name: Olivier Mushiete. Organization: Congo Basin Forest Fund. Email: Wendelin.Aubrey@brdt.org. Websites: http://www.ibi- village.cd and https://cdm.unfccc.int/Projects/DB/ErnstYoung1291309493.36/view.

Mai Ndombe REDD+ Project

Size: 299,645 hectares (ha)

Status: Active/approved

Description: The Mai Ndombe REDD+ Project protects over 740,000 acres of humid tropical and swamp forest located in the central part of the Congo River basin in the Democratic Republic of the Congo. The Project and surrounding area have been designated as a high conservation priority within the Congo basin, the world's second-largest intact rainforest.

The project area provides habitat for threatened and endemic species as well as important landscape-level connectivity. The Mai Ndombe REDD+ Project was validated and verified in December 2013 under the Verified Carbon Standard and Climate, Community and Biodiversity Standards. It will avoid more than 175 million tons of CO_2e emissions over its 30-year life. The Mai Ndombe Project makes REDD+ a viable economic alternative to unsustainable commercial logging, helping to prevent the primary and secondary forest extraction that used to cause regional ecosystem fragmentation, biodiversity loss, soil degradation and wetland sedimentation.

The Project's forest conservation activities not only safeguard local communities' environmental health and economic livelihoods, but also their traditional, spiritual, and cultural values. Shortages in clean drinking water access, chronic lack of financial resources for education and health care, and serious concerns over food security, nutrition and economic alternatives made the need for an integrated approach to sustainable development crucial for communities in the Project area. Sales of the project's Verified Emissions Reductions provide a pathway to low-carbon economic development, improved access to potable water, agricultural and economic diversification, education and health care development, and capacity-building activities that empower local communities.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Jeremy T. Freund. Organization: Wildlife Works. Email: jeremy@wildlifeworks.com, Website: www.wildlifeworks.com.

Reforestation project using native species in the Maringa-Lopori-Wamba Landscape and establishment of the Bonobo Peace Forest

Size: 5000 ha.

Status: Active/approved.

Description: A new forest-covered area will be established to create a standard natural habitat unit for the bonobo (Pan paniscus). This species of non-human primate is the most similar species to humans (who share 99 per cent of its genome). Endemic to the forests of the Democratic Republic of the Congo, the bonobo is at high risk of extinction.

The recent civil war in the Democratic Republic of the Congo has fragmented and decimated the bonobo population, which, by some estimates has fallen from some100,000 individuals in 1980 to fewer than 10,000 today. With the end of the war and the return of peace, logging has increased in the few places where isolated bonobo populations continue to survive. A recent United Nations study concluded that only 4 per cent of the original habitat of the bonobo will remain undisturbed by 2030. The bonobo will thus live in the most restricted habitat of any great ape. The aim of the project is to reverse that trend and offer a chance of survival to bonobos and other species in the forests of the Democratic Republic of the Congo.

The Maringa-Lopori-Wamba Landscape has been identified as an important area for biodiversity and has been designated as one of 11 priority landscapes by the Congo Basin Forest Partnership, a global initiative launched in 2002 by the United States of America and South Africa together with 27 public and private partners. New forest corridors with native species will be established, together with a protected public reserve. The project will complement other conservation initiatives, including the establishment of community-based reserves. One of the major threats for bonobos and other species has been the fragmentation of forests. The project will target specific areas of degraded and cleared forests to establish corridors that may promote habitat viability for previously isolated and fragmented bonobo populations. The project will facilitate the planting of trees and shrubs that, either directly or indirectly, can provide bonobos with sources of food. The project will, moreover, expand the potential home range of bonobos, with a consequent positive impact on genetic variability of previously-isolated bonobo populations.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Keren Visser. Email: keren@scg.vg.

Ibi Batéké Carbon Sink Plantation Project

Size: 4,120 ha.

Status: Active/approved.

Description: The Ibi Batéké Carbon Sink Plantation Project is an afforestation and clean energy project. It will convert a natural grassy savanna, disturbed by man-initiated fires, into an area providing an abundant and sustainable supply of firewood for charcoal production. Carbon sequestration from the atmosphere will take place in tandem with a reduction in GHG emissions, resulting from the prevention of savanna fires and a transition to non-fossil fuels.

To complete those objectives, the Project will facilitate the establishment of 4,120 ha of fast growing forest plantations of eucalyptus and acacia trees, together with other local tree species, on the savanna on the Batéké Plateau. Some 90 per cent of the Plateau is covered by herbaceous or shrubby savanna that is subject to frequent burning, while 10 per cent is covered by forest that is often degraded by local populations practicing subsistence agriculture, including maize and cassava cultivation, and by charcoal production.

The Project will use sources of carbon finance to generate resources for health, education, and agroforestry activities and will sequester an estimated 2.4 million tons of CO_2e over the next 30 years.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Mike Mitchell. Email: mitch@ifsgrowth.co.nz.

Kitshanga Reforestation Project

Size: 18 ha.

Status: Active/approved.

Description: The Kitshanga Reforestation Project is being implemented in North Kivu Province, 77 km north of the provincial capital Goma. The Project is facilitating the reforestation of 18 ha of land inside the 194 ha of farmland allocated to the Diocese of Goma in Masisi Territory. Most of the reforestation will take place on sloping terrain where no agriculture and cattle ranching is taking place. Some reforestation will create a natural fence at the edge of farmland to prevent the passage of cattle. The project site has been allocated to the Diocese of Goma under the terms of a 25-year concession agreement.

Caritas Goma is recognized as the owner of the carbon credits. In the absence of the Project, the area would probably become increasingly degraded as a result of fuelwood collection, charcoal burning, cattle and goat grazing and timber production. The last isolated trees would be cut down and bushes and tree stumps cut for charcoal production and to favor the growth of grass species suitable for livestock grazing. It is, moreover, likely that illegal biomass removal, cattle grazing, and charcoal production would extend into the Virunga National Park, located nearby. It is estimated that each ton of CO_2 sequestered as a result of the reforestation project will be worth approximately 7 euro. The project lifetime is limited to 49 years; during that period, a total of 2980 tons of CO_2 is likely to be absorbed by the trees planted in the context of the Project. A permanence buffer of 30 per cent carbon credits has been established. To ensure its success, the Project has adopted a number of international best practices, including those prescribed in the Carbon Fix Standard, the Climate, Community and Biodiversity Standards and the Verified Carbon Standard.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

New Forests, New Stoves and Agroforestry for Kivu: South Kivu

Size: 2,110 ha.

Status: Active/approved.

Description: The New Forests, New Stoves and Agroforestry for Kivu project will facilitate the afforestation of three severely logged and eroded areas. The expected outcomes are improved livelihoods for the populations of 94 villages and the establishment of secondary rainforest areas in the central mountain range in eastern South Kivu. Erosion control on slopes in the hilly countryside and in agricultural areas will necessitate the planting of erosion-inhibiting plants, including tripsacum grasses and certain species of tree and shrub. The project will also provide for the cultivation of trees and crops side by side in order to enhance sustainable production and promote carbon sequestration through afforestation.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Gabon

Gabon Fertilizer Company imperilled species/habitats, Mandji Island

Description: No description is available for this project at this time.

Objective: Habitat/species conservation, wetland conservation.

Interventions: Habitat creation/re-establishment.

Market mechanism: Compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: Gabon Fertilizer Company.

Kenya

International Small Group and Tree Planting Program (TIST), Meru

Size: 13,390 ha.

Status: Active/approved.

Description: No description is available for this project at this time.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: Clean Air Action Corporation. Website: www.cleanairaction.com/#tist-a-breakthrough-project.

Vi Agroforestry project, Endebess

Size: 20,000 ha.

Status: Unknown

Description: No description is available for this project at this time.

Objective: Carbon sequestration or avoided emissions.

Interventions: Sustainable agricultural practices.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: Livelihoods Fund. Website: www.livelihoods.eu/projects/mount-elgon-kenya/.

Forest Again (Kakamega Forest) project: Kakamega Forest National Reserve

Size: 490 ha.

Status: Active/approved.

Description: This is a carbon forest validation exercise undertaken as part of the Forest Again reforestation project, developed on behalf of the Kenyan Forest Service on public land located in the Kakamega Forest National Reserve in Western Province. The project intends to reforest approximately 473 hectares of cleared open forest and grassland to mimic the original indigenous forest. The overarching aim is to restore and conserve biodiversity, enhance local livelihoods, and sequester approximately 422,000 $mtCO_2e$ over the 40-year lifespan of the project.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Anton Espira. Organization: Eco2Librium. Email: aespira@eco2librium.net. Website: www.eco2librium.net/about us.html.

Treeflights Kenya: Bore

Description: The Treeflights Kenya planting project, located in Bore, near Malindi in Coastal Province, is significantly different from all other planting projects in the area. Rather than planting on one site, the trees are distributed to local farmers to plant on their own land. Currently cashew-nut trees are distributed as they are drought resistant, fast growing and produce a useful high-protein cash crop after as little as four years.

The beauty of the scheme is that farmers have a strong stake in ensuring that their trees survive and, once the cashews start yielding their crop, the community is able to generate an alternative source of income and is no longer compelled to cut down existing forests to make charcoal. As is the case in most of sub-Saharan Africa, Kenya has a very low per capita carbon footprint, but is disproportionately affected by global climate change. Indeed, industrialized countries have created a problem that is having a disproportionate impact on countries and communities with very limited capacity to take climate change mitigation measures.

Recent research has shown that the greatest "cooling effect" is under the trees and forests located near the Equator. For this reason alone, it makes very good sense to plant trees and protect forests in the tropics.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: Treeflights. Email: admin@treeflights.com.

Kasigau Corridor REDD+ Project: Taita Taveta

Size: 200,000 ha.

Status: Active/approved.

Description: The Kasigau Corridor REDD+ Project protects nearly 500,000 acres of dryland forest in southeastern Kenya, securing the wildlife migration corridor between Tsavo East and Tsavo West National Parks. Prior to the Project, the forested area was under intense threat from slash and burn agriculture. The regional advancement of alternative livelihoods and sustainable community development have been key to the Project's realization.

The Kasigau Corridor REDD+ Project was the first REDD+ project in the world to achieve Verified Carbon Standard validation and verification and, in February 2011 the Project was issued credits and awarded Gold Level status by the Climate, Community and Biodiversity Standard for the exceptional regional benefits it generates. The Project is expected to prevent the emission of over 55 million mtCO_2e over its 30-year lifespan. Over 110,000 rural Kenyans benefit from the project, including 4,500 local landowners, through the distribution of carbon revenue, providing a low-carbon development pathway for the Project area's rural communities. Job creation is a core conservation strategy of the Project, which employs nearly 300 local citizens as forest and wildlife rangers, plot sampling staff, horticulturists, eco-factory workers, construction workers, mechanics and administrative personnel who were previously compelled to destroy their environment just to survive. Additionally, the Project has promoted education, water access, women's empowerment and small enterprise business opportunities. Furthermore, the intensive agricultural methods promoted by the Project have discouraged local communities from continuing slash and burn agricultural practices and have enhanced food security.

The Kasigau Corridor REDD+ Project has also achieved very positive results in terms of biodiversity preservation and is credited with a rebound in subregional populations of endangered species, including the African elephant, Grévy's zebra, cheetah and lion. The Kasigau Corridor REDD+ Project is located in Taita Taveta District in Coast Province, approximately two hours northwest of Mombasa. The Project area mostly comprises low-density forestland, scrubland and grassland savanna and is being implemented on a private leasehold estate provided by the Government of Kenya to Rukinga Ranching Company Ltd,

whose majority shareholder is BenBo International, an offshore trust, which was established by a major investor in Wildlife Works Inc. and Wildlife Works Carbon LLC.

Wildlife Works Inc. is an export processor of consumer goods destined for retail markets in Europe and the United States of America. The company supports the conservation of wilderness habitats, the creation of jobs and the construction of schools. Wildlife Works Inc. was granted a conservation easement from Rukinga Ranching Company in 2009 after the Project start date of 1 January 2006. That easement effectively transferred all carbon and biodiversity rights from Rukinga Ranching Company to Wildlife Works Inc. Wildlife Works Inc. and Wildlife Works Carbon LLC, which initiated Project activities, are collectively referred to as "the project proponent" in project activity validation reports. Major project activities focus on the protection of the wildlife migration corridor and the preservation of wildlife habitats and carbon stocks. The Project has, moreover, involved local communities through greenhouse-based tree production, agricultural outreach, job creation and the construction of schools. The project lifetime and crediting period is 20 years.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Jeremy T. Freund. Organization: Wildlife Works. Email: jeremy@wildlifeworks.com. Website: www.wildlifeworks.com.

Aberdare Range/Mt. Kenya Small Scale Reforestation Initiative/Kamae-Kipipiri Small-scale afforestation/reforestation project: Kinangop Constituency

Size: 227 ha.

Status: Active/approved.

Description: In 2007 and 2008 the Aberdare Range/Mt. Kenya Small Scale Reforestation Initiative reforested 1,763 ha of degraded forest lands in the Aberdare Range and Mt. Kenya region. Lands chosen were in the catchment areas of the Tana River within the Aberdare and Mt. Kenya Reserve Forests and were reforested using a mix of fast, medium and slow growing indigenous species. The project was implemented by Green Belt Movement on behalf of community forest associations, in association with the Ministry of Environment and Natural Resources and the Kenya Forest Service.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Frederick Njau. Organization: Green Belt Movement. Email: fnjau@greenbeltmovement.org.

Mikoko Pamoja project: Gazi Bay

Size: 107 ha.

Status: In development.

Description: The overall objective of the project is to mobilize financial resources for the protection and restoration of mangrove ecosystems in Kenya through the provision of and payment for quantifiable ecosystem services. The proposed project aims to protect, enhance and expand an area of mangrove forest at Gazi in southern Kenya, in the expectation that it will inform mangrove conservation throughout Kenya. This is a blue carbon coastal project and the first project to sell voluntary credits outside the mechanisms developed by the UNFCCC secretariat. The Project Manager is James Cairo. The project can be replicated in many coastal countries and a similar project is now in the planning stages in Madagascar.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets. Plan Vivo, a United Kingdom-based non-governmental organization, has been engaged as the project verifier. Credits are available for purchase by civil society organizations, academic institutions and conference centres.

Contact information:

Name: Jena Meredith. Email: jmeredith@conservationfund.org.

Farmer's Life East Africa project: Nyandarua

Description: The Farmer's Life East Africa project is a demonstration site in Kenya for an eco-credit system developed by F3 Life, a developer of tools that facilitate climate-smart credit provision by agricultural lenders. Clients use loans to invest in farming businesses with the aim of boosting their incomes. Farmer's Life East Africa is recruiting farmers from established farmers groups. Farmers who wish to become clients sign a loan agreement, agreeing to pay back their loan with interest. Farmers also sign a land management agreement as part of their loan agreement, agreeing how they will manage their land.

To qualify for loans at reduced interest rates, farmers must plant grass strips and trees across the contours of their land. This protects their farms from soil erosion. Without preventative measures, slopes are at risk of soil erosion, leading to reduced crop yields and the siltation of rivers, lakes, and dams. Grass strips grow to form a barrier against soil erosion, in time creating terraces behind the grass. Farmers receive their loans via the M-Pesa mobile money platform. Farmers also receive farming advice from a Farmer's Life farming advisor. The approach adopted protects soils at risk of erosion after harvests and during rains, and secures the protection of agricultural soils and watersheds. An initial proof of concept trial stage was launched with 50 farmers before being scaled up in 2017 to include 350 farmers. The trial involving the 50 smallholder farmers was particularly successful. Additionally, because of the success of the proof of concept, Farmer's Life East Africa was able to mobilize finance through Kiva, a crowd-lending platform, at zero per cent interest for the second phase of the project

Objective: Improving water quality (reducing pollutants).

Interventions: Habitat creation/re-establishment, sustainable agricultural practices.

Market mechanism: Bilateral agreement(s).

Co-benefits: Climate change adaptation, employment and training opportunities.

Contact information:

Organization: F3 Life.

Upper Tana–Nairobi Water Fund project

Description: The Tana River basin is a major source of water and hydroelectric power for Nairobi residents. Sedimentation from farmland areas upstream of the city has resulted in treatment costs rising by as much as a third and threatens to impede electricity generation. Overuse and poor infiltration have also been linked to low dry season flows. The Nature Conservancy, a global environmental non-profit organization, is facilitating the development of an endowment fund to support watershed protection projects, in collaboration with the Kenya Electricity Generating Company PLC, a Kenyan power utility, the Nairobi Water and Sewerage Company, the Water Resources Management Authority, and the International Center for Tropical Agriculture. Potential private sector stakeholders include the Coca-Cola Company and East African Breweries. A steering committee has carried out a technical feasibility study and identified priority watersheds in the upper Tana River basin. It is anticipated that donors and downstream water users will support the project with the Kenyan Government offering in-kind and technical support. Three pilot projects are being launched on suitable agricultural land.

Objective: Surface flow restoration/augmentation.

Interventions: Habitat restoration/enhancement, habitat creation/re-establishment, habitat preservation, sustainable agricultural practices, sustainable forest management.

Market mechanism: Collective action fund.

Co-benefits: Species/habitat conservation, employment and training opportunities.

Contact information:

Organization: The Nature Conservancy.

Imarisha Naivasha Water Stewardship Project: Naivasha

Description: No description is available for this project at this time.

Objective: Unknown.

Interventions: Habitat creation/re-establishment.

Market mechanism: Bilateral agreement(s).

Co-benefits: Community benefits.

Contact information: Organization: International Water Stewardship Programme.

Lake Naivasha Basin Integrated Water Resources Action Plan (IWRAP) Project

Size: 1,550 ha

Status: Active/approved

Description: The Lake Naivasha river basin is critical for the local horticulture, tourism, and geothermal power generation industries. The basin area faces increasing watershed degradation, including quality issues and shortages. The World Wide Fund for Nature and CARE International, two non-governmental organizations, operating through the so-called equitable payments for watershed services programme, have supported the development of a watershed payment mechanism between upstream communities and downstream users in the Lake Naivasha basin.

Buyers located around Lake Naivasha compensate land managers for land use interventions, including maintaining riparian areas, limiting erosion, and reducing the use of fertilizers and pesticides. The first contract between buyers and sellers was signed in 2010 between the Wanjohi Water Resource Users Association and the Upper Turasha Water Resource Users Association (representing water users in the upper catchment area), and the Lake Naivasha Water Resource Users Association downstream. The Lake Naivasha Water Resource Users Association includes the Lake Naivasha Growers Group and other individual flower companies around the Lake.

The Lake Naivasha Water Resource Users Association agreed to pay the two upper catchment water resource users associations for their interventions to rehabilitate degraded farms upstream. Participating farmers each receive vouchers worth $17 annually through their water resource users associations. Contracts are negotiated annually between the Lake Naivasha Water Resource Users Association and the two upstream Associations.

Objective: Surface flow restoration/augmentation, improving water quality (reducing pollutants).

Interventions: Habitat restoration/enhancement, habitat preservation, sustainable agricultural practices, sustainable forest management.

Market mechanism: Collective action fund.

Co-benefits: Species/habitat conservation, community benefits, including employment opportunities and training.

Contact information:

Organization: World Wide Fund for Nature

Uganda

Uganda Nile Basin Reforestation Project No 4

Size: 347.1 ha.

Status: Active/approved.

Description: This small-scale clean development mechanism afforestation/reforestation project is part of a project cluster of five similar projects aiming to provide a new financing mechanism to overcome barriers impeding the establishment of timber plantations in Uganda and to allow communities to reap the benefits of clean development. Project activities cover an area of 347.1 ha within Rwoho Central Forest Reserve (National Forestry Authority planting

area: 324.9 ha (94 per cent); community planting area: 22.2 ha (6 per cent). The Reserve covers in total an area of 9,100 ha. Based on conservative estimates, with a 22-year rotation cycle for all tree species, the project was expected to absorb 24,421 $mtCO_2e$ by 2012. The project facilitates the engagement of private and community-based tree planting initiatives with different degrees of investor involvement.

Due diligence, monitoring, validation and verification costs are shared among the project cluster. On the basis of the successful implementation of the first pilot cluster, the portfolio is to be expanded across the country, targeting a number of deforested public forest reserves and regions. Hence, a project design that can be easily replicated has been developed. The National Forestry Authority is the main investor in the Project, and is responsible for 94 per cent of investor shares and 94 per cent of the Project area. The National Forestry Authority is currently the only organization in Uganda able to provide international investors with guarantees, should the Project fail to deliver on its promises.

Co-investors include community groups, including the Rwoho Environmental Conservation and Protection Association, which currently has 250 members interested in tree planting. Many of those members already have a track record of successful tree planting. Community groups manage the remaining 6 per cent of the Project area. As the Project progresses, communities and private enterprises are expected to play an increasingly important role, and to take action on the basis of lessons learned from the first project cluster.

Community groups will receive payments for each $mtCO_2e$ sequestered, at a price stipulated in an emission reductions purchase agreement concluded by the buyer and the National Forestry Authority. Detailed rights and responsibilities are regulated in community forest management agreements and the terms stipulated for the issuance tree farming licences. The National Forestry Authority provides seedlings and technical advice to community groups. In return they agree to protect the plantations from fire and to restore burnt areas of forest.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Names: Damian Akankwasa and Clini Corrado. Organizations: National Forestry Authority, Italian Ministry for the Environment and the Protection of Land and Sea. Emails: damianb@nfa.org.ug; info@nfa.org.ug; corrado.clini@minambiente.it. Website: www.nfa.go.ug.

Natural High Forest Rehabilitation Project, Kibale National Park

Size: 10,000 ha.

Status: Active/approved.

Description: This project is being implemented in Kibale National Park in western Uganda by the Uganda Wildlife Authority in cooperation with Face the Future, a company based in the Netherlands. The area has suffered severe vegetation and soil erosion due to poor forest management, fires, grazing activities and charcoal production. The project contributes to climate change mitigation by planting indigenous tree species, thereby supporting natural regeneration. The purpose of the project is to realize multiple socioeconomic and environmental goals, including climate change mitigation, biodiversity conservation, local community development and soil erosion control, through the restoration of forest vegetation on degraded lands.

The Ugandan Government invited Face the Future to carry out restoration work to demonstrate its commitment to sound conservation in this primate-rich forest and generate employment opportunities for surrounding communities. Face the Future and Uganda Wildlife Authority have adopted innovative approaches in order to accelerate that process in a cost-effective manner. To date, over 3,600 hectares have been rehabilitated and the rehabilitation of an additional 5,000 hectares are planned. Environmental goals include: (a) replacing elephant grass with the original vegetation in order to increase the biodiversity of the area; (b) restoring the forest in order to improve water quality water in surrounding areas, and; (c) restoring the habitat of the chimpanzee and other primates.

Social impact goals include: (a) creating employment opportunities for local communities, including jobs that include planting, weeding and tending forest vegetation; (b) deepening engagement with local communities. Currently some 300 people are involved in the project on a part time or ongoing basis, and; (c) enhancing relationships among communities and elevating the status of women by ensuring their participation in project activities.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Mark Kean. Organization: Mikro-Tek Inc. Email: mikro-tek@mikro-tek.com Website: www.mikro-tek.com.

Uganda Nile Basin Reforestation Project No 1

Size: 468 ha.

Status: Active/approved.

Description: This small-scale clean development mechanism afforestation/reforestation project is part of a project cluster of five similar projects aiming to provide a new financing mechanism to overcome barriers impeding the establishment of timber plantations in Uganda and to allow communities to reap the benefits of clean development. Project activities cover an area of 468 ha within Rwoho Central Forest Reserve (National Forestry Authority planting area: 402.4 ha (86 per cent); community planting area: 65.6 ha (14 per cent). The Reserve covers in total an area of 9,100 ha. Based on conservative estimates, with a 22-year rotation cycle for all tree species, the project was expected to absorb 15,113 mtCO_2e by 2012. The project facilitates the engagement of private and community-based tree planting initiatives with different degrees of investor involvement.

Due diligence, monitoring, validation and verification costs are shared among the project cluster. On the basis of the successful implementation of the first pilot cluster, the portfolio is to be expanded across the country, targeting a number of deforested public forest reserves and regions. Hence, a project design that can be easily replicated has been developed. The National Forestry Authority is the main investor in the Project, and is responsible for 86 per cent of investor shares and 86 per cent of the Project area. The National Forestry Authority is currently the only organization in Uganda able to provide international investors with guarantees should the Project fail to deliver on its promises. Co-investors include community groups, including the Rwoho Environmental Conservation and Protection Association, which currently has 250 members interested in tree planting. Many of those members already have a track record of successful tree planting.

Community groups manage the remaining 14 per cent of the Project area. As the Project progresses, communities and private enterprises are expected to play an increasingly important role, and to take action on the basis of lessons learned from the first project cluster. Community groups will receive payments for each mtCO_2e sequestered, at a price stipulated in an emission reductions purchase agreement concluded by the buyer and the National Forestry

Authority. Detailed rights and responsibilities are regulated in community forest management agreements and the terms stipulated for the issuance of tree farming licences. The National Forestry Authority provides seedlings and technical advice to community groups. In return they agree to protect the plantations from fire and to restore burnt areas of forest.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Names: Damian Akankwasa and Clini Corrado. Organizations: National Forestry Authority, Italian Ministry for the Environment and the Protection of Land and Sea. Emails: damianb@nfa.org.ug; info@nfa.org.ug; corrado.clini@minambiente.it. Website: www.nfa.go.ug.

Uganda Nile Basin Reforestation Project No 2

Size: 370 ha.

Status: Active/approved.

Description: This small-scale clean development mechanism afforestation/reforestation project is part of a project cluster of five similar projects aiming to provide a new financing mechanism to overcome barriers impeding the establishment of timber plantations in Uganda and to allow communities to reap the benefits of clean development. Project activities cover an area of 370 ha within Rwoho Central Forest Reserve (National Forestry Authority planting area: 334.1 ha (90 per cent); community planting area: 35.9 ha (10 per cent).

The Reserve covers in total an area of 9,100 ha. Based on conservative estimates, with a 22-year rotation cycle for all tree species, the project was expected to absorb 7,809 mtCO_2e by 2012. The project facilitates the engagement of private and community-based tree planting initiatives with different degrees of investor involvement. Due diligence, monitoring, validation and verification costs are shared among the project cluster. On the basis of the successful implementation of the first pilot cluster, the portfolio is to be expanded across the country, targeting a number of deforested public forest reserves and regions. Hence, a project design that can be easily replicated has been developed.

The National Forestry Authority is the main investor in the Project, and is responsible for 90 per cent of investor shares and 90 per cent of the Project area. The National Forestry Authority is currently the only organization in Uganda able to provide international investors with

guarantees should the Project fail to deliver on its promises. Co-investors include community groups, including the Rwoho Environmental Conservation and Protection Association, which currently has 250 members interested in tree planting. Many of those members already have a track record of successful tree planting. Community groups manage the remaining 10 per cent of the Project area. As the Project progresses, communities and private enterprises are expected to play an increasingly important role, and to take action on the basis of lessons learned from the first project cluster. Community groups will receive payments for each $mtCO_2e$ sequestered, at a price stipulated in an emission reductions purchase agreement concluded by the buyer and the National Forestry Authority. Detailed rights and responsibilities are regulated in community forest management agreements and the terms stipulated for the issuance of tree farming licences. The National Forestry Authority provides seedlings and technical advice to community groups. In return they agree to protect the plantations from fire and to restore burnt areas of forest.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Names: Damian Akankwasa and Clini Corrado. Organizations: National Forestry Authority, Italian Ministry for the Environment and the Protection of Land and Sea. Emails: damianb@nfa.org.ug; info@nfa.org.ug; corrado.clini@minambiente.it. Website: www.nfa.go.ug.

Uganda Nile Basin Reforestation Project No 5

Size: 487.6 ha.

Status: Active/approved.

Description: This small-scale clean development mechanism afforestation/reforestation project is part of a project cluster of five similar projects aiming to provide a new financing mechanism to overcome barriers impeding the establishment of timber plantations in Uganda and to allow communities to reap the benefits of clean development. Project activities cover an area of 487.6 ha within Rwoho Central Forest Reserve (National Forestry Authority planting area: 413 ha (85 per cent); community planting area: 74.6 ha (15 per cent). The Reserve covers in total an area of 9,100 ha. Based on conservative estimates, with a 22-year rotation cycle for all tree species, the project was expected to absorb 41,574 $mtCO_2e$ by 2012.

The project facilitates the engagement of private and community-based tree planting initiatives with different degrees of investor involvement. Due diligence, monitoring, validation and verification costs are shared among the project cluster. On the basis of the successful implementation of the first pilot cluster, the portfolio is to be expanded across the country, targeting a number of deforested public forest reserves and regions. Hence, a project design that can be easily replicated has been developed. The National Forestry Authority is the main investor in the Project, and is responsible for 85 per cent of investor shares and 85 per cent of the Project area.

The National Forestry Authority is currently the only organization in Uganda able to provide international investors with guarantees should the Project fail to deliver on its promises. Co-investors include community groups, including the Rwoho Environmental Conservation and Protection Association, which currently has 250 members interested in tree planting. Many of those members already have a track record of successful tree planting. Community groups manage the remaining 15 per cent of the Project area. As the Project progresses, communities and private enterprises are expected to play an increasingly important role, and to take action on the basis of lessons learned from the first project cluster. Community groups will receive payments for each $mtCO_2e$ sequestered, at a price stipulated in an emission reductions purchase agreement concluded by the buyer and the National Forestry Authority.

Detailed rights and responsibilities are regulated in community forest management agreements and the terms stipulated for the issuance of tree farming licences. The National Forestry Authority provides seedlings and technical advice to community groups. In return they agree to protect the plantations from fire and to restore burnt areas of forest.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Names: Damian Akankwasa and Clini Corrado. Organizations: National Forestry Authority, Italian Ministry for the Environment and the Protection of Land and Sea. Emails: damianb@nfa.org.ug; info@nfa.org.ug; corrado.clini@minambiente.it. Website: www.nfa.go.ug.

Degraded Lands project: Dokolo

Size: 2,099 ha.

Status: Active/approved.

Description: The overall objective of the project is to help mitigate climate change, meet the growing demand for high-quality wood products from well managed plantation forests, and contribute to sustainable environmental management, community development and poverty alleviation in Uganda. Specific objectives of the proposed project are: (a) to establish and manage forest plantations. With an annual loss of 2.2 per cent of its forest area, Uganda was among the 10 countries with the world's highest deforestation rates between 2000 and 2005. Uganda must expand its wood resources substantially to meet growing demand for wood products and alleviate the significant pressure being placed on its remaining natural forests.

The implementation of the project will: (a) benefit the forestry sector by helping to increase the timber supply, enhancing the management and overall sustainability of the country's national resource base, and alleviating pressure on the country's natural forests; (b) sequester carbon dioxide through forest planting, generating high-quality GHG emission reductions that can be measured, monitored and verified. Project participants will demonstrate the effectiveness of carbon sequestration from forest plantations in order to encourage private investment in the forestry sector, especially on degraded lands; (c) promote environmental conservation, including soil conservation, the protection of water sources, the protection and management of indigenous flora and fauna, and the planting, wherever possible, of indigenous tree species, and; (d) promote the socioeconomic development of local communities, inter alia, by: (i) encouraging tree planting/afforestation activities within local communities, (ii) providing employment opportunities, (iii) supporting the sale of carbon credits, (iv) establishing community woodlots for the villages surrounding the project area on community-owned land, with the objective of increasing the fuel and timber available to those communities, (v) allocating 10 per cent of carbon revenues generated by the project to community development initiatives in the villages surrounding the project area, and (vi) developing local infrastructure, including roads, health-care facilities, water infrastructure and communication systems.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Andre Alves. Organization: Carbon Friendly. Email: andre@carbonfriendly.com. Website: www.carbonfriendly.com.

Trees for Global Benefit

Size: 4,065 ha.

Status: Active/approved.

Description: The project aims are to: (a) Raise awareness of climate change and related issues; (b) increase household incomes through carbon payments; (c) offer farmers technical advice and facilitate their access to timber, fuelwood, fruit, fodder and other markets, and; (d) conserve biodiversity by promoting the cultivation of indigenous tree species. The project, which is being implemented in collaboration with established groups of farmers, facilitates agroforestry and the establishment of small-scale plantations.

Activities include: (a) planting mixed native tree species, including mahogany, cedar, African cherry, laurel, and silk trees with a view to increasing the supply of timber; (b) boundary planting with a view to increasing the supply of fuel wood and fruit; (c) Protecting wildlife and native forest remnants. The amount of carbon sequestered varies depending on the type of land use system that is implemented. Woodlots are the most popular choice for farmers. Woodlots sequester significant carbon (around 70tC/ha) and comprise approximately 240 trees per hectare. The project was a SEED Global Partnership Low Carbon Award winner in 2013.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Pauline Kalunda. Organization: Ecotrust. Email: pnantongo@yahoo.com. Website: www.ecotrust.org.

Uganda Nile Basin Reforestation Project No. 3

Size: 342 ha.

Status: Active/approved.

Description: This small-scale clean development mechanism afforestation/reforestation project is part of a project cluster of five similar projects aiming to provide a new financing mechanism to overcome barriers impeding the establishment of timber plantations in Uganda and to allow communities to reap the benefits of clean development. Project activities cover an area of 341.9 ha within Rwoho Central Forest Reserve (National Forestry Authority planting area: 319.2 ha (93 per cent); community planting area: 22.7 ha (7 per cent). The Reserve covers in total an area of 9,100 ha. Based on conservative estimates, with a 22-year rotation cycle for all tree species, the project was expected to absorb 29,795 $mtCO_2e$ by 2012.

The project facilitates the engagement of private and community-based tree planting initiatives with different degrees of investor involvement. Due diligence, monitoring, validation and verification costs are shared among the project cluster. On the basis of the successful implementation of the first pilot cluster, the portfolio is to be expanded across the country, targeting a number of deforested public forest reserves and regions. Hence, a project design that can be easily replicated has been developed. The NFA is the main investor in the Project, and is responsible for 93 per cent of investor shares and 93 per cent of the Project area. The National Forestry Authority is currently the only organization in Uganda able to provide international investors with guarantees should the Project fail to deliver on its promises. Co-investors include community groups, including the Rwoho Environmental Conservation and Protection Association, which currently has 250 members interested in tree planting. Many of those members already have a track record of successful tree planting. Community groups manage the remaining 7 per cent of the Project area. As the Project progresses, communities and private enterprises are expected to play an increasingly important role, and to take action on the basis of lessons learned from the first project cluster.

Community groups will receive payments for each $mtCO_2e$ sequestered, at a price stipulated in an emission reductions purchase agreement concluded by the buyer and the National Forestry Authority. Detailed rights and responsibilities are regulated in community forest management

agreements and the terms stipulated for the issuance of tree farming licences. The National Forestry Authority provides seedlings and technical advice to community groups. In return they agree to protect the plantations from fire and to restore burnt areas of forest.

Objective: Carbon sequestration or avoided emissions

Interventions: Afforestation or reforestation

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets

Contact information:

Organization: Italian Ministry for the Environment and the Protection of Land and Sea. Email: Corrado.clini@minambiente.it; olavb@nfa.org.ug.

Bukaleba Forest Project

Size: 2,061 ha.

Status: Active/approved.

Description: The Bukaleba Forest Project is being implemented in Mayuge District, located within the Bukaleba Central Forest Reserve. The aim of the Project is to establish and manage exotic and indigenous reforestation on 2,061.6 ha of degraded shrub and grassland. The overall objective of the project is to help mitigate climate change, meet the growing demand for high-quality wood products from well-managed plantation forests, and contribute to sustainable environmental management, community development and poverty alleviation in Uganda. The specific objective of the project is to establish and manage forest plantations.

With an annual loss of 2.2 per cent of its forest area, Uganda was among the 10 countries with the world's highest deforestation rates between 2000 and 2005. Uganda must expand its wood resources substantially to meet growing demand for wood products and alleviate the significant pressure being placed on its remaining natural forests. The implementation of the project will: (a) benefit the forestry sector by helping to increase the timber supply, enhancing the management and overall sustainability of the country's national resource base, and alleviating pressure on the country's natural forests; (b) sequester carbon dioxide through forest planting, generating high-quality GHG emission reductions that can be measured, monitored and verified. Project participants will demonstrate the effectiveness of carbon sequestration from forest plantations in order to encourage private investment in the forestry sector, especially on degraded lands; (c) promote environmental conservation, including soil conservation, the protection of water sources, the protection and management of indigenous flora and fauna, and the planting, wherever possible, of indigenous tree species, and; (d) promote the

socioeconomic development of local communities, inter alia, by: (i) encouraging tree planting/afforestation activities within local communities, (ii) providing employment opportunities, (iii) supporting the sale of carbon credits, (iv) establishing community woodlots for the villages surrounding the project area on community-owned land, with the objective of increasing the fuel and timber available to those communities, (v) allocating 10 per cent of carbon revenues generated by the project to community development initiatives in the villages surrounding the project area, and (vi) developing local infrastructure, including roads, health-care facilities, water infrastructure and communication systems.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Names: Nicholas Embden; Isaac Kapalaga. Organizations: Green Resources; Lango Forestry Co. Ltd. Emails: nicholas.embden@greenresources.no; isaac.kapalaga@greenresources.no.

Rwambu Watersheds project

Description: No description is available for this project at this time.

Objective: Unknown.

Interventions: Habitat preservation, sustainable agricultural practices.

Market mechanism: Bilateral agreement(s).

Co-benefits: Community benefits.

Contact information:

Organization: Joint Effort to Save the Environment (JESE).

Improved Community Livelihoods and Sustainable Water Management in the River Rwizi Catchment: Mbarara

Size: 500 ha.

Status: Pilot/demonstration.

Description: No description is available for this project at this time.

Objective: Unknown.

Market mechanism: Collective action fund.

Co-benefits: Community benefits, employment and training opportunities.

Contact information:

Organization: Rwizi Catchment Management Organization.

Rwenzori Mountains National Park Watersheds project

Description: No description is available for this project at this time.

Objective: Unknown.

Contact information:

Organization: World Wide Fund for Nature Uganda

United Republic of Tanzania

Carbon Tanzania and Mpingo Conservation Development Initiative

Size: 25,000 ha.

Status: In development.

Description: Management of miombo woodlands within designated Village Land Forest Reserves through early burning and fire control. Significant expansion of community-owned and sustainably-managed forest (approximately 25,000 ha of forest around six villages). More people are able to earn an income and generate benefits from their forests, either through REDD+ activities or by participating in the Mpingo Conservation Development Initiative group certification scheme (approximately 10,000 people). CO_2 emissions are reduced, with between

520,000 and 1,850,000 $mtCO_2e$ sequestered over a 10-year period. Biodiversity is conserved, including mammals such as the lion, leopard, elephant, buffalo, hippopotamus and the cape hunting dog, and mpingo woodland and other coastal tree species.

Objective: Carbon sequestration or avoided emissions.

Interventions: Improved forest management.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Marc Baker. Organization: Carbon Tanzania. Email: info@carbontanzania.com. Website: www.mpingoconservation.org/.

Reforestation of grasslands in Uchindile, Kilombero and in Mapanda, Mufindi

Size: 10,814 ha.

Status: Active/approved.

Description: The project aims to reforest 10,814 ha of degraded land in the Southern Highlands of the United Republic of Tanzania and put 7,565 hectares into conservation to protect local biodiversity. The project will generate permanent verified emission reductions over a 99-year crediting period, guaranteed by a reserve buffer. From 2002 to 2008 the project sequestered an estimated 611,418 $mtCO_2e$, with a further 2,873,417 $mtCO_2e$ expected between 2008 and 2020. The project was certified under the Forest Stewardship Council standard, the world's leading standard for sustainable forest management, in 2008.

The project relies on revenues from carbon financing and timber revenues to ensure its commercial viability. The project offers significant employment in a poor rural region with few other job opportunities. Some 50 permanent and more than 1,000 temporary employees are provided with work in Mapanda and Uchindile. Green Resources, which employs and provides training to more than 3,000 staff across Africa, is committed to supporting local communities through investment in schools and health facilities and in the provision of safe water. Green Resources also promotes community tree planting by giving away seedlings and providing necessary training in silviculture. All carbon revenues are reinvested in the United Republic of Tanzania and 10 per cent of carbon revenues are spent on additional community projects. Both the Uchindile and Mapanda projects applied an approved clean development mechanism methodology for afforestation/reforestation and carried out additional analysis in line with the Verified Carbon Standard requirements to determine the size of the risk buffer.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Denilson Cardoso. Organization: SPVS. Email: denilson@spvs.org.br. Website: http://www.spvs.org.br.

Hifadhi ya Misitu ya Asili ya jamii (HIMA) Community REDD+ project: Zanzibar

Size: 60,000 ha.

Status: Active/approved.

Description: The project adopts a pro-poor gender-equitable approach to community forest management in Zanzibar. It includes the piloting of carbon financing for REDD+ activities, which provide forest-dependent communities with secure property rights, equitable rewards for providing ecosystem services and other livelihood benefits within the context of the country's national REDD+ strategy. The joint CARE International-HIMA project's central approach is the promotion of decentralized, community forest management. The project is being implemented in 29 community forest sites in seven districts. It covers some 60,000 ha of forest, and will benefit an estimated 16,000 rural households.

Objective: Carbon sequestration or avoided emissions.

Interventions: Afforestation or reforestation, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Names: R. Kapoor, Joelle Chassard and Alicia Montalvo Santamaria. Organizations: (including), CARE International, HIMA, Government of Zanzibar. Email: cpdmhwdp@yahoo.co.in; jchassard@worldbank.org; AMontalvo@mna.es.

REDD+ Yaeda Valley Phase II: Karatu District

Size: 22,000 ha.

Status: In development.

Description: This project expands on the Yaeda Valley Phase I project.

Objective: Carbon sequestration or avoided emissions.

Interventions: Improved forest management, REDD+, sustainable agricultural practices.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Jean-Baptiste Routier. Organization: Wildlife Alliance. Email: jean-baptiste.routier@onf.fr.

REDD+ Yaeda valley: Northern Tanzania

Size: 8,413 ha.

Status: Active/approved.

Description: This project works with hunter-gatherer Hadza and pastoralist communities in Mongo Wa Mono and Domanga villages. The project works in conjunction with traditional leaders, elected village councils, other community members, Carbon Tanzania and the Ujamaa Community Resource Team. The project aims to establish a system of results-based payments for ecosystem services through the sale of ex-post Plan Vivo certificates. This REDD+ project strengthens land tenure, management capacities and local natural resource management, enhances and diversifies local incomes, and contributes to local, national, and global environmental conservation goals.

Avoided deforestation is achieved through a series of interventions, including: (a) reinforcing the implementation of the approved village land use plan and associated village by-laws; (b) improving forest conservation and management activities, and; (c) addressing the primary driver of deforestation, namely slash and burn agriculture. REDD+ means different things to different people. In the context of this project, REDD+ refers to avoiding deforestation and forest degradation while promoting sustainable natural resource use on the part of land users and managers. The project delivers significant socioeconomic co-benefits to participants and surrounding populations and makes a positive biodiversity impact on the broader ecosystem.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: KiJoo Han. Email: kipccf@gmail.com.

Reforestation in the Idete Forest: Southern Highlands

Size: 5,207 ha.

Status: Active/approved.

Description: This proposed afforestation/reforestation clean development mechanism project has been designed for the Idete Forest, located in Mufindi District, Iringa Region. The overall objective of the project is to meet the growing demand for high-quality wood products by establishing well-managed plantation forests while contributing to sustainable environmental management, community development and poverty alleviation.

The species planted include Pinus patula, Pinus elliotii, Eucalyptus calmadulensis, Eucalyptus saligna, and Eucalyptus grandis. A few indigenous species have also been planted for research purposes, including Kaya anthoteca and avocado fruit trees, but those species have failed to thrive and their associated carbon offsets have not been included in certified emissions reductions estimates. The tree species have been screened against a global database of invasive species; although Eucalyptus can be invasive, it is not considered invasive for the purposes of the project because it is managed in accordance with recommended agricultural techniques and is prevented from spreading to other areas.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Name: Isaias Bevilacqua. Email: spvs@spvs.org.br.

Making REDD+ Work: Kilosa District

Size: 50,000 ha.

Status: In development.

Description: This project aims to reduce GHG emissions from deforestation and degradation in ways that provide direct and equitable incentives to communities to conserve and manage forests sustainably. The project will achieve this by supporting the development of a community carbon cooperative hosted within an established network of communities engaged in participatory forest management.

The cooperative will aggregate voluntary emission reductions from its members and market them according to internationally recognized standards. Project funds and carbon market revenue will be channelled directly to the communities on a results-based basis, thereby maximizing incentives to maintain forest cover and reduce deforestation.

The project includes an evaluation and communication component designed to capture lessons learned. The project also focuses on building in-country REDD+ capacity at both local and national governmental levels. This is linked with a strategic advocacy component aimed at forging a smoother path for REDD+ activities within the country. The project will engage members in the formulation of REDD+ frameworks and processes at the national and international levels.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: Wildlife Conservation Society. Email: ssautner@wcs.org; arpels@wcs.org.

Kilimanjaro Water Stewardship Platform, Moshi

Description: The renewable water resources of the Pangani River basin of 1,200 m3 per capita are below the national average of 2,100 m3 and the global benchmarks for water-stressed areas. The basin is already water stressed and will become increasingly constrained through the expansion of commercial water demand, the growth of urban areas (affecting water availability, quantity and quality), the expansion of irrigation (including the continued use of furrow irrigation), and climate change (affecting rainfall patterns and temperature extremes).

The basin is also globally recognized for its forest and biodiversity resources, the preservation of which is a key part of the project. The Pangani basin is home to many commercial agriculture producers and has the largest concentration of horticulture and floriculture producers in the country. These activities present opportunities but they also increase water risks and that means that companies must undertake water stewardship activities. Public authorities at the basin level are becoming more aware of the serious water-related challenges affecting the basin and must work in partnership with companies and water users to address them.

The objective of the Kilimanjaro Water Stewardship Platform is to improve water security and economic prosperity by providing stakeholders, including the Ministry of Water and Irrigation, acting through the Pangani Basin Water Board, with a mechanism to tackle the growing water resource challenges affecting the basin.

Objective: Surface flow restoration/augmentation, improving water quality (reducing pollutants).

Market mechanism: Collective action fund.

Co-benefits: Species/habitat conservation, carbon sequestration, climate change adaptation, community benefits.

Contact information:

Organization: Pangani Basin Water Board.

Sustainable water use in the Usa River subcatchment: Moshi

Description: The Pangani River basin faces pressing water management challenges. Improving agricultural water use efficiency, in particular by smallholder farmers, is key to enhancing water security at the catchment level. This scale of the challenge justifies the need to involve large corporate stakeholders in improving smallholder water efficiency. Furthermore, the Pangani Basin Water Board is currently developing an integrated water resource management plan to provide a strong strategic framework for coordinated action.

A multi-stakeholder partnership could support the Pangani Basin Water Board in coordinating stakeholder activities. In 2016, a group of stakeholders from the public and private sectors and from civil society make a joint commitment to addressing water challenges in the Usa River subcatchment area. The partnership includes the Pangani Basin Water Board, the Upper Kikuletwa Water User Association, the Tanzanian Horticultural Association, Kiliflora Ltd., and the German Agency for International Cooperation (GIZ), acting through the International Water Stewardship Programme. The overall objective of the partnership is to improve water security at the subcatchment level.

Objective: Surface flow restoration/augmentation.

Interventions: Habitat preservation, sustainable agricultural practices.

Market Mechanism: Collective action fund.

Co-benefits: Carbon sequestration, climate change adaptation, community benefits.

Contact Information:

Organizations: Pangani Basin Water Board and International Water Stewardship Programme.

Sustainable water resources management in the upper Ruvuma River subcatchment, Songea

Description: The Ruvuma River is located on the border between Mozambique and the United Republic of Tanzania. Its upper basin in the Southwest of the United Republic of Tanzania is particularly well suited for agriculture. Increasing agricultural production generates important income for the local economy, but leads to increased pressure on natural resources. Approximately 2.4 million people, of whom 1.5 million are in the United Republic of Tanzania, depend on water supplied by the Ruvuma River Basin, as do many industries, including commercial agricultural enterprises.

The objective of the project is to improve water security in the Ruvuma Basin by helping stakeholders to make more efficient use of their water resources and to manage water security challenges more effectively. To achieve those objectives, a multi-stakeholder partnership involving civil society, private sector and governmental stakeholders has been established. The partnership has aligned its work with a dedicated water user association and seeks to engage all stakeholders in the upper Ruvuma River subcatchment.

The partnership supports efforts to certify agricultural plantations, prevent erosion, strengthen infrastructure, improve ecosystems, strengthen governance mechanisms and mobilize funding and support for further action.

Objective: Surface flow restoration/augmentation, improving water quality (reducing pollutants).

Interventions: Avoided forest conversion, habitat restoration/enhancement, habitat preservation.

Market mechanism: Collective action fund.

Co-benefits: Carbon sequestration, climate change adaptation, community benefits.

Contact information:

Organization: Upper Ruvuma Catchment Basin Steering Committee.

Positive Climate Change project

Description: Climate change issues are in the mind of every informed person worldwide due to its observed and expected repercussions. The main causes of global climate change include increased GHG emissions resulting from the burning of fossil fuels, the activities of manufacturing industries, vehicle emissions, the destruction of carbon sinks due to deforestation and an increase in the percentage of the world's land surface under cultivation, land degradation, increasing fertilizer use, and increasing numbers of livestock. Climate change is increasingly threatening the livelihoods of people in the United Republic of Tanzania, and particularly of poor, food-insecure, rural populations with limited access to health care and energy.

The Government is striving to reduce the impact of climate change by promoting improved agricultural practices, including zero tillage, fallow management, the reduced use of nitrogen-based fertilizer inputs, and advanced forest and land use techniques. If climate change results in increased water scarcity, reduced river flow and water storage, this will seriously affect the yields of irrigated crops, including sugarcane and rice, both of which are significant sources of GHG emissions. Cropping systems must be modified in order to address and mitigate the impact of climate change. Furthermore, by reducing GHG emissions, efficient crop management systems can help to advance biodiversity conservation efforts in tropical forests. Conserving biodiversity and the environment will provide ecosystem services, improve livelihoods and promote socioeconomic development.

Objective: Carbon sequestration or avoided emissions.

Interventions: Sustainable agricultural practices.

Market Mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Mpingo Conservation and Development Initiative REDD+ project, Kilwa District

Size: 30000 ha.

Status: In development.

Description: REDD+ and participatory forest management initiatives are key to improving the livelihoods of forest-adjacent communities. The Mpingo Conservation and Development Initiative has extensive experience with participatory forest management in the south-east of the country: communities earn revenue from selling sustainably-harvested timber. The Mpingo Conservation and Development Initiative was awarded the first Forestry Stewardship Council certificate for a community-managed natural forest in Africa. Financial flows from timber are expected to exceed those available from carbon markets in the long term.

In this project, the Mpingo Conservation and Development Initiative is seeking to leverage REDD+ initiatives in order to expand the scale of its participatory forest management initiatives. REDD+ initiatives can generate substantial benefits for poor and natural resource-dependent rural communities. In the south-east of the United Republic of Tanzania, the expansion of agriculture and increasing charcoal production are major long-term threats. Uncontrolled logging is another problem, although loggers tend to target only high-value species so carbon losses are relatively small. The principle current threat to forests is therefore fire. Indeed, some 80 per cent of the landscape burns every year, mostly as a result of wild bush fires late in the dry season when fuel loads are high.

Fires increase tree mortality and impede regeneration. To address that challenge, the Mpingo Conservation and Development Initiative is developing a community fire management programme, which provides for early burning in and around conserved forest areas. Early burning protects forests from hot, late-season fires; early burns are cooler and cause much less damage to forests. It is estimated that taking action to limit fire damage could result in the sequestration of an additional 0.5 mtCO_2e per hectare each year. The project will develop a new voluntary carbon standard methodology to assess progress made in that regard and the Mpingo Conservation and Development Initiative will work with international partners to develop improved methods for measuring carbon stored in miombo woodlands. It will develop efficient participatory assessment and monitoring procedures, drawing on its experience with participatory timber inventories. The project will design protocols for forest monitoring and verification through remote sensing. The resulting protocols will need to be especially sensitive and robust to detect carbon stock changes of between 1 and 2 per cent per year. Monitoring only every three years will make changes easier to detect. Another major component will be the development of best practices for delivering REDD+ benefits to local communities.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market Mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Zambia

Itawa Springs Protection Project: Ndola

Size: 1 ha.

Status: Active/approved.

Description: The Itawa Springs, located in the city of Ndola, is an important tributary to the Kafubu River, which accounts for between 50 and 60 per cent of the water supply for both domestic and industrial use in the cities of Ndola, Luanshya and Masaiti. Many homes, smallholder farmers and brick makers also depend on the Itawa Springs to meet their subsistence needs. Despite its importance, that shared water source is under significant pressure due to land degradation and pollution caused by brick making and unregulated effluent discharge. The year 2012 witnessed the establishment of the Water Futures Partnership, a global strategic alliance involving SABMiller (the Zambian Breweries parent company), the World Wide Fund for Nature and the German Agency for International Cooperation (GIZ). Now, as part of the International Water Stewardship Programme, the multi-stakeholder body has developed and is implementing a comprehensive protection and management plan for the Itawa Springs.

Objective: Unknown.

Interventions: Habitat restoration/enhancement.

Market mechanism: Collective action fund.

Co-benefits: Community benefits, employment and training opportunities.

Contact information:

Organization: International Water Stewardship Programme.

Lusaka Water Security Initiative

Description: the water requirements of the city of Lusaka now exceed the quantities that can be supplied by the Lusaka Water and Sewerage Company and other sources. The increase of borehole drilling is causing aquifer levels to drop further every dry season. Many wells are now dry for several months a year. The situation is worsened by the city's growing population and economic developments on critical groundwater recharge zones, which reduces infiltration during the rainy season. Zambia is also affected by increasingly variable rainfall because of climate change. The city's groundwater is increasingly contaminated with faecal matter, hydrocarbons and other chemicals. Key ecosystems, including the Kafue Flats and Lukanga Swamp, which provide critical water purification and flow regulation services, are also under threat from human and climatic pressures. The Lusaka Water Security Initiative is a multi-stakeholder partnership involving public, private and civil society actors. It provides a platform for dialogue, analysis, planning, coordination and action to improve water security for Lusaka and facilitates the development and implementation of projects to improve water security.

Objective: Groundwater recharge, surface flow restoration/augmentation.

Market mechanism: Collective action fund.

Co-Benefits: Community benefits, employment and training opportunities.

Contact information:

Organization: International Water Stewardship Programme.

Lower Zambezi REDD+ Project: Lower Zambezi National Park

Size: 39,000 ha.

Status: Active/approved.

Description: The Lower Zambezi REDD+ Project is the first pilot REDD+ demonstration project in Zambia. The Project area encompasses approximately 40,000 ha of primary miombo forest directly adjacent to Lower Zambezi National Park, which extends for over 4,000 square kilometers. Known as the Rufunsa Conservancy, the area strategically protects 60 kilometers of the National Park's boundary by providing a buffer zone between the park and densely inhabited areas. Those areas have a growing human population and there is a thriving charcoal trade along the Great East Road, a major thoroughfare from Lusaka to Malawi and Mozambique. The Lower Zambezi National Park forms part of a globally significant transfrontier conservation area that includes Mana Pools National Park in Zimbabwe, a UNESCO World Heritage site and the home of 23,000 elephants – one of the continent's largest populations. The Lower Zambezi National Park also provides valuable habitat for lion, wild dog, and locally-threatened species such as sable, eland, and roan antelope.

Objective: Carbon sequestration or avoided emissions.

Interventions: Avoided forest conversion, REDD+.

Market mechanism: Voluntary offsets and compensation (carbon, water, biodiversity), compensatory mitigation: permittee-responsible offsets.

Contact information:

Organization: BioCarbon Partners. Website: biocarbonpartners.com/impacts/lower-zambezi-redd-project.

Annex 2

A standardized and harmonized greenhouse gas protocol

Congo Basin Climate Commission

A standardized and harmonized greenhouse gas protocol:

a mechanism for aligning greenhouse gas emission accounting, reporting and verification

A guide for programme coordinators, corporations, and communities

Introduction

The proposed standardized and harmonized GHG protocol has been formulated to provide a consistent approach to GHG accounting, reporting, and trading schemes in the Congo Basin Climate Commission subregion. The proposed protocol has been modelled on the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2004). Greenhouse Gas Protocol is an initiative launched by the World Resources Institute and World Business Council for Sustainable Development. The former is an environmental non-governmental organization based in the United States of America, while the latter is a broad coalition of international companies located in Geneva, Switzerland.

The proposed protocol also draws on other compatible and supporting GHG accounting and reporting standards and programmes including:

- The Greenhouse Gas Protocol for Project Accounting (Greenhouse Gas Protocol, 2005);

- The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard: Supplement to the GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2011a);

- The Greenhouse Gas Protocol: Measuring to Manage: A Guide to Designing GHG Accounting and Reporting Programmes (Greenhouse Gas Protocol, 2007).

- International Organization for Standardization (ISO) 14064-1:2018 Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (International Organization for Standardization, 2018);

- International Organization for Standardization (ISO) 14064-2:2019. Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements (International Organization for Standardization, 2019a);

- International Organization for Standardization (ISO) 14064-3:2019. Greenhouse gases – Part 3: Specification with guidance for verification and validation of greenhouse gas statements (International Organization for Standardization, 2019b);

- United Kingdom Department for Environment, Food and Rural Affairs. Guidance on how to measure and report your greenhouse gas emissions (United Kingdom, Department for Environment, Food and Rural Affairs, 2009);

- The Climate Registry: General Reporting Protocol, version 3.0 (The Climate Registry, 2019).

The structure of the proposed standardized and harmonized GHG protocol is based on the aforementioned exemplary GHG protocols but takes into account the specific conditions of the Congo basin. The proposed protocol comprises the following steps:

Step 1. Get started: scope and plan inventory. Start by reviewing accounting standards and methods, determining organizational and operational boundaries, and choosing a base year (Greenhouse Gas Protocol, 2004, chapters 1, 2, 3, 4, 5 and 10):

Phase 1. Adopting GHG accounting and reporting principles;

Phase 2. Setting business goals and inventory design;

Phase 3. Setting organizational boundaries;

Phase 4. Setting operational boundaries;

Phase 5. Setting a base year and tracking emissions over time;

Phase 10. Verification of GHG emissions (initiation).

Step 2. Collect data and quantify GHG emissions (Greenhouse Gas Protocol, 2004, chapter 6):

Phase 6. Identifying and calculating GHG emissions.

Step 3. Develop a GHG inventory management plan to formalize data collection procedures (Greenhouse Gas Protocol, 2004, chapter 7):

Phase 7. Managing inventory quality.

Stage 4. Set a GHG emission reduction target and track and report progress (Greenhouse Gas Protocol, 2004, chapters 8, 9, 10 and 11):

Phase 8. Accounting for GHG reductions;

Phase 9. Reporting GHG emissions;

Phase 10. Verification of GHG emissions (completion);

Phase 11. Setting a GHG target.

The main purpose of the standardized and harmonized GHG protocol is to provide information and facilitate reporting by organizations. It is designed to help organizations understand the emissions that they are responsible for, know how much they are emitting, and which

activities are causing most emissions. Standardized approaches in the proposed protocol will promote consistency and transparency in GHG accounting and reporting among organizations operating in Congo Basin Climate Commission countries. At the same time, it will also help to simplify and reduce costs associated with the preparation and compilation of reports.

Step 1. Get started: scope and plan inventory. Start by reviewing accounting standards and methods, determining organizational and operational boundaries, and choosing a base year (Greenhouse Gas Protocol, 2004, chapters 1, 2, 3, 4, 5 and 10):

- Review GHG accounting standards and methods for organizational reporting;
- Determine organizational and operational boundaries;
- Choose a base year;
- Consider third-party verification.

Phase 1. Adopting greenhouse gas emission accounting and reporting principles

GHG emission accounting principles are similar to those used in financial accounting, namely relevance, completeness, consistency, transparency and accuracy. It is very important that reporting companies agree, realize, and adopt those principles before they begin the accounting exercise.

Relevance	It is important to ensure that the GHG emission reporting of organizations appropriately reflects GHG emissions by those organizations. To strengthen decision-making processes, both within and external to the organization.
Completeness	Striving for completeness strengthens accountability, credibility, and the reporting of all GHG emission sources and activities within the chosen accounting and reporting boundary. Exclusions should be disclosed and justified.
Consistency	The application of consistent and verifiable data and respective methodologies is fundamental. This allows for meaningful comparisons of emissions over time. Changes to the data, reporting boundary, methods or any other relevant factors in the time series should be documented transparently.
Transparency	It is important to address all relevant issues in a factual and coherent manner on the basis of a clear audit trail. Equally important is the disclosure of any relevant assumptions and the accounting and calculation methodologies and data sources used.
Accuracy	Data is only valuable if it is accurate and credible. It is crucial, therefore, for the reporting organization to systematically ensure that GHG emissions are not over- or underestimated. Emissions should be thoroughly justified, and uncertainties reduced to a practical and reasonable level. GHG accounting and reporting should achieve sufficient accuracy to enable users to make decisions with reasonable confidence in the integrity of the reported information.

Phase 2. Setting business goals and inventory design

The standardized and harmonized protocol should be designed as a comprehensive accounting tool that can further a range of business goals, including:

Managing GHG risks and identifying reduction opportunities:

- Identifying risks associated with GHG constraints in the future;
- Identifying cost-effective reduction opportunities;
- Setting GHG targets and measuring and reporting progress.

Public reporting and participation in voluntary GHG programmes:

- Voluntary stakeholder reporting of GHG emissions and progress towards GHG targets;
- Reporting to government and non-governmental organization reporting programmes, including GHG registries;
- Eco-labelling and GHG certification.

Participating in mandatory reporting programmes:

- Participating in government reporting programmes at the national, regional, or local levels.

Participating in GHG markets:

- Supporting internal GHG trading programmes;
- Participating in external cap-and-trade allowance trading programmes;
- Calculating carbon/GHG taxes.

Achieving recognition for early voluntary action:

- Providing information to support "baseline protection" and/or credit for early action.

Phase 3. Setting organizational boundaries

After adopting principles and setting business goals, the next technical step for accounting and reporting is to stipulate the organizational boundary. In this phase, an organization should select an approach for consolidating GHG emissions. Then it should consistently apply the selected approach to define the operations and processes undertaken by that organization. There are three established approaches that can be used to consolidate GHG emissions: the equity share approach, the financial control approach, and the operational control approach:

- Equity share approach: An organization accounts for GHG emissions from operations according to its share of equity in the operation (typically aligned with the ownership percentage);

- Control approach: An organization accounts for 100 per cent of GHG emissions from operations over which it exercises total control. It does not account for GHG emissions from operations in which it owns an interest but has no control. There is a danger that double-counting may occur if two or more organizations hold mutual interests but use different approaches. The control approach can be defined as either financial or operational:

  a) Financial control approach: An organization has financial control over the operations if it can implement financial and operating policies with a view of gaining economic benefits from production activities;

  b) Operational control approach: An organization has operational control over production activity if the organizations or one of its subsidiaries have full authority to introduce and implement its operating policies relevant to specific activities.

Phase 4. Setting operational boundaries

Once an organization has determined its organizational boundaries in terms of its own control, it can then set its operational boundaries, whereby an organization identifies which of its activities are responsible for the release of GHG emissions into the atmosphere. This process involves the identification of emissions associated with its operations, categorizing them as direct or indirect emissions, and choosing the scope of accounting and reporting. Greenhouse Gas Protocol has developed a framework for classifying emissions, whereby corporate emissions are grouped into three broad categories or scopes. A summary of the different types of emission sources under the three scopes is illustrated in Table 11.

Table 11: Illustration of scopes and emissions across the value chain

Scope 1 emissions (direct)	Scope 2 emissions (indirect)	Scope 3 emissions (indirect)
• Company owned vehicles • Fuel combustion	• Purchased electricity for own use	• Production of purchased materials • Product use • Outsourced activities • Contractor-owned vehicles • Waste disposal • Employee business travel

The emissions categorized under the three scopes include:

Scope 1 (direct GHG emissions): direct emissions produced by sources owned or controlled by a company, including vehicles, boilers or furnaces owned by that company. Emissions from chemical production in owned or controlled processes. Direct CO_2 emissions from

the combustion of biomass are not included in Scope 1 but should be reported separately GHG emissions not covered by the UNFCCC/Kyoto Protocol, including chlorofluorocarbons and nitrogen oxide, should not be included in Scope 1 but could be reported separately (Greenhouse Gas Protocol, 2004, chapter 9).

Scope 2 (indirect GHG emissions resulting from electricity generation): emissions resulting from the generation of purchased electricity that is consumed by equipment owned or controlled by a company. Those emissions result from the organization's activities, but they occur at sources that the reporting organization does not own or control. Transmission and distribution losses are considered emissions of the company or organization that controls those transmission and distribution operations.

Scope 3 (other indirect GHG emissions): emissions that are not generated by sources owned or controlled by a company but are emitted as a consequence of the activities of that company. These include all indirect emissions that take place along the supply chain, and emissions resulting, inter alia, from the extraction and production of purchased materials, the transportation of purchased fuels and the use of sold products and services. GHG emissions resulting from the use of leased assets, outsourcing and franchises are candidates for the scope 3 accounting. The protocol proposes that the reporting of scope 3 emissions should be voluntary at the start of a GHG offset programme. Nonetheless, scope 3 accounting should be encouraged. Sectors of the economy with high scope 3 emissions should be given priority attention in that regard.

Phase 5. Setting a base year and tracking emissions over time

In this phase, a base year is established. In phase 5, stakeholders should seek to answer the following questions:

- What is a base year and why it is needed?
- If the emissions change with acquisitions and divestitures, how should those be accounted for?

Establishing a base year for an organization is necessary in order to track that organization's emissions over time. The organization may be restructured over time due to acquisitions, divestments and mergers and may also need to track emissions in response to a variety of business goals, including:

- Public reporting;
- Established GHG targets;
- Managing risks and opportunities;
- Addressing the needs of investors and other stakeholders.

A meaningful and consistent comparison of emissions over time requires a recalculation of historic data. Accordingly, organizations need to choose and report on a base year.

- **Choosing a base year:** The base year should be the earliest year for which verifiable emissions data is available. It can be chosen either as a single year or a multi-year average (the average for the years 2022–2024, for example). The reasons for choosing a particular year need to be specified.

- **Recalculating base year emissions**

  a) Develop a base year recalculation policy: A base year recalculation policy should clearly explain the basis and context for any recalculations. The policy should be applied in a consistent manner. Organizations need to determine and disclose the significance threshold that triggers base year emission recalculations. The verifier should confirm the organization's adherence to the threshold policy. To determine the significance threshold, it is important to consider the cumulative effect of different scenarios on the organization's base year emissions. The recalculation of an organization's emissions data can be done for all years between the base year and the reporting year. Alternatively, the recalculation can be carried out for the previous year alone and the reporting year following a base year recalculation. In some cases, after very large structural changes or mergers, it may be simpler to roll an organization's base year forward to the current reporting year.

  b) Determining whether the base year needs to be recalculated: The following process can be adopted to determine whether an organization needs to recalculate its base year:

     i. Identify any changes that have occurred to the organization in the reporting period that may require a base year recalculation;

     ii. Apply the conditions outlined in table 12 (below) to determine which changes may require a base year recalculation.

Table 12: Basic rules for recalculating base year emissions

Change scenario	Base year recalculation
Mergers, acquisitions and divestitures	
1. Acquisition of (or insourcing) a facility from another organization	
1a. Facility existed in organization's base year	Recalculate organization's base year to include the emissions from the new facility (at the base year level). In respect of insourcing, recalculate organization's base year if the acquired emissions were not included in its base year emissions total and will be included in its current year's total.
1b. Facility did not exist in organization's base year	No base year recalculation is required.
2. Disposal of (or outsourcing) a facility to another company	
2a. The facility existed in organization's base year	Recalculate organization's base year to subtract the emissions from the disposed facility (at the level the emissions were in its base year). In respect of outsourcing, recalculate the organization base year if the outsourced emissions were included in its base year emissions total and will not be included in its current year emissions total.
2b. Facility did not exist in organization's base year	No base year recalculation is required.
3. Transfer of ownership or control of emissions sources. This includes changes in lease status	Increased ownership should be treated in the same way as an acquisition (follow scenario 1a and 1b conditions above). Decreased ownership should be treated in the same way as a disposal (follow scenario 2a and 2b conditions above).
Organic growth and decline	
4. Organic growth: Increase in production output Change in product mix Opening of new plants or operating units owned or controlled by the company	No base year recalculation is required.
5. Organic decline: Decrease in production output Changes in product mix Closing of plants or operating units owned or controlled by the company	No base year recalculation is required.
Changes in quantification methodologies or errors	
6. Changes in emission factors or methodologies (including, for example, a change in activity data) that reflect real changes in emissions (changes in fuel type or technology)	No base year recalculation is required.
7. Changes in measurement methodologies, improvements in the accuracy of emission factors or activity data or the discovery of previous errors or a number of cumulative errors	Recalculate base year emissions to provide consistency with the new approach or to correct errors.

If organizational changes meet the significance threshold, it is important to recalculate the base year. The assumptions made in making base year emission recalculations should be clearly stated.

Phase 10. Verification of GHG emissions (initiation)

GHG accounting verification should provide confidence that GHG emissions reports are complete, accurate, consistent, transparent and without significant errors. Verification is an objective assessment of the accuracy and completeness of the reported GHG information and its compliance with the established GHG accounting and reporting principles.

Selecting a verifier

An appropriate verifier is an individual that has confidence and competence in undertaking GHG verifications and understands calculation methodologies, the relevant industry and the operations of the company or organization in question. Verification of GHG inventories requires a balanced mix of specialized technical and business skills. A verifier must:

- Be independent;
- Be a member of a suitable professional organization;
- Have experience of emissions inventories;
- Understand ISO 14064 and the GHG Protocol Corporate Accounting and Reporting Standard;
- Possess effective internal peer review and quality control skills.

For the completion of phase 10, see Step 4 below.

Step 2. Collect data and quantify GHG emissions (Greenhouse Gas Protocol, 2004, chapter 6):

To accomplish this step the organization must:

- Identify data requirements and appropriate methods for data collection;
- Develop data collection procedures, tools and guidance materials;
- Compile and review facility data (including, for example, data on electricity or natural gas consumption);
- Estimate missing data to fill gaps;

- Choose emissions factors;
- Calculate emissions.

Phase 6. Identifying and calculating GHG emissions

After establishing the organization's boundaries and a base year, the organization must calculate its GHG emissions. GHG emission calculations should identify emission sources, factors, and calculation tools. In this phase, relevant stakeholders must: identify the organization's emission sources; select tools with which the organization's emissions can be calculated, and; determine the data collection activities to be undertaken and identify any data management challenges.

6.1. Calculations and emission factors

To ensure accurate GHG accounting and reporting, organizations must apply appropriate and consistent calculation methods and emission factors. There are five stages in identifying and calculating an organization's emissions:

- Identifying GHG emissions sources;
- Selecting a GHG emissions calculation approach;
- Collecting data and choosing emission factors;
- Applying calculation tools;
- Extrapolating GHG emissions data to corporate level.

Identifying GHG emission sources: Firstly, an organization should identify its direct and/or indirect emission sources in each of its processes, products or services. Typically, GHG emissions occur from the four following sources:

a) Stationary combustion: Combustion of fuels in stationary equipment, including boilers, furnaces, burners, turbines, heaters, incinerators, engines and flares;

b) Mobile combustion: Combustion of fuels in transportation devices, such as automobiles, trucks, buses, trains, airplanes, boats, ships and barges;

c) Process emissions: Emissions from physical or chemical processes include CO_2 emissions from the calcination step in cement manufacturing, CO_2 emissions from catalytic cracking in petrochemical processing, and perfluorocarbon emissions from aluminium smelting;

Fugitive emissions: Intentional and unintentional releases originating, inter alia, from leaks in equipment joints, seals, packaging and gaskets, in addition to fugitive emissions from coal piles, wastewater treatment works, cooling towers and gas processing facilities.

Selecting a GHG emissions calculation approach: A calculation approach must now be selected. The calculation of emissions can be achieved by means of:

a) The direct monitoring of emissions;

b) Calculations based on a mass balance or stoichiometric approach specific to a particular facility or process;

c) The application of documented emission factors.

Direct monitoring may be expensive and difficult to implement. The most common approach for calculating GHG emissions is to apply documented emission factors to known activity data. In general, organizations should use the most accurate calculation approach available that is appropriate for reporting. If it is not possible to calculate emissions from activity data, the organization needs to estimate its emissions by extrapolating known activity data. All methods used must be justified and explained in the reporting document.

Collecting data and choosing emission factors: For most small to medium-sized companies and for many larger companies, scope 1 emissions are calculated on the basis of purchased quantities of commercial fuels using published emission factors. Scope 2 emissions are primarily calculated from metered electricity consumption and supplier-specific, local grid or other published emission factors. Scope 3 activity data, such as fuel use or passenger miles, should apply published or third-party emission factors. In most cases, source-specific or facility-specific emission factors are preferable to more generic or general emission factors if they are available.

Applying calculation tools: The general equation for calculating GHG emissions is shown below:

GHG emissions = (Actual/Estimated Activity Data) * (Emission Factor)

To provide a single measure that embodies all GHGs, it is standard practice to report GHG emissions in metric tons of carbon dioxide equivalent ($mtCO_2e$).

Extrapolating GHG emissions data to corporate level: An organization will need to gather and summarize data from multiple facilities, which may be in different business divisions and countries. The final step in the process of calculating GHG emissions reduces the risk of errors, minimizes reporting burdens and ensures that the information is collected on a consistent basis. A standardized reporting format is recommended to ensure that the data received from different facilities is free of errors and comparable. There are two approaches for gathering data from production facilities:

a) A centralized approach: individual facilities report activity/fuel use data to the corporate level where GHG emissions are calculated;

b) A decentralized approach: individual facilities collect activity/fuel use data, directly calculate their GHG emissions using approved methods and report the emissions data to the corporate level.

There is no significant difference between the two approaches. Their use depends on the location of the emission sources and the quality management procedures adopted. Some common reporting categories for both approaches include:

a) A brief description of emission sources;

b) A list of and justification for the specific exclusion or inclusion of sources;

c) Comparative information from previous years;

d) The reporting period covered;

e) Trends evident in the data;

f) Progress towards business targets;

g) A discussion of uncertainties in the reported emissions data, their likely cause, and recommendations on ways to improve the data;

h) A description of events and changes that have had an impact on reported data, such as acquisitions, divestitures, closures, technology upgrades, or changes to reporting boundaries or calculation methodologies.

In general, reporting organizations should choose the collection approach suited to their specific needs and characteristics. Some may prefer to use a combination of the two approaches to improve accuracy and minimize reporting burdens. However, the two approaches are not mutually exclusive and should produce similar results.

6.2. Common emissions sources and activity data

The following list shows the most common emission sources and the corresponding data to be collected for those sources. This list is not comprehensive but should serve as a starting point for locating the sources that are likely to contribute to an organization's emissions.

Scope 1

- Generation of electricity, heat or steam;
- Physical or chemical processing;
- Transportation of materials, produced goods, waste products and employees;
- Fugitive emissions.

Scope 2

- Purchased electricity/electricity consumption;
- Purchased steam.

Scope 3

- Purchased goods and services (cradle-to-gate emissions);
- Fuel-related and energy-related activities (not included in scope 1 or scope 2);
- Upstream transportation and distribution;
- Waste generated in operations;
- Business travel;
- Employee commuting;
- Upstream leased assets;
- Downstream transportation and distribution;
- Processing of sold products;
- Use of sold products;
- End-of-life treatment of sold products;
- Downstream leased assets;
- Franchises;

- Investments.

6.3. Applying calculation tools

This section provides an overview of GHG calculation tools and available guidance. Organizations are encouraged to use those tools because they have been peer-reviewed by experts and industry leaders and regularly updated. Use of the tools is optional, however, and organizations may use their own GHG calculation methods provided that they are more accurate than those prescribed in the GHG Protocol Corporate Accounting and Reporting Standard or are, at the very least, consistent with those methods.

Typically, large organizations will utilize more than one tool to calculate their GHG emissions. Conversely, small and medium-sized business enterprises tend to use a more centralized and generic tool to report their GHG emissions.

The GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2004) provides all necessary tools and guidance to address both cross-sector and sector-specific emissions:

- Cross-sector tools are applicable to a range of processes, including stationary and mobile combustion;

- Sector-specific tools are designed to calculate emissions in specific fields, such as in aluminium, iron and steel, cement, oil and gas, and pulp and paper production, or in office-based organizations.

Each calculation tool comprises automated worksheets and a guidance document to facilitate the choice of activity data, emission factors and applicable calculation methods, and to facilitate quality control, internal reporting and documentation.

Automated worksheets simplify reporting. By simply inserting activity data and selecting appropriate emission factor(s), an organization can quantify its emissions. Customized emission factors can also be used to replace the default emission factors whenever they are more representative. Most organizations will need to apply more than one calculation tool to cover all their GHG emission sources. For each activity within the chosen scope, it is necessary to:

- Define how the activity can be quantified;

- Collect activity data;

- Look up (or calculate) the emission conversion factors from published sources, governmental guidelines or directly from suppliers (such as the entity supplying electricity);

- Calculate emissions by multiplying activity data by emission factors (emission quantity = activity data x emission factor).

An overview of key GHG calculation tools is available on the Greenhouse Gas Protocol website at: www.ghgprotocol.org/calculation-tools/all-tools. If estimates of relevant figures are made due to a lack of default data, the organization should provide details of the assumptions made in estimating those figures.

Apart from the calculation tools highlighted on the Greenhouse Gas Protocol website, a series of other calculation tools and guidance documents that are based on the approach adopted by Greenhouse Gas Protocol is available. References for other tools or guidelines can also be obtained from the third-party databases. Those references should be used if more information is needed or if the relevant calculation tools are not available on the Greenhouse Gas Protocol website. It should be noted, however, that some of the external data in some sources may not be fully consistent with certain Greenhouse Gas Protocol standards. Those data should thus be reviewed for transparency, completeness and applicability to GHG emissions reporting prior to using the calculation tool. More information of the calculation tools and guidance documents that build on the approach adopted by Greenhouse Gas Protocol is available on the Greenhouse Gas Protocol website. A list of the third-party databases, including those maintained by the United Kingdom Department for Environment, Food and Rural Affairs, the International Energy Agency and IPCC, is also available on that website, available at www.ghgprotocol.org/Third-Party-Databases.

As with any other database, there is always room for improvement as more and more users familiarize themselves with the tools. Indeed, over time, users may become aware of new sources of emissions that should be accounted for using the calculation tools. Users may also develop their own justifications for using a certain calculation tool or emission factor. It is important, therefore, to receive feedback from stakeholders in order to improve the guidelines provided to organizations.

Step 3. Develop a GHG inventory management plan to formalize data collection procedures (aluminium, 2004, chapter 7):

Phase 7. Managing inventory quality

A quality management system provides a systematic process for preventing and correcting errors. It identifies risks and areas where investments are likely to lead to significant improvements in overall inventory quality.

7.1. The five accounting and reporting principles

As highlighted in Step 1, a GHG accounting and reporting system should be based on five key principles, namely relevance, completeness, consistency, transparency and accuracy. Every effort should be made to uphold those principles in the following technical, accounting and reporting steps.

7.2.Ensuring inventory quality

Respect for GHG accounting principles will help strengthen the credibility of the data presented. Quality management should become an integral part of the corporate GHG inventory strategy. Indeed, corporate management should strive to ensure that those principles are upheld at all times during the implementation of that strategy.

The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard provides detailed instructions on how to measure inventory. Those guidelines are applicable to small, medium-sized and large businesses. To report to Congo Basin Climate Commission countries, self-assurance and verification is sufficient as a quality management approach. Reporting entities can be placed in three categories according to the scope of GHG reporting and verification:

First class category:

- Covers all scopes (1, 2 and 3);
- Includes third-party verification or quality assurance;
- Provides reduction targets, strategies and action plans.

Second class category:

- Covers all scopes (1, 2 and 3).
- Includes self-quality assurance or control in place;
- Provides reduction targets, strategies and action plans.

Third class category:

- Covers minimum reporting on scope 1 and 2 emissions;
- Includes self-quality assurance or control in place;
- Provides reduction targets, strategies and action plans.

The three categories will differ in terms of their complexity and reporting costs according to business organizational and operational boundaries (see steps 3 and 4), scales and volumes. The first class category is most demanding in that regard, while the third class category, often appropriate for smaller businesses, is less demanding and provides for limited liabilities.

Step 4. Set a GHG emission reduction target and track and report progress (Greenhouse Gas Protocol, 2004, chapters 8, 9, 10 and 11):

In Step 4, GHG reporting is accomplished:

- Finalize data collection;
- Complete third-party verification (optional);
- Report data as needed;
- Prepare to set a publicly reported GHG target and track progress.

Phase 8. Accounting for GHG reductions

8.1. Quality criteria

Accounting for GHG reductions generates market offsets or credits, which may be traded on carbon emission markets. It is important to pursue actual emissions reductions within the organization. That long-term strategy should maximize in-house emission reductions so that the need for offsets can be gradually reduced.

Offsets represent the reduction, removal or avoidance of GHG emissions from a specific project that is used to compensate (offset) for GHG emissions occurring elsewhere, for example to meet a voluntary GHG target. Organizations should report on emission reduction activities (carbon offsets) that meet the quality criteria. Emission reductions should be transparent. Transparency will help to promote the credibility of emission reduction claims and higher market prices for carbon credits. Offsets must meet six key quality criteria: namely, they should be:

- Real: GHG reductions must represent actual emission reductions quantified using comprehensive accounting methods;
- Additional: GHG credits must demonstrate, that they represent additional reductions compared to the reductions that would have happened in the absence of the offsetting project activities. Offsets quantified using a project versus performance standard methodology may establish slightly different requirements for demonstrating additionality;
- Permanent: The GHG reductions must be permanent and guarantee to replace any losses in the future;
- Transparent: Offsets must be publicly and transparently registered in order to document clearly their generation, transfers, and ownership;

- Verified: GHG reductions must be appropriately validated and verified according to approved standard. The standard must ensure reproducible results. The verifier must be accredited by a viable and trustworthy accreditation system;

- Owned unambiguously: No parties other than the project developer must be able to reasonably claim ownership of the GHG reductions.

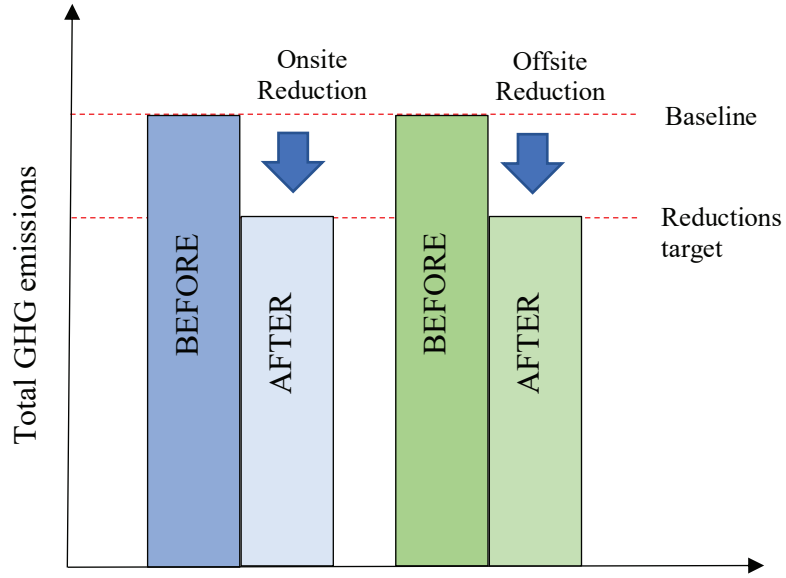
Organizations that disclose offset purchases as additional information and are not applying those offsets to their GHG reporting are not required to demonstrate conformance with quality criteria. Offsets must be reported separately from emissions totals and can be disclosed as a GHG management practice for scope 1, scope 2 or scope 3 emissions. Only the purchased carbon credits applicable to the reporting year are to be reported.

8.2. Project based reductions and offsets/credits

Project reductions can be used as offsets. For this purpose, they should be qualified using a project quantification method. An appropriate method is described in detail in the GHG Protocol for Project Accounting (Greenhouse Gas Protocol, 2005). That Protocol provides the following methodology for accounting for GHG reductions:

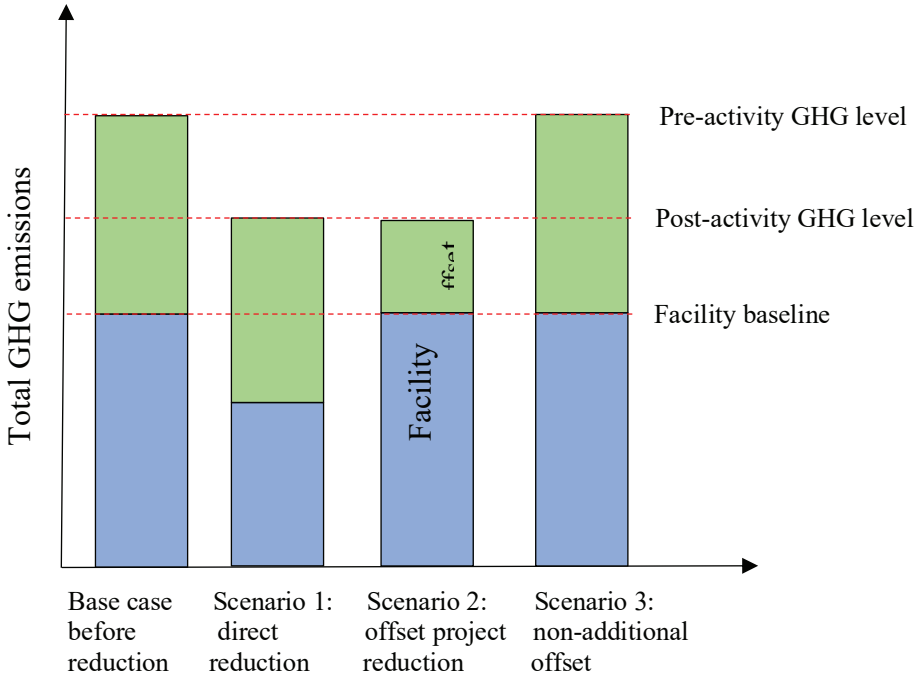
- Select a baseline scenario for emissions: A baseline is a core component of the GHG reduction quantification process. It must be established to quantify GHG reductions. The baseline makes assumptions about GHG emission levels in the absence of the GHG reduction project in question. Credible GHG emission reductions can only be assessed if the baseline is an accurate and realistic reflection of the business-as-usual emissions scenario (The Climate Trust, 2007). It should be noted that baseline emissions are hypothetical and there is often considerable uncertainty as to their accuracy. As illustrate in figure 12, the GHG reductions achieved are then equivalent to the difference between the real and baseline hypothetical emission reductions.

Figure 12: Real and baseline hypothetical reductions



- Demonstrate an additionality: Additionality is an essential determinant of the effectiveness of an offset project and one of the most important factors in assessing project quality. Additionality is a policy term by which an assessment is made regarding whether or not a project's emission reductions are in addition to a business-as-usual scenario. A project proponent must demonstrate that it faces barriers to the project implementation that can be addressed through additional funding. Those barriers can be institutional, technological or financial. Additionality demonstrates that project activities bring about real and measurable reductions in atmospheric GHG levels. A non-additional offset project would not reduce the amount of GHGs in the atmosphere. This is illustrated in figure 13.

Figure 13: Additionality and baseline scenarios



- Identify and quantify relevant secondary effects: Climatic projects may have side effects and emission changes not captured in the primary project achievements. Secondary GHG effects are normally unintended and are relatively small consequences of a project, including leakage. Leakage is defined as increases or decreases in GHG emissions outside the project's emissions boundary that occur because of the project activity. For example, if a farm decides to cease farming operations to reforest its land, another area of land may be deforested to meet the demand for the farmer's crop. Monitoring and verification plans should provide necessary mechanisms to properly account for leakage over the life of an offset project.

- Consider reversibility: Reversibility of reductions may occur when reductions are temporary, or when removed or stored carbon returns to the atmosphere at some point in the future. This may happen intentionally or unintentionally, for example as a result of forest harvesting or fires. The project should assess the risk of reversibility and formulate reasonable measures to mitigate that risk.

- Avoid double counting: In the context of climate change mitigation, double counting represents a situation in which a single GHG emission reduction or removal is used more than once to demonstrate compliance with mitigation targets. Double counting may occur where multiple mitigation mechanisms overlap and emission reductions are transferred among entities. Such double counting may take the following forms:

    a. Double claiming, where two or more parties claim the same emission reduction to comply with their mitigation targets as formulated in their nationally determined contributions to the global response to climate change;

b. Double issuance, whereby more than one emission reduction unit is registered for the same mitigation benefit under different mitigation mechanisms, such as a sustainable development mechanism and a nationally determined contribution.

Other forms of double counting, such as double purpose, double finance, or double use are also known but less relevant to the GHG accounting process.

Phase 9. Reporting GHG emissions

GHG reporting concerns the presentation of GHG data in formats tailored to the needs of various reporting uses and users. Reported information must comply with a number of key principles and be relevant, complete, consistent, transparent, and accurate. The standard reporting framework includes three components:

Description of the organization and the reporting boundary:

- The reporting period covered;
- General organizational information;
- Organizational boundaries, including the selected operational boundaries;
- Any specific exclusions under the three emission scopes, along with justifications for those exclusions.

Information on emissions:

- Scope 1, 2 and 3 emissions data;
- Emissions data for each scope disaggregated by source type;
- Emissions data for all UNFCCC/ Kyoto Protocol GHGs, provided separately in metric tons of CO_2 equivalent;
- Emissions data for direct CO_2 emissions from sequestered carbon;
- Year chosen as the base year;
- Appropriate context for any significant emissions changes that trigger base year emissions recalculation (acquisitions and divestitures, outsourcing and insourcing, changes in reporting boundaries or calculation methodologies, etc.);
- Base year emissions data;

- Methodologies used to calculate and measure emissions, providing clear references;
- An outline of any consultancy services used in report preparation;
- An outline of any assurances provided and a copy of any verification statement regarding the reported emissions, if applicable.
- An outline of any GHG emissions reduction target, strategies, and action plans;
- Information on offsets;
- Reporting information declaration.

Optional information

- A description of performance measured against internal and external benchmarks;
- Information on the causes of emission changes that did not trigger a base year emissions recalculation;
- GHG emissions data for all years between the base year and the reporting year;
- Information on the quality of the report, uncertainties, and an outline of policies in place to improve reporting quality;
- Information on other carbon reduction initiatives.

The GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2004) requires the reporting of at least scope 1 and scope 2 emissions. Scope 3 emissions reporting is welcome but optional.

Phase 10. Verification of GHG emissions (completion)

Currently, there is no mandatory requirement for organizations to obtain any assurance of the accuracy of emissions data. The information reported by organizations should, nevertheless, be verifiable. Any information that would allow verification of GHG emissions by a governmental authority or another third party should be retained.

10.1. Selecting a verifier (see Stage 1)

10.2. Verification goals

An organization should clearly define its goals and decide whether external verification is required before planning an independent verification. Verification aims to provide a sense of

confidence and reliability that the information reported provides an accurate, correct and fair account of a company's GHG emissions. There are several goals for undertaking an external verification. These include:

- To comply with voluntary or mandatory requirements;
- To bolster the credibility of publicly-reported information and reduction goals;
- To enhance stakeholder trust in the reporting organization;
- To increase management confidence in reported information;
- To improve internal GHG accounting and reporting practices;
- To facilitate learning and knowledge transfer within the organization;
- To meet or anticipate the requirements of future trading programmes.

For organizations that are interested in improving the quality of their GHG inventories but do not wish to engage the services of an external verifier, an internal verification can be conducted by independent personnel who are not associated with the GHG accounting and reporting process. Both internal and external verification should follow similar procedures and processes.

10.3. Verification process

To comply with ISO 14064-3, the key steps that must be taken in order to conduct a verification exercise include the following:

- Agreeing with the verifier on the verification objectives, scope, criteria, and level of assurance;
- Developing an appropriate sampling plan and verification approach;
- Assessing GHG data and information controls;
- Evaluating GHG data against predetermined performance criteria or requirements;
- Completing a written verification statement or conclusion.

Third-party verification is encouraged but not required at the present time. Site visits may need to be conducted by verifiers in order to obtain appropriate information so as to enable them to attest to the completeness, accuracy and reliability of the information reported. Site visits may, however, only be necessary if a high level of assurance is required from the verification.

An external verifier can be engaged at any time during the GHG preparation and reporting process. Some organizations, may instead choose to develop a semi-permanent internal verification team.

An organization may be required to correct any material errors that have been identified during the verification process before the verifiers can approve the GHG report.

Overall, whether the verification is undertaken for the purpose of an internal review, public reporting or compliance with a particular GHG programme, the verification process provides valuable input in a process of ongoing improvement within an organization.

Phase 11. Setting a GHG target

Setting an emissions reduction target is the logical next step once an organization has measured and calculated its GHG emissions. Common drivers for setting GHG targets include:

- Minimizing and managing GHG risks;
- Reducing operational costs and fostering innovation;
- Preparing for the adoption of new or amended regulations;
- Demonstrating leadership and corporate social responsibility;
- Participating in voluntary or mandatory programmes.

When setting targets, organizations should consider whether those targets should be:

- Organization-wide;
- Inclusive of all emissions that the organization measures and reports on (scopes 1, 2 and 3);
- Based on the most recent base year for which data are available, or;
    - Based on progress achieved in the previous 5 to 10 years.

11.1. Setting a GHG target

To set a GHG target, an organization should:

- Obtain a commitment from senior management to set a GHG emission reduction target. Engaging senior management, particularly at the management board and chief executive officer levels is necessary in order to:

a) Establish an internal accountability mechanism to facilitate the achievement of the target;

b) Create an incentive system;

c) Mobilize adequate resources to achieve the target.

- Decide on the target type. There are two types of emissions reduction targets that organizations can adopt, namely absolute-based and intensity-based targets. Each type has advantages and disadvantages:

a) An absolute target is expressed in terms of a reduction over time in a specified quantify of GHG emissions into the atmosphere (usually in $mtCO_2e$);

b) An intensity target is expressed as a reduction in the ratio of GHG emissions relative to another business metric (for example, $mtCO_2e$ per ton of product, kilowatt or ton-mileage) or some other metric such as sales, revenues or office space.

- Decide on the target boundary. The target boundary defines the GHGs, geographic operations, sources and activities that are covered by the target. The target and the organization's GHG emissions reporting boundary may be identical, or the target may only cover specific sources identified in the GHG emissions reporting process. When deciding on the target boundary, the quality of the emissions data in the GHG reporting process should be the key factor.

- Choose the target base year. There are two general approaches to setting the base year:

a) Using a fixed target base year. Most targets are defined against a fixed target base year, which is usually the most current year for which data is available;

b) Using a rolling target base year. Organizations roll forward their base year at regular intervals, usually by one year, so that emissions are always compared to the previous year.

It is important to ensure that the emissions data for the target base year is reliable and verifiable.

- Define the target period of time. Organizations can meet their GHG targets either by reducing emissions within their own operations and supply chains or by purchasing credits from emission reduction projects (carbon offsets). In general, organizations should prioritize efforts to reduce emissions within their own operations and supply chains.

- Decide on the target level. In determining the target levels that should be set, organizations should consider the key drivers affecting GHG emissions by looking at:

a) The relationship between GHG emissions and other business metrics, such as the number of employees, sales or revenue;

b) Emissions projections from a range of reduction strategies;

c) Existing initiatives or business targets that will affect GHG emissions, such as capital investments, product/service changes, or environmental or energy plans;

d) The future of the organization as it relates to GHG emissions, factoring in growth factors such as new production plans;

e) Benchmarking with similar organizations.

- Track and report progress against the target. In order to check compliance and to maintain credibility, organizations should carry out regular performance checks to track performance against the established target. An interim target for that purpose may facilitate efforts to track performance. A rolling target base year will automatically include interim targets every year.

Conclusion

The proposed standardized and harmonized protocol is based on a number of key global standards, including those developed by Greenhouse Gas Protocol and the International Organization for Standardization, and on climate-related best practices in Congo Basin Climate Commission countries. There are more than 50 GHG offset projects currently in operation or planned in Congo Basin Climate Commission Member States, which have made good progress towards the development of robust carbon offsetting markets. It is important to note, however, that those offsetting projects make use of a range of protocols, methodologies, and guidance from different stakeholders in different carbon markets and the Congo Basin Climate Commission subregion would benefit greatly from the development of its own GHG offset programme, which should include the proposed standardized and harmonized GHG protocol and its own registry for offset project registration. That programme could be launched under the auspices of the secretariat of the Congo Basin Climate Commission, in collaboration with ECA and the UNFCCC secretariat. The programme should be recognized as a key instrument for advancing climate projects in the Congo basin and the wider African region. The development of the proposed standardized and harmonized protocol is a major step in efforts to establish a continental offsetting programme. The next step would be to establish a dedicated GHG offset registry.

The standardized and harmonized protocol is a general framework for all offsetting projects in the region. It sets out a methodology and guidelines that are applicable to all organizations of

all sizes and in all jurisdictions in order to ensure the consistency, quality, and comparability of GHG inventories and carbon credits. The protocol should be used by all sectors of the economy, for which further adoption and specification will be necessary. In addition, four supplemental sectoral outlooks have been developed for sectors that are of particular importance in the Congo Basin Climate Commission subregion. Those sectors are: (a) improved forest management (annex 2a); (b) energy efficiency/cleaner cookers/efficient cookstoves (annex 2b); (c) agricultural soil enrichment (annex 2c); and (d) rice cultivation (Annex 2d). The reporting template that should be used to report project results under the standardized and harmonized protocol and the four supplemental sectoral outlooks are set out in the annexes to the present report.

Annex 2a

Supplemental sectoral outlook: improved forest management

Congo Basin Climate Commission

Improved forest management

A supplemental sectoral outlook to complement the proposed standardized and harmonized greenhouse gas protocol: greenhouse gas emission accounting, reporting and verification

Background

An improved forest management project presumes that the management of a mature wood forest will maintain or increase the amount of carbon sequestered compared to the baseline scenario. An improved forest management project provides for forest measures that improve key forest structure characteristics and increase the amount of wood it contains. The forest should be permanently dedicated to forest use. Forest managers should, inter alia:

- Submit a statement that easement is perpetual;
- Submit a certified wood management plan;
- Establish an annual allowable cut to ensure ongoing carbon sequestration;
- Identify conditions that would allow forest harvesting as a forestry measure to restore safety and resilience following forest calamities and disturbances;
- Allow for conditions for salvage wood harvesting following natural disturbances;
- Foresee reforestation of the project site in case of loss as a result of natural calamities of over 50 per cent live and dead tree canopy on over 10 per cent of the total project area. Promote reforestation through active planting, natural regeneration, or passive management. Include monitoring to ensure timely forest site recovery;
- Prohibit deep harvesting of more than 1 per cent of the project area annually;
- Prescribe measures to be taken in the case of any violations of the terms of the forest management contract and ensure restoration of the forest to the conditions existing prior to those violations.

This supplemental sectoral outlook on improved forest management has been formulated to complement the proposed standardized and harmonized GHG protocol in the light of the substantial specificity of the forestry sector. It provides guidance on how to account and report GHG emission reductions associated with forest management improvements. The methodology specifies eligibility rules, methods for forecasting and calculating reductions, performance-monitoring instructions, and procedures for reporting project information to verifiers. Project proponents initiating an improved forest management project should refer to this document in conjunction with the proposed standardized and harmonized GHG protocol for methodological support and clarifications regarding subject specificities. This supplemental outlook is designed to ensure the complete, consistent, transparent, accurate, and conservative quantification and confirmation of GHG emission reductions associated with improved GHG sequestration through improved forest management projects. The project should provide for deliberations on the following:

- An estimation of the capacity, structure and dynamism of the improved forest management project market. The project should only encourage GHG reductions that are cost-effective under current and foreseeable market conditions;

- The move towards sustainable development. It is important to clarify how project activities will align with the Sustainable Development Goals, including those Goals relevant to non-GHG benefits that are not addressed in the proposed standardized and harmonized GHG protocol;

- A rationale for pursuing a specific scheme of offset credits and pricing policy. In that regard, it should be noted that many non-governmental organizations claim credits without providing sufficient evidence for the associated GHG emission reductions;

- A rationale for the implementation of the proposed protocol in Congo Basin Climate Commission countries or the wider region:

a) A harmonized market in the subregion that will inform carbon markets across the continent, including within the context of the African Continental Free Trade Area,

b) Market integrity,

c) Public/private investment stimulation,

d) Other possible benefits.

Phase of the project

Indicate whether the project is in the planning or development phase

Ownership and overview of the organization/firm/corporation

A forest owner (an individual, corporation or multiple forest owners) must have legal authority to manage carbon storage in the project area via timber or land-use rights. Holders of mineral, gas, oil, or similar de minimis rights, including residential rights, without interest in timber, are excluded from the definition of forest owners.

An improved forest management offset project initiator must be a forest owner. A conservation easement placed on the project area will constrain the scope of action that can be taken by a new owner or manager if there is a change in forest ownership.

Project area

Describe the geographic boundaries of the project area in detail and present a map or maps that display major public and private roads, watercourses, topography and towns, in addition

to the latitude and longitude of all key features. Maps must be at an appropriate resolution for all those features to be clearly displayed.

Non-forest areas, including brush and rocks, or areas not under forest management, should be excluded from the project area. The project area may be continuous or separated into tracts or distinct polygons. Calculate the project area using geographical information system tools. Include the project area in the project documentation.

Project eligibility

Project eligibility criteria include a summary of:

- Existing canopy cover (over 10 per cent for at least 20 years);
- Any legal constraints that may limit the scope of forest management;
- The use of fertilizers by the project;
- The percentage of native/alien species relative to the sum of carbon in the standing live carbon pool (basal area per hectare), which should not be below a 95 per cent threshold;
- Project area composition: mixed species distribution, prevalence of single species (as a percentage of the basal area), value of live forest stands;
- Watershed scale (up to 4,000 ha).
- The potential of the project to maintain and contribute towards carbon sequestration in areas of forest under 20 years of age (not to exceed 40 per cent of the project area);
- Measures used in the project to ensure that structural elements, namely standing and lying dead wood, remain of sufficient quality during the life of the project. Measures may include monitoring the amount of dead wood across the project area, and monitoring the amount of dead wood in harvested areas;
- The rationale for project implementation, such as legal compliance/obligations, court orders or legally-binding orders by the authorities;
- The submission history of the project, indicating the registries/programmes to which the project documents have been submitted, and any pre-approval, approval, or other relevant documents;
- Any prior registrations or claims of GHG reductions associated with the project;

- Any prior sales of GHG reduction credits from the project to third parties (as claimed in other registries or programmes).

- The proposed project methodology, including the standardized inventory methodology, default baseline and any other toolkits that may be used.

- Additional conditions may include:

- A summary of the main activities to be undertaken as part of the project, including managing older forests, the retention or harvesting of certain trees, avoiding damage to retired trees at harvest;

- A summary of on-site stocks and improved forest management scenarios outlining how those stocks will be managed;

- Potential baseline scenarios that can be used to ascertain the impact of project activities, or a standardized baseline.

There are three main carbon credit conditions for improved forest management offset projects:

- Avoided emissions over 10 years to 90–100 years (minimum), to be determined according to submitted monitoring, reporting and verification plans;

- Enhanced sequestration over 10 years to 90–100 years (minimum), to be achieved through improving forest carbon stocks, the retention of trees, the extension of rotation areas and reductions in non-forest areas, including roads;

- Enhanced wood productivity over 10 years to 90–100 years (minimum) compared with the baseline, including improved productivity pursuant to the implementation of an improved forest management offset programme.

Leakage

Leakage in the context of improved forest management offset projects refers to the shifting of harvesting activities to areas outside the project area. Determine the ongoing risk of potential leakage through periodic monitoring, reporting, and verification of harvested wood products. Key solutions to avoid leakage include:

- Commutative analysis based on periodic monitoring, reporting and verification of harvested wood products;

- Annual project evaluation including through comparisons of cumulative project harvests to date with the standardized cumulative harvest baseline over the 100 years (minimum) established as the life of the project.

As is the case in the standardized baseline analysis, leakage is assessed as a risk over the 100-year life of the project. Evaluate the project annually for evidence of potential leakage by comparing the cumulative project harvest to date with the standardized cumulative harvest baseline. The evaluation of the cumulative harvest to date is the basis for determining the leakage risk and the related deduction. There are three key criteria that should be considered in order to determine the probability of leakage:

- If project harvesting is below baseline harvesting: the risk of leakage is high. Harvest leakage risk is 20 per cent of the difference in harvest (includes harvest effects on standing trees in the forest). Market effects leakage risk is 80 per cent of the difference in wood products alone;

- If project harvesting is equivalent to baseline harvesting: there is no risk of leakage;

- If project harvesting exceeds baseline harvesting: there is no risk of leakage. Instead, there may be a positive offset of previous contributions to the leakage deduction pool.

Greenhouse gas assessment boundary

The GHG assessment boundary encompasses all GHG sources, sinks and reservoirs that may be significantly affected by improved forest management project activities, including forest carbon stocks, sources of biological CO_2 emissions and mobile combustion GHG emissions. Define all GHG sources, sinks and reservoirs to determine the net change caused by the improved forest management project.

The sources, sinks and reservoirs within the assessment boundary should be placed in two categories, namely primary and secondary effects. Primary effects are caused by intended changes in carbon stocks, GHG emissions or removals. Secondary effects are induced by unintended changes in carbon stocks, GHG emissions or removals caused by improved forest management practices. Secondary effects may include increases in mobile combustion CO_2 emissions associated with site preparation, as well as increased CO_2 emissions caused by the shifting of harvesting activities from the project area to other forest lands (leakage). Projects are required to account for secondary effects using the methodology prescribed in the proposed standardized and harmonized GHG protocol.

The list below provides a comprehensive description of GHG sources, sinks and reservoirs that might be affected by the improved forest management project:

- Standing live carbon (carbon in all portions of living trees);

- Shrubs and herbaceous understory carbon;

- Standing dead carbon (carbon in all portions of dead standing trees);

- Lying dead wood carbon;
- Litter and duff carbon (carbon in dead plant material);
- Soil carbon;
- Carbon in in-use forest products;
- Forest product carbon in landfills;
- Biological emissions from site preparation activities;
- Mobile combustion emissions from site preparation activities;
- Mobile combustion emissions from ongoing project operation and maintenance;
- Stationary combustion emissions from ongoing project operation and maintenance;
- Biological emissions from the clearing of forest land outside the project area;
- Biological emissions/removals from changes in harvesting on forest land outside the project area;
- Combustion emissions from the production, transportation and disposal of forest products;
- Combustion emissions from the production, transportation and disposal of alternative materials to forest products;
- Biological emissions from the decomposition of forest products.

Quantifying greenhouse gas emission reductions

It is recommended that GHG emissions should be quantified by implementing the following seven steps:

1. Estimating baseline onsite carbon stocks;
2. Estimating baseline carbon in harvested wood products;
3. Forecasting onsite project carbon stocks;
4. Forecasting project carbon in harvested wood products;

5. Calculating the project's primary effect;

6. Quantifying the project's secondary effects;

7. Calculating total net GHG reductions and removals.

Reporting principles and rules

Submit the project implementation report to the relevant Congo Basin Climate Commission body, including the completed project template and accompanying documentation. Keep in mind that the project documentation will be made publicly available through its inclusion in the respective registry. Project information should be kept for a period of seven years after it is generated, or for the entire project crediting period, whichever is greater. Records should be kept in both hard copy and electronic formats.

Verification

Submit the project monitoring report, including the completed project template and accompanying documents. The report should be verified by a certification body approved by the Congo Basin Climate Commission at the conclusion of the crediting period. Facilitate a site visit by the certifier as part of the ex-post verification process. At that stage, guidance should be sought from the certification body.

Annex 2b

Supplemental sectoral outlook: energy efficiency/ cleaner cookers/efficient cookstoves

Congo Basin Climate Commission

Energy efficiency/cleaner cookers/efficient cookstoves

A supplemental sectoral outlook to complement the proposed standardized and harmonized greenhouse gas protocol: greenhouse gas emission accounting, reporting and verification

Background

The energy efficiency/cleaner cookers/efficient cookstoves supplemental sectoral outlook has been formulated to complement the proposed standardized and harmonized GHG protocol in the light of the impact of that sector on emissions. It provides guidance on how to account and report GHG emission reductions associated with energy efficiency improvements made by replacing traditional cooking stoves with project-eligible efficient equipment. The methodology set out in the present sectoral outlook specifies eligibility rules, methods for forecasting and calculating reductions, performance-monitoring instructions, and procedures for reporting project information to verifiers. Project proponents initiating improved cookstove projects should refer to this document in conjunction with the proposed standardized and harmonized GHG protocol for methodological support and clarifications regarding subject specificities. This supplemental outlook is designed to ensure the complete, consistent, transparent, accurate and conservative quantification of GHG emission reductions associated with improved cookstove projects. The project should provide for deliberations on the following:

- An estimation of the capacity, structure and dynamism of the energy market. The project should only encourage GHG reductions that are cost-effective under current and foreseeable market conditions;

- The move towards sustainable development. It is important to clarify how project activities will align with the Sustainable Development Goals, including those Goals relevant to non-GHG benefits that are not addressed in the proposed standardized and harmonized GHG protocol;

- A rationale for pursuing a specific scheme of offset credits and pricing policy.

- A rationale for the implementation of the proposed protocol in Congo Basin Climate Commission countries or the wider region:

a) A harmonized market in the subregion that will inform carbon markets across the continent, including within the context of the African Continental Free Trade Area,

b) Market integrity,

c) Public/private investment stimulation,

d) Other possible benefits.

Phase of the project

Indicate whether the project is in the planning or development phase.

Project eligibility

Location and documentation: only Congo Basin Climate Commission countries are eligible for project activities. Project initiators may, however, propose the inclusion of other African countries and additions to the GHG protocol methodological parameters. The addition of additional countries must, however, be approved by the Congo Basin Climate Commission secretariat and documented in the standardized and harmonized GHG protocol methodology before projects in those countries can be considered eligible.

Start date: 12 months after batch installation. The crediting period should span over the expected useful life of the equipment.

Additionality: ensure compliance with performance standards (tests/methods used), and with regulatory and legal requirements (tests).

Environmental and social safeguards: ensure that project implementation will result in positive environmental and social impacts. Confirm that no negative environmental, economic or social impacts are anticipated. The proposed standardized and harmonized protocol facilitates the reporting of any non-GHG benefits upstream or downstream of the project site. The protocol also welcomes any positive impact of projects in terms of accelerating the achievement of the Sustainable Development Goals that is not explicitly mentioned in the protocol methodology.

Ownership and double counting: credits are to be received only from one programme if GHG boundaries of multiple programmes or projects overlap.

Project resilience metrics: demonstrate that adequate measures have been adopted to ensure an ongoing impact during the offsetting period and following completion of the project. Present information disclosure to project participants and communities including the type of cookers used, how they should be used during the crediting period, where users can seek assistance, support and suppliers, and where they can obtain spare parts and technical services.

Market expansion plans: provide details of plans for carbon offsetting market expansion, particularly into areas where current GHG crediting incentives have met with limited success. Provide a rationale for that expansion and actions to achieve further emission reductions.

Ex ante sustainability tests used for crediting: provide evidence for the complete, consistent, transparent, accurate, and conservative estimation of emission reductions resulting from project activities. Provide adequate safeguards to ensure that emission reductions are achieved over the lifetime of the project and beyond.

Greenhouse gas assessment boundary

Delineate the GHG sources, sinks and reservoirs that must be assessed to determinate the net change in emissions resulting from the energy efficient cookstove project, in accordance with ISO 14064:

- Combustion of non-renewable biomass for cooking fuel using biomass-fired cookers: establish project baseline;

- Procurement of non-renewable biomass for cooking fuel using biomass-fired cookers: establish project baseline;

- Procurement of energy efficient cookstoves: discount emissions linked to manufacturing and end-of-life management of the cookstoves.

Quantifying greenhouse gas emission reductions

Calculate the change in efficiency that occurs following the shift from the baseline to the project scenarios, including reductions in the amount of woody biomass consumed and the associated reductions in GHG emissions. GHG emission reductions must be quantified and confirmed for credits to be granted.

Make use of appropriate mathematical equations, as set out in relevant literature, or formulate an appropriate equation in collaboration with trained and experienced chemical physicists, physical chemists, physicists and engineers. Ensure that total emission reductions equal the sum of emission reductions by specific project equipment batches and periods.

Estimating performance decline

Estimate the expected decrease in efficiency during the crediting period by means of an appropriate equation.

Estimating the abandonment rate

Take into account the fact that some project cookstove users are likely to stop using those stoves and revert to traditional cooking methods during the crediting period. Provide a conservative estimate of the proportion of users who are likely to discontinue using the project stoves using an appropriate equation, in accordance with the proposed standardized and harmonized GHG protocol.

Leakage

Project emission reductions may lead to an increase in emissions outside the project area. Those increases may, for example, occur when inefficient cookstoves are removed from the project area following the launch of project activities. In such cases, apply the standard net to gross adjustment reduction factor (NTGleakage) to assess leakage. Determine the specific parameter value prior to project submission in accordance with the supporting literature provided in the context of the proposed standardized and harmonized protocol.

Reporting principles and rules

Submit the project implementation report to the relevant Congo Basin Climate Commission body, including the completed project template and accompanying documentation. Keep in mind that the project documentation will be made publicly available through its inclusion in the respective registry. Project information should be kept for a period of seven years after it is generated, or for the entire project crediting period, whichever is greater. Records should be kept in both hard copy and electronic formats.

Verification guidance

Submit the project monitoring report, including the completed project template and accompanying documents. The report should be verified by a certification body approved by the Congo Basin Climate Commission at the conclusion of the crediting period. Facilitate a site visit by the certifier as part of the ex-post verification process. At that stage, guidance should be sought from the certification body.

Annex 2c

Supplemental sectoral outlook: agricultural soil enrichment

Congo Basin Climate Commission

Agricultural soil enrichment

A supplemental sectoral outlook to complement the proposed standardized and harmonized greenhouse gas protocol: greenhouse gas emission accounting, reporting and verification

Background

Agricultural soil can emit and sequester CO_2, the primary greenhouse gas responsible for human-caused climate change. Annual and perennial plants, through the process of photosynthesis, naturally absorb CO_2 from the atmosphere and store the carbon in the biomass. As plants grow and respire, some of this carbon is deposited in the soil as root exudates. After plants die and regrow, some of this carbon is also deposited in the soil. This carbon cycling occurs throughout the year, with positive and negative fluxes over time depending on soil and climatic conditions, management practices, and other variables.

Globally, agriculture, forestry, and other land use sectors contribute up to 24 per cent of total GHG emissions. Through sustainable management and protection, agricultural lands can play a positive and significant role in addressing global climate change.

An agricultural soil carbon project is defined as the adoption of agricultural management practices that are intended to increase soil organic carbon storage and/or decrease net emissions of CO_2, CH_4 and N_2O from agricultural operations, as compared to the baseline.

This agricultural soil enrichment supplemental sectoral outlook has been formulated to complement the proposed standardized and harmonized GHG protocol in the light of the particular impact of that sector on emissions. It provides guidance on how to account and report GHG emission reductions associated with agricultural soil. The methodology set out in the present sectoral outlook specifies eligibility rules, methods for forecasting and calculating reductions, performance-monitoring instructions, and procedures for reporting project information to verifiers. Project proponents initiating soil enrichment projects should refer to this document in conjunction with the proposed standardized and harmonized GHG protocol for methodological support and clarifications regarding subject specificities. This supplemental outlook is designed to ensure the complete, consistent, transparent, accurate and conservative quantification of GHG emission reductions associated with agricultural soil enrichment projects. The project should provide for deliberations on the following:

- An estimation of the capacity, structure and dynamism of the soil enrichment projects market. The project should only encourage GHG reductions that are cost-effective under current and foreseeable market conditions;

- The move towards sustainable development. It is important to clarify how project activities will align with the Sustainable Development Goals, including those Goals relevant to non-GHG benefits that are not addressed in the proposed standardized and harmonized GHG protocol;

- A rationale for pursuing a specific scheme of offset credits and pricing policy.

- A rationale for the implementation of the proposed protocol in Congo Basin Climate Commission countries or the wider region:

a) A harmonized market in the subregion that will inform carbon markets across the continent, including within the context of the African Continental Free Trade Area,

b) Market integrity,

c) Public/private investment,

d) Other potential benefits.

Phase of the project

Indicate whether the project is in the planning or development phase.

Project ownership

Soil enrichment projects will generally involve several parties, including landowners, field managers, project developers, project owners and aggregators. Any of those stakeholders could be the project owner of a particular project. A project developer may be a contracted third party. When the project is validated, the project owner must attest that no other entities are reporting or claiming the GHG reductions caused by the project.

Every soil enrichment project must have a single project owner. The project owner must exercise clear ownership of the project's GHG reductions during the entire period covered by the project agreement. The project owner will be personally and solely responsible for the accuracy and completeness of all submitted information. The project owner should ensure compliance with the proposed standardized and harmonized protocol, even when contracting an outside contractor or technical consultant to implement project activities. Project owners are ultimately responsible for the timely submission of all required documents and reports and must comply with the terms of the standardized and harmonized protocol.

Project area

Describe the geographic boundaries of the project area in detail and present a map or maps that display major public and private roads, watercourses, topography and towns, in addition to the latitude and longitude of all key features. Maps must be at an appropriate resolution for all those features to be clearly displayed. The agricultural soil enrichment project area must meet the following criteria:

- Each field must be clearly delineated;

- The area within each field must be continuous (with the exception of minor breaks);

- The same crop or crop mix must be grown throughout each field within a reporting period;

- Permanent or improved roads, watercourses and other physical boundaries must be excluded from the project area;

- The project area must not contain any peatland;

- The project may contain tile-drained fields or surface drainage, provided that the drainage was in place during the baseline period. The drainage must not be installed for the purposes of the project;

- Projects must not include areas that have been cleared of native ecosystems, including established and restored grasslands, within the 10 years prior to the project start date.

The soil enrichment project may, moreover, group together multiple fields into a larger plot, subject to the following preconditions:

- There is no absolute minimum or maximum size for a field to be included in the project;

- The entire project shares a common project owner.

Project eligibility

The soil enrichment project must meet the following criteria:

- Location: in a Congo Basin Climate Commission country;

- Project start date: no more than 24 months following the project proposal submission;

- Project crediting period (the period over which emission reductions can be credited): 10 years per field, renewable twice, up to a total of 30 years;

- Additionality: (a) must comply with performance standards and (b) exceed regulatory requirements;

- Performance: 100 years following the issuance of carbon credits;

- Regulatory compliance: must meet all applicable laws.

Leakage

The proposed standardized and harmonized protocol on GHG emissions establishes robust mechanisms to account for any market leakages associated with reductions in crop and livestock on project territories. Assess any such changes at the field level and aggregate to

the project level. Any significant drops in crop or livestock yield will reduce associated carbon credits. The two most likely scenarios for project leakage are:

- A sustained decline in crop harvesting in the project area;
- The displacement of livestock to outside the project area.

Current scientific research indicates that the soil enrichment projects do not normally have a long-term negative impact on crop yields. The risk of market-shifting leakage therefore remains low for soil enrichment projects.

Greenhouse gas assessment boundary

Delineate the GHG sources, sinks and reservoirs that must be assessed to determinate the net change in emissions resulting from the agricultural soil enrichment project. The GHG assessment boundary should encompass:

- Soil organic carbon (C) modelling and measurement: the key carbon pool that is expected to increase as a result of project activity;
- Soil methanogenesis (CH_4) modelling: must be included if project activity may significantly increase emissions compared to the baseline and may be included in cases in which project activity may reduce emissions compared to the baseline;
- Fertilizer use (N_2O) modelling and calculation: if synthetic and/or organic nitrogen fertilizers are applied in the project or baseline scenarios, N_2O emissions from nitrogen fertilizers must be included in the project boundary;
- Use of nitrogen-fixing species (N_2O modelling): if nitrogen-fixing species are planted in the project or baseline scenario, N_2O emissions from nitrogen-fixing species must be included in the project boundary;
- Manure deposition (CH_4 and N_2O) modelling and calculation: if livestock grazing occurs in the project or baseline scenario, CH_4 and N_2O emissions from manure must be included in the project boundary. Included emissions are those from manure applied to the land directly by livestock or applied to the land from storage, but not those emitted by manure in storage;
- Enteric fermentation (CH_4) modelling or calculation: if livestock grazing occurs in the project or baseline scenario, CH_4 emissions from enteric fermentation must be included in the project boundary;
- Fossil fuel emissions calculation (CO_2): must be included in direct emission accounting;

- Biomass burning modelling or calculation (CH4 and N2O): Must be included if project activity may significantly increase emissions compared to the baseline and may be included if project activity may reduce emissions compared to the baseline.

- Exclude:

- Above-ground biomass (C): this pool is not expected to experience significant changes in the project scenario;

- Below-ground biomass (C): Conservatively exclude, as project activities are likely to increase carbon stocks in this pool;

- Dead wood (C): This pool is not expected to experience significant changes in the project scenario.

- Litter (C): This pool is not expected to experience significant changes in the project scenario;

- Wood products (C): This pool is not expected to experience significant changes in the project scenario.

Quantifying greenhouse gas emission reductions

Quantify the GHG emission reduction resulting from the soil enrichment project by comparing modelled and calculated project emissions with the baseline. Sum net GHG emission reductions for reversible and non-reversible sources separately. Quantify and verify GHG emission reductions for each reporting period. The reporting period is the period over which GHG emission reductions are periodically calculated and reported, in accordance with the terms of the standardized and harmonized protocol. In certain projects, a single reporting period may encompass more than one calculation cycle.

The proposed standardized and harmonized protocol on GHG emissions provides flexible approaches for quantifying emission reductions and removals resulting from improved agricultural management practices compared to the baseline. More than one quantification approach can be used for a given emission source or pool, provided that the same approach is used in both the baseline and project scenarios.

Soil organic carbon levels must be measured at project initiation and at least every five years thereafter. Use a modelling approach if the direct measurement of soil organic carbon levels is not feasible and apply the Global Warming Potential coefficients for non-CO_2 GHGs prescribed in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Those values should be used unless new values are validated by the GHG project verifier.

Every project owner must draw up a monitoring plan explaining how direct measurements and modelling are employed to fulfil all project qualification, monitoring and reporting requirements.

Project monitoring

A monitoring plan should be drawn up to guide all monitoring and reporting activities. That plan serves as a basis for verifiers to confirm that a soil enrichment project meets all monitoring, reporting and verification requirements. The monitoring plan must cover all project monitoring and reporting activities, in accordance with the terms of the proposed standardized and harmonized protocol and should specify how project data is collected and recorded. At a minimum, the monitoring plan should comprise the following elements:

- A general description of the project, including the number of fields and geographical location data;
- A description of the practice changes that will occur within the context of the project;
- A description of how the project meets eligibility requirements;
- Clarification regarding the frequency of data acquisition;
- A record keeping plan;
- Clarification regarding the frequency of instrument cleaning, inspections, field visits and calibration activities (if required);
- Clarification regarding the roles of individuals performing each specific monitoring activity;
- Quality assurance and quality control provisions to ensure that data acquisition and meter calibration are carried out on a regular basis and with high precision (wherever required);
- A modelling plan, if applicable;
- A description of each monitoring task to be undertaken and of the technical requirements for the successful completion of those tasks;
- A description of the parameters to be measured, including any parameters required for the selected model (in additional to those specified in this methodology).

Use of the standardized and harmonized reporting template (set out in annex 3) is strongly recommended.

Project reporting

Submit a verified emission reduction report to the verifier for every reporting period. That report may include the completed standardized and harmonized reporting template (set out in annex 3) together with any supporting documentation, including:

- Project maps, including an updated general overview map in digital format if any changes have occurred since project approval or during the previous reporting period;
- A signed attestation of title;
- A signed attestation of voluntary implementation;
- A signed attestation of regulatory compliance;
- The monitoring plan (submitted at the beginning of the initial reporting period);
- Monitoring reports (for all reporting periods);
- Contract(s) of ownership of emission reductions, wherever applicable.

Verification

Verification must involve the following three processes:

Verification of emission sources, sinks and reservoirs: The verification body must review all sources, sinks and reservoirs identified in the project;

Verification of GHG management systems and estimation methodologies: The verification body must review and assess the appropriateness of the methodologies and management systems used by the soil enrichment project operator to gather data, calculate baselines and estimate project emissions;

Verification of emission reduction estimates: The verification body should also investigate areas in which there is significant potential for material misstatements and confirm whether or not material misstatements have occurred. That process will require site visits to the project field(s) to ensure that the systems on the ground correspond to the data provided to the verification body. In addition, the verification body should recalculate a representative sample of the performance or emissions data for comparison with data reported by the project developer to double-check the calculations made regarding GHG emission reductions.

Annex 2d

Supplemental sectoral outlook: rice cultivation

Congo Basin Climate Commission

Rice cultivation

A supplemental sectoral outlook to complement the proposed standardized and harmonized greenhouse gas protocol: greenhouse gas emission accounting, reporting and verification

Background

Although rice GHG projects can, in principle, be implemented within the context of agriculture and soil GHG emission initiatives, rice cultivation has important characteristics that distinguish it from the cultivation of other agricultural crops. A specific sectoral outlook is therefore required.

Rice has been cultivated in Africa for more than 3000 years. An integral part of the culture in many African communities and the second most important source of calories in Africa after maize corn, rice is currently grown in 40 of the 54 countries in Africa. Rice cultivation is a principal income source for over 35 million smallholder African farmers.

Demand for rice is growing in Africa by 6 per cent each year, faster than any other food staple, due to population growth, urbanization and changing consumer preferences. Local rice production covers only 60 per cent of current demand, however, and therefore has enormous growth potential. Furthermore, women often play a disproportionate role in sowing, weeding, harvesting, processing, and marketing rice across Africa; rice is therefore a key asset in efforts to promote gender equality.

Rice is successfully cultivated in flooded fields in Congo Basin Climate Commission countries. Oxygen is rapidly depleted by the decomposition of organic material in flooded rice fields and the soil rapidly becomes anaerobic and a net producer of methane gas (CH4), which is transferred from the soil to the atmosphere through the rice plants themselves and via floodwaters. Other methane emission factors include the use of fertilizers, the particular characteristics of certain soils, the rice variety chosen and the cultivation practices used.

The most prominent rice producers in Congo Basin Climate Commission countries are Cameroon, the Central African Republic, the Democratic Republic of the Congo, Gabon, Kenya, the Republic of the Congo, Rwanda, and Uganda. As a GHG, methane is 25 times more potent than carbon dioxide. To date, however, no GHG emission projects to curb methane emissions have been launched in any Congo Basin Climate Commission country and there is therefore considerable scope for the countries of the subregion to implement methane emission initiatives.

Methane emissions from rice fields can be reduced through the application of innovative technologies, the removal of crop residues, and effective water management. Due to quantification complexities, biogeochemical models are often employed to quantify rice GHG emission reductions. Those models, which should be properly tested and validated for local use, must take into account the different conditions under which rice is cultivated in the subregion, including different soil types, management practices and local climatic conditions. The Congo Basin Climate Commission could provide targeted support to its member countries and develop market mechanisms to facilitate the localization, updating and diffusion of rice biogeochemical models to other countries and subregions.

This rice cultivation supplemental sectoral outlook has been formulated to complement the proposed standardized and harmonized GHG protocol in the light of the particular impact of that sector on emissions. It provides guidance on how to account and report GHG emission reductions associated with innovative rice cultivation and marketing projects. The methodology set out in the present sectoral outlook specifies eligibility rules, methods for forecasting and calculating reductions, performance-monitoring instructions, and procedures for reporting project information to verifiers. Project proponents initiating rice cultivation GHG reduction projects should refer to this document in conjunction with the proposed standardized and harmonized GHG protocol for methodological support and clarifications regarding subject specificities. This supplemental outlook is designed to ensure the complete, consistent, transparent, accurate and conservative quantification of GHG emission reductions associated with innovative rice cultivation projects. The project should provide for deliberations on the following:

- An estimation of the capacity, structure and dynamism of the rice cultivation market. The project should only encourage GHG reductions that are cost-effective under current and foreseeable market conditions;

- The move towards sustainable development. It is important to clarify how project activities will align with the Sustainable Development Goals, including those Goals relevant to non-GHG benefits that are not addressed in the proposed standardized and harmonized GHG protocol;

- A rationale for pursuing a specific scheme of offset credits and pricing policy.

- A rationale for the implementation of the proposed protocol in Congo Basin Climate Commission countries or the wider region:

    a) A harmonized market in the subregion that will inform carbon markets across the continent, including within the context of the African Continental Free Trade Area,

    b) Market integrity,

    c) Public/private investment,

    d) Other potential benefits.

Phase of the project

Indicate whether the project is in the planning or development phase.

Project area

Greenhouse gas emissions from rice fields can be minimized by adopting the following key management practices:

- Reducing the duration of flooding during the growing season;
- Reducing the duration of flooding outside the growing season;
- Removing crop residues after harvests and before flooding;
- Switching from conventional to low-methane rice cultivars;
- Laser-levelling fields before planting.

Describe the geographic boundaries of the project area in detail and present a map or maps that display major public and private roads, watercourses, topography and towns, in addition to the latitude and longitude of all key features. Maps must be at an appropriate resolution for all those features to be clearly displayed. The rice cultivation project area must meet the following criteria:

- Each field must be clearly delineated;
- The area within each field must be continuous (with the exception of minor breaks);
- The same crop or crop mix must be grown throughout each field within a reporting period;
- Permanent or improved roads, watercourses and other physical boundaries must be excluded from the project area;
- The project area must not contain any peatland;
- The project may contain tile-drained fields or surface drainage, provided that the drainage was in place during the baseline period. That drainage must not be installed for the purposes of the project;
- Projects must not include areas that have been cleared of native ecosystems, including established and restored grasslands, within the 10 years prior to the project start date.

The rice cultivation project may, moreover, group together multiple fields into a larger plot, subject to the following preconditions:

- There is no absolute minimum or maximum size for a field to be included in the project;
- The entire project shares a common project owner.

Project ownership

Rice cultivation projects will generally involve several parties, including landowners, field managers, project developers, project owners and aggregators. Any of those stakeholders could be the project owner of a particular project. A project developer may be a contracted third party. When the project is validated, the project owner must attest that no other entities are reporting or claiming the GHG reductions caused by the project.

Every rice cultivation project must have a single project owner. The project owner must exercise clear ownership of the project's GHG reductions during the entire period covered by the project agreement. The project owner will be personally and solely responsible for the accuracy and completeness of all submitted information. The project owner should ensure compliance with the proposed standardized and harmonized protocol, even when contracting an outside contractor or technical consultant to implement project activities. Project owners are ultimately responsible for the timely submission of all required documents and reports and must comply with the terms of the standardized and harmonized protocol.

A field can be withdrawn from the project during the crediting period only if:

- The field changes ownership, tenant occupancy or management control during the crediting period and the new owner, tenant or manager has other fields already enrolled with a different aggregator;
- The original aggregator goes out of business;
- The aggregator breaches its contract with the project participant.

Project eligibility

Rice cultivation projects must meet the following eligibility criteria:

- The project must include a minimum of five individual rice fields with a total area of more than 405 hectares in order for modelling forecasting to be sufficiently accurate. Those fields can be tended by one or more farmers;
- The estimated GHG emission model should be calibrated for each field;
- The rice fields must have been under rice cultivation for at least five years prior to the start of the project. The fields must be flooded for a period of at least four months during the growing season. In other words, the methodology is only applicable for rice cultivation under flooded conditions;
- Field management records must be available for at least five years prior to the start of the project.

- If the proposed project causes a significant drop in yield, and it is determined that the drop in yield was not due to climatic or other external factors, then emissions credits must be discounted in accordance with the applied methodology;

- The project area may not contain organic carbon at levels exceeding 3 per cent in the top 30 cm of soil;

- The project area should be surveyed using a combination of census data, remote sensing, and field surveys;

- The maximum permitted reduction in flooding area is 10 per cent for each month between the harvest and the following planting date. This practice is known as "rotational flooding";

- Some 10 to 15 cm of average water depth should be maintained in the project areas during seasonal flooding.

Leakage

Leakage is negligible since yields are not affected.

Greenhouse gas assessment boundary

The GHG assessment boundary encompasses all GHG sources, sinks and reservoirs that may be significantly affected by rice cultivation project activities, including sources generating CH_4, N_2O and CO_2 from both biological and fossil fuels. Sources, sinks and reservoirs are defined as per ISO 1064-2 (International Organization for Standardization, 2019a) and the GHG Protocol Corporate Accounting and Reporting Standard (Greenhouse Gas Protocol, 2004). For accounting purposes, split the sources, sinks and reservoirs into two categories namely primary and secondary effects. Primary effects include all biological soil emissions of N_2O, CH_4 and CO_2. Secondary effects include unintended on-field or off-field changes, such as CO_2 emissions from gasoline combustion. Account for all sources, sinks and reservoirs within the GHG assessment boundary.

Quantifying greenhouse gas emission reductions

Quantify GHG emission reductions resulting from implementation of a rice cultivation project by comparing modelled and calculated project emissions with baseline emissions. Baseline emissions are estimates of the emitted GHGs within the GHG assessment boundary that would have occurred had the project not been implemented. Actual emissions are those resulting following implementation of the rice cultivation project. The net GHG emission reduction can be calculated by comparing the two figures.

Enhanced rice cultivation projects are likely to lead to a reduction in methane emissions as a result of a decrease in the duration of the period in which fields are flooded or by decreasing the availability of dissolved organic matter in the soil by means of residue baling. A decrease

in flooding is achieved by switching to dry seeding and by delaying the flooding period. The magnitude of both reductions is variable and will depend on numerous managerial, technological and soil-, weather- and climate-related factors.

Project monitoring

A monitoring plan should be drawn up to guide all monitoring and reporting activities. That plan serves as a basis for verifiers to confirm that a rice cultivation project meets all monitoring, reporting and verification requirements. The monitoring plan must cover all project monitoring and reporting activities, in accordance with the terms of the proposed standardized and harmonized protocol. Two types of monitoring plan and reports should be formulated, namely plans and reports at the aggregate level, and plans and reports at the field level.

Prepare a single-field monitoring plan for the purposes of verification. Ensure that consistent monitoring and rigorous record keeping are undertaken. The plan should set out the following:

- How geographical information system files are to be created;
- How the crediting period, verification and quantification for each field will be established or conducted;
- Evidence that the project developer is entitled to claim any resulting GHG emission reductions;
- Evidence that the project meets all relevant legal and regulatory requirements;
- Evidence that the project will meet at least minimum record keeping requirements;
- Evidence that data acquisition and sampling will be carried out at regular intervals;
- The names of the individuals responsible for each specific activity, including monitoring and sampling exercises;
- Evidence that data acquisition will be carried out consistently and precisely.

Project reporting

Submit a verified emission reduction report to the verifier for every reporting period. That report may include the completed standardized and harmonized reporting template (set out in annex 3) together with any supporting documentation, including:

- Project maps, including an updated general overview map in digital format if any changes have occurred since project approval or during the most recent reporting period;

- A signed attestation of title;
- A signed attestation of voluntary implementation;
- A signed attestation of regulatory compliance;
- The monitoring plan (submitted at the beginning of the initial reporting period);
- Monitoring reports (for all reporting periods);
- Contract(s) of ownership of emission reductions, wherever applicable.

Verification

Only accredited verification bodies that employ specialists in rice projects are eligible to verify rice cultivation projects. Verification bodies qualified in other protocols are not permitted to verify those projects. Verification bodies must, moreover, include an accredited professional agronomist or certified crop advisor on the verification team. Those stringent requirements for verification underscore the demanding and complicated nature of the verification process.

To facilitate verification, the project developer should firstly submit all necessary documentation to the verifier. The selected project verification body may be used for up to six consecutive years, at which point another verification body must be selected. Verification bodies must pass a conflict-of-interest review against the project developer. In the case of project aggregates, the review should take into consideration potential conflicts of interest involving all project participants, including the aggregator. The submitted list of enrolled fields must be updated prior to the conflict-of-interest review process.

Verification must involve the following three processes:

Verification of emission sources, sinks and reservoirs: the verification body must review all sources, sinks and reservoirs identified in the project;

Verification of GHG management systems and estimation methodologies: the verification body must review and assess the appropriateness of the methodologies and management systems used by the rice cultivation project operator to gather data, calculate baselines and estimate project emissions;

Verification of emission reduction estimates: The verification body should also investigate areas in which there is significant potential for material misstatements and confirm whether or not material misstatements have occurred. That process will require site visits to the project field(s) to ensure that the project corresponds to the data provided to the verification body. In addition, the verification body should recalculate a representative sample of the emissions data for comparison with data reported by the project developer to double-check the calculations made regarding GHG emission reductions.

Annex 3

Reporting template for the proposed standardized and harmonized greenhouse gas protocol

Congo Basin Climate Commission

Reporting template for the proposed standardized and harmonized greenhouse gas protocol

Required information

Section A: General description (refer to Step 1, Phases 1 and 2 of the standardized and harmonized protocol)

A.1. Reporting period: From to (dd/mm/yyyy)
A.2. Organization information
Organization name:
Organization address:
Office number:
Building name:
Street name:
Town/city and postal code:
Company registration number:
Number of employees/corporate total:
Organization website:
Organization contact person:
Contact person designation:
Contact person email:
Contact person phone no.:

A.3. Sectors/areas

Please check all relevant boxes

	Sectors/areas
☐	Improved forest management projects
☐	Energy efficiency/cleaner cookers/efficient cookstoves
☐	Agriculture and soil carbon: (a) soil enrichment, (b) rice cultivation, (c) organic waste, including composting, (d) Soil carbon sequestration using biochar
☐	Land-use planning and zoning for mine sites
☐	Wood fuel plantations and energy efficiency
☐	Wetland restoration/peatland management
☐	Others (please specify)

Section B: Reporting boundaries (refer to Step 1, Phases 3, 4, 5 and 10.1 of the standardized and harmonized protocol)

B.1. Organizational boundaries (refer to Step 1, Phase 3)

Which consolidation approach(es) were chosen by your organization? Indicate each consolidation approach for which your organization reports emissions. If your organization reports according to more than one consolidation approach, please complete and attach additional completed reporting templates that provide your organization's emissions data in accordance with all consolidation approach(es)

☐ Equity share		☐ Financial control		☐ Operational control	
List of legal entities	Equity share in the legal entity, %	List of legal entities	Does the organization have financial control? (yes/no)	List of legal entities	Does the organization have operational control? (yes/no)

Have any legal entities been excluded from this report? If the answer is yes, please specify and justify their exclusion below
If the parent company of the reporting organization does not report emissions, please provide an organizational diagram that clearly indicates the relationship among the reporting and other subsidiaries
Please provide a diagram depicting the organizational boundaries
Have any scope 1 and scope 2 activities been excluded from this report? If the answer is yes, please specify and justify their exclusion below

B.2. Operational boundaries (refer to Step 1, Phases 4, 5 and 10.1 of the standardized and harmonized protocol)

Are scope 3 emissions included in this report? Please tick yes/no

Sources of scope 3 emissions	Yes	No	If "No", please explain the exclusions
a. Purchased goods and services	☐	☐	
b. Capital goods	☐	☐	
c. Fuel-related and energy-related activities (not included in scopes 1 or 2)	☐	☐	
d. Upstream transportation and distribution	☐	☐	
e. Waste generated in operations	☐	☐	
f. Business travel	☐	☐	
g. Employee commuting	☐	☐	

h. Upstream leased assets	☐	☐	
i. Downstream transportation and distribution	☐	☐	
j. Processing of sold products	☐	☐	
k. Use of sold products	☐	☐	
l. End-of-life treatment of sold products	☐	☐	
m. Downstream leased assets	☐	☐	
n. Franchises	☐	☐	
o. Investments	☐	☐	

Section C: Reported emissions (refer to Steps 2 and 3 of the standardized and harmonized protocol)

C.1. Information on emissions

The table below refers to emissions independent of any GHG trades, including sales, purchases, transfers, or banking of allowances (please attach a copy of the calculation sheet)

Emissions	Total* (mt CO_2e)	CO_2 (mt)	CH_4 and (mt)	N_2O (mt)	HFCs (mt)	PFCs (mt)	SF_6 (mt)	NF_3 (mt)
Scope 1								
Scope 2								
Scope 3 (optional)								
Total*								

* Please round up figures

Emissions disaggregated by source type

Scope 1: Direct emissions from owned/controlled operations	Total* ($mtCO_2e$)
a. Direct emissions from stationary combustion sources	
b. Direct emissions from mobile combustion sources	
c. Direct emissions from process sources	
d. Direct emissions from fugitive sources	
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating and cooling	Total* ($mtCO_2e$)
a. Indirect emissions from purchased/acquired electricity	
b. Indirect emissions from purchased/acquired steam	
c. Indirect emissions from purchased/acquired heating	
d. Indirect emissions from purchased/acquired cooling	
Scope 3: Other indirect emissions – upstream (optional)	Total* ($mtCO_2e$)

a. Indirect emissions from purchased goods and services	
b. Indirect emissions from capital goods	
c. Indirect emissions from fuel-related and energy-related activities (not included in scope 1 or scope 2)	
d. Indirect emissions from upstream transportation and distribution	
e. Indirect emissions from waste generated in operations	
f. Indirect emissions from business travel	
g. Indirect emissions from employee commuting	
h. Indirect emissions from upstream leased assets	
i. Indirect emissions from downstream transportation and distribution	
j. Indirect emissions from processing of sold products	
k. Indirect emissions from use of sold products	
l. Indirect emissions from end-of-life treatment of sold products	
m. Indirect emissions from downstream leased assets	
n. Indirect emissions from franchises	
o. Indirect emissions from investments	

* Please round up figures

Direct CO_2 emissions from biogenic combustion ($mtCO_2e$)	

C.2. Base year

Year chosen as base year (e.g. 2020)	

Clarification of company-determined policy for making base year emission recalculations
Context for any significant emission changes that trigger base year emission recalculations

Base year emissions**

Emissions	**Total* ($mtCO_2e$)**	**CO_2 (mt)**	**CH_4 (mt)**	**N_2O (mt)**	**HFCs (mt)**	**PFCs (mt)**	**SF_6 (mt)**	**NF_3 (mt)**
Scope 1								
Scope 2								
Scope 3 (optional)								
Total*								

* Please round up figures
** Do not fill in this section if the information provided on base year emissions is the same as the information above on reporting year emissions

Base year emissions disaggregated by source type**

Scope 1: Direct emissions from owned/controlled operations	Total* ($mtCO_2e$)
a. Direct emissions from stationary combustion sources	
b. Direct emissions from mobile combustion sources	
c. Direct emissions from process sources	
d. Direct emissions from fugitive sources	
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating and cooling	Total* ($mtCO_2e$)
a. Indirect emissions from purchased/acquired electricity	
b. Indirect emissions from purchased/acquired steam	
c. Indirect emissions from purchased/acquired heating	
d. Indirect emissions from purchased/acquired cooling	
Scope 3: Other indirect emissions – upstream (optional)	Total* ($mtCO_2e$)
a. Indirect emissions from purchased goods and services	
b. Indirect emissions from capital goods	
c. Indirect emissions from fuel-related and energy-related activities (not included in scope 1 or scope 2)	
d. Indirect emissions from upstream transportation and distribution	
e. Indirect emissions from waste generated in operations	
f. Indirect emissions from business travel	

* Please round up figures
** Do not fill in this section if the information provided on base year emissions is the same as the information above on reporting year emissions

Direct CO_2 emissions from biogenic combustion ($mtCO_2e$)	

C.3. Methodologies and emissions factors

List the methodologies and emissions factors developed by Greenhouse Gas Protocol that have been used to calculate or measure emissions
List the methodologies and emissions factors developed by parties other than Greenhouse Gas Protocol that have been used to calculate or measure emissions (please provide the name and a reference or link to any non-GHG Protocol calculation tools used)

Description of the assumptions used to calculate emissions (if any)

Scope 1. Direct emissions from owned/controlled operations	Reporting year	Base year
a. Direct emissions from stationary combustion sources		
b. Direct emissions from mobile combustion sources		
c. Direct emissions from process sources		
d. Direct emissions from fugitive sources		
Scope 2: Indirect emissions from the use of purchased electricity, steam, heating and cooling	Reporting year	Base year
a. Indirect emissions from purchased/acquired cooling		
Scope 3: Other indirect emissions – upstream (optional)	Reporting year	Base year
a. Indirect emissions from purchased goods and services		
b. Indirect emissions from capital goods		
c. Indirect emissions from fuel-related and energy-related activities (not included in scope 1 or scope 2)		
d. Indirect emissions from upstream transportation and distribution		
e. Indirect emissions from waste generated in operations		
f. Indirect emissions from business travel		
g. Indirect emissions from employee commuting		
h. Indirect emissions from upstream leased assets		
i. Indirect emissions from downstream transportation and distribution		
j. Indirect emissions from processing of sold products		
k. Indirect emissions from use of sold products		
l. Indirect emissions from end-of-life treatment of sold products		
m. Indirect emissions from downstream leased assets		
n. Indirect emissions from franchises		
o. Indirect emissions from investments		

Section D: Consultants, assurance and verification

D.1. Consultants

Has this report been prepared by an external consultant?	☐ Yes	☐ No

If yes, please provide the consultant's contact information below:

Registration number:	
Registered consultant:	
Registration expiration date (dd/mm/yyyy):	
Contacts:	
Telephone:	
Email:	
Address:	

D.2. Verification/assurance

Has this report been subjected to self-assurance or self-verification?*	☐ Yes	☐ No

* Information on verification processes in corporate social responsibility reporting, sustainability reporting, or other disclosure formats which refer to GHG emission accounting and reporting could be disclosed here

If yes, please provide details below:

Summary of the assurance process
Explanation of how any potential conflict of interest was avoided

Has this report been verified by a third party registered with Congo Basin Climate Commission?	☐ Yes	☐ No

If yes, please provide the verifier's contact information below and attach a copy of the verification statement

Registration number:	
Registered consultant:	
Registration expiration date (dd/mm/yyyy):	
Telephone:	
Email:	

Address:	

Section E. Reduction reporting (refer to Step 4)

Reduction strategies and targets

State your overall reduction goal
Provide an overview of your reduction initiatives, namely the decisions made prior to the activity that led to the emissions reduction (if any) compared to the business as usual scenario

Please describe your current emissions reduction actions (ongoing or completed)

Activity	Reduction target	Focus area and target	Status (ongoing or completed) and performance (% of project duration completed)

Please describe your future emissions reduction plans

Activity	Reduction target	Focus area and target	Status (ongoing or completed) and performance (% of project duration completed)

Optional information

Section F: Optional information

F.1. Additional information on emissions and project performance

Relevant ratio performance indicators (e.g. emissions per kilowatt-hour generated, sales) to facilitate benchmarking

Information on structural, methodological and data changes that did not trigger a base year emissions recalculation (e.g. process changes, efficiency improvements, plant closures)

GHG emissions data for all years between the base year and the reporting year

Emissions ($mtCO_2e$)	
Scope 1	
Scope 2	
Scope 3	
Total	

Information on data quality (e.g. information on the causes and magnitude of uncertainties in emission estimates) and an outline of policies in place to improve quality
Information on other carbon reduction initiatives (e.g. renewable energy initiatives)

F.2. Information on carbon offsetting

Has your company/organization joined any carbon offset programme?	☐ Yes	☐ No

If yes, please provide the following information:

The carbon credit system (Kyoto-compliant) in which your company/organization is involved

Carbon credit system (Kyoto compliant)	
Project title	
Supplier name	
Project documentation hyperlink (where possible) or attach a copy of the project document	

The carbon credit system (non-Kyoto-compliant) in which your company/organization is involved

Type of carbon credit (non-Kyoto-compliant)	
Project title	
Supplier name	
Project documentation hyperlink (where possible) or attach a copy of the project document	

For purchased carbon credits, state the reduction in $mtCO_2e$ applicable to the current reporting year

Section G. Declaration for the submission of corporate GHG reporting to the Congo Basin Climate Commission secretariat

G.1. Declaration for the submission of corporate GHG reporting to the Congo Basin Climate Commission secretariat

1. I declare that submission of all information in this declaration form, report and supporting documentation is correct and valid. I hereby allow the Congo Basin Climate Commission secretariat to verify any information in this form, report and supporting documentation with the organization or with any other third party;

2. I understand and acknowledge that the omission of any relevant information or documentation, or the submission of any information or document that is false or misleading may result in the rejection of this report, and;

3. I hereby agree that the information submitted with this report may be made available for use by the Congo Basin Climate Commission.

G.2. Signature block

Signature:		
Name:		
Passport No:		Official stamp of the
Designation:		organization
Name of organization:		
Date (dd/mm/yyyy)		

Note:
To be signed by owner/director/manager of the organization who has been authorized to affirm this declaration on behalf of the organization.

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