



Ghana

Ghana Climate Ambitious Reporting Program

Good practice summary

[Results/insights]

Ghana's Climate Ambitious Reporting Program (G-CARP) is an integrated system for continuous data generation on greenhouse gas (GHG) inventories, mitigation actions and support¹. Ghana's domestic Measuring, Reporting and Verification (MRV) system aims to ensure that the existing sector or national development Measurement & Evaluation (M&E) system is able to measure: (a) GHG emissions or reductions attributed to a particular mitigation action (e.g. policy, programme, measure or project); (b) climate-related support provided by the Government of Ghana or donors in the form of finance, technology transfer and capacity-building to enable implementation of a certain action, or as a result of an action taken in a particular sector of the economy; (c) sustainable development benefits of mitigation actions.

Scope covered

Function

Measuring Reporting Verification Accounting

Administrative scope

National Regional City-level Policy/programme/project Corporate/Facility-level

Legal basis

[policies, regulations and commitments that the case study has to comply with]

Environmental Protection Agency Act, 1994 Act 490 (EPA Act 490)²: The work package which governs GHG inventories and mandates the EPA to administer the Environmental Impact Assessments (EIA) procedures.

Environmental Assessment Regulations 1999: Defines the required EIA procedures to allow the EPA to collect environmental data on regular basis.

National Development Planning Commission (NDPC) Act (Act 656)³: Allows NDPC to perform monitoring and evaluation of implementation national development plans and policies and published through the annual progress report.

Operational since

The institutional arrangements were implemented in 2013 and contributed to the Third National Communication (TNC), Biennial Update Report (BUR) and National GHGI.

¹<http://mitigationpartnership.net/gpa/ghana%E2%80%99s-ambitious-climate-reporting-programme>

²<http://www.resourcegovernance.org/sites/default/files/Environmental%20Protection%20Agency%20Act.pdf>

³<https://www.ndpc.gov.gh/about>

How is this related to accounting?

[The following is based solely on the consultant's opinion]

» What kind of measures, policies, or commitments are a) monitored and included in an accounting system, b) only monitored, but not included in an accounting system, or c) not even monitored?

The G-CARP allows alignment with Ghana's national GHG inventory system as it is built upon the foundations the inventory system has laid. The key factor is the continuous progress to consolidate and mainstream G-CARP's operations with workings of the ministries, departments and agencies (MDAs), industry, businesses and non-governmental organization (NGOs). The consolidation process is not only to strengthen, but also to enable meeting reporting requirements.

The G-CARP enables Ghana to compile, collate and report GHG emission reduction data at national, sectoral and where possible, project level. The methodologies contained in the IPCC 2006 Guidelines for National GHG inventories⁴ are used as the basis for the methodologies and assumptions used to estimate GHG emission reductions, the data will enable understanding of emissions reductions for each mitigation action, if these are aligned with the national GHG inventory.

Case description

Background

» What was the need, pre-conditions, and/or experiences that motivated the country to develop this system?

As a party to the United Nations Framework Convention on Climate Change Committee (UNFCCC), Ghana submitted their first, second and third National Communications (INC, SNC and TNC) in 2001, 2011 and 2015, respectively, as well as their first biennial update report (BUR) in 2015⁵. However, preparation for the INC and SNC was based on ad-hoc and informal institutional arrangements that lacked any sustainable or reliable structures that are necessary to efficiently update future international reporting obligations. Another problem Ghana had faced in the preparation of these documents was the lack of any formal arrangements for data collection and the lack of engagement with key stakeholders, such as sector ministries. These problems led to the need to reform the existing national system for compiling climate change information for international and domestic reporting. Following this, in 2013 the Ghana Environmental Protection Agency (EPA) under the Ministry of Environment, Science, Technology and Innovation (MESTI) launched the Ghana Climate Ambitious Reporting Program (G-CARP). This coincided with the UNFCCC Conference of Parties (COP) decision to enhance climate reporting. As a result, during the compilation of the TNC⁶ and the BUR⁷, Ghana sought to improve the ad-hoc and informal institutional arrangements that affected the SNC process.

⁴<http://unfccc.int/resource/docs/natc/ghnbur1.pdf>

⁵http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php

⁶<http://unfccc.int/resource/docs/natc/ghanc3.pdf>

⁷http://unfccc.int/national_reports/non-annex_i_natcom/reporting_on_climate_change/items/8722.php

General description of the system

[Questions below should be answered only when applicable]

- » General definition/description of the system
- » What are the main types of action that mitigate GHG emissions?
- » What linkages to other systems/ system elements of environmental information (including adaptation to climate change or emissions trading schemes) do exist and why were they established? What linkages exist to other statistical/ monitoring systems?
- » Which platforms are used to transport information and are they specific to the purpose of usage MRV information?

G-CARP was developed to facilitate the development of an integrated reporting system to enable Ghana to meet its national reporting obligations (NCs, BURs, participating in International Consultation and Analysis (ICA) of the BUR, and providing evidence to support climate mitigation planning across all levels), as well as to track national policy implementation, in a sustainable and reliable way. It was required to integrate the existing national system into the overall M&E superstructure and certain reforms where needed to make this a reality. This system is still in design and is planned to be in place in 2020. The reforms that were introduced covered four main thematic areas comprising: (1) data management, (2) institutions and responsibilities, (3) IT and methodologies, and (4) continuous capacity development.

There are four functional components of the G-CARP including: (1) Setting up of revised institutional arrangements, (2) operationalising the collaborative mechanisms through memoranda of understanding (MOUs) that underpin activities of the institutions, (3) Setting up an online climate change data hub, and (4) Continuous training and capacity development of new and existing teams.

The development and operationalisation of this domestic MRV system focuses on integration into the existing national development M&E (adaptation) superstructure rather than setting up new layer structures. The information is compiled into one online database aiming to gather all information to be included in G-CARP.

The first version of the platform database is up and running and currently undergoing testing (April 2016)⁸. The platform provides an online Climate Change Data Hub, a 'one stop shop' for all climate change-related data and activities.

The Climate Change Data Hub has three interfaces, listed below:

1) The GHG emissions database contains archive data used for the generation of the national estimates. It is designed to help improve the archiving of all data used in the National GHG Inventory and also ensure that the general public has access to the open-source end database which contains already publically-available national datasets (not the data itself)⁹. The public have access to the database through an open search and retrieval window but cannot upload without approval from the webmaster at EPA. One part of the database contains all activity data and emission factors for a specific inventory year. The other part of the database contains disaggregated primary input activity data. Access to the primary activity data section of the database is password restricted. Access to upload primary data and data files as well as higher access level for the administrator who filters and publishes the information online is restricted. Registered users can search, retrieve and upload data. The main use of the GHG portal is to serve as an inventory data documentation and archiving platform (DAA)

⁸It can be publically accessed at www.climatedatahubgh.com

2) A domestic Electronic Registry System (DER) as a centralised data point for monitoring all past and present climate change initiatives, including sources of support. Support for the climate change initiatives comes from bilateral, multilateral, co-funding, GEF, national and private-sector sources¹⁰. To avoid confidentiality issues, any confidential data is aggregated. The registry at this stage contains a list of 91 climate actions with information on sector, funding, donors, and the project names. The plan is to add new information on implementation status, impacts/outputs and disbursements. The new system is currently being created and by the close of the year 2016 this new information will be uploaded to the database¹¹.

3) A Dashboard on Climate Policies and Measures (PaMs) that captures all climate-related policies and measures in the productive economic sectors in Ghana. The dashboard has a tracker designed to track the progress of implementation towards goals^{12,13}. Policies and measures are split into three categories; Agriculture, Forestry & Land Use (AFOLU), renewable energy and energy efficiency, and sustainable development and climate change.

As of April 2016, the GHG, Domestic Electronic Registry System (DER) and Climate Policies & Measures Database (PaMs) portals have been deployed and data upload has taken place by the EPA. Additional portals will be included after the testing phase. There are future plans to add two additional dedicated portals on Intended Nationally Determined Contributions (INDC) and Green Climate Fund (GCF) project pipelines.

MRV and accounting systems, processes and procedures

[Questions below should be answered only when applicable]

- » How is information generated, communicated, integrated, and verified at each stage of the MRV chain?
- » What information needs to be gathered in order to quantify the effect of these actions?
- » How is such information gathered or estimated? By whom?
- » How is this information reported? How is it verified?
- » In what areas information is shared among accounting and MRV systems?
- » What kind of agreements are used to establish the relevant institutional roles?

The Annual Progress Report (APR) is an M&E tool for tracking the implementation of development policies and was identified by key stakeholders as a reliable channel for monitoring implementation of mitigation policies and measures.

It was first prepared by the individual sector and subsequently compiled into national APR by the National Development Planning Commission (NDPC). At the sectoral level, stakeholders identified the annual publication of the energy statistics and energy balance as a good channel for monitoring energy related mitigation actions.

The APR system has been established by NDPC law which allows them to monitor and track implementation of medium term plans by sectors before it is aggregated into a national APR. The APR system is based on a results framework which contains the indicators for each of the sectors agreed by the stakeholders.

Once the indicators are agreed, they cannot be changed until a new planning cycle begins. In Ghana the plan to use the APR system to support the MRV for the INDC is opportune because Ghana is in the process of preparing a 40-year long term plan with 10-year cycle divided into four medium term framework. This will provide the opportunity for the inclusion of direct climate indicators in the APR system.

⁹<http://www.climatedatahubgh.com/ghg-database.html>

¹⁰<http://www.climatedatahubgh.com/ders.html>

¹¹<http://www.climatedatahubgh.com/ders.html>

¹²<http://www.climatedatahubgh.com/policies---measures.html>

¹³http://mitigationpartnership.net/sites/default/files/u1679/ghana_experiences_on_ghg-dan.pdf

Data collection on the impact of mitigations will be carried out via regular surveys and also systematically through the sectoral APR system, where sectors are able to develop indicators and report through the sector APR. However, it is important to recognise that it will take some time before it will be fully operational. The plan is to stagger the rolling out of the data collection of the mitigation and adaptation impacts during the pre-2020 readiness activities.

The data required to be gathered in order to track the impacts of mitigation actions is:

- » Number of beneficiaries
- » Rate of adoption/use of a particular mitigation technology(ies)
- » Cost incurred or investment made
- » Amount of input fuels
- » Amount of electricity demand/consumption
- » Areas afforested/reforested

As mentioned above, this information will be gathered through a survey carried out by the EPA on an annual basis. The EPA is currently exploring the possibility to use the existing Environmental reporting system for the industrial sector. The EPA is also planning to carry out the verification process offline once has received the annual survey from stakeholders. The verification will check for completeness, transparency and accuracy. When the technical verification is done, the information will be passed on the webmaster where it will have an electronic stamp before being published on the climate hub. As of this moment, there are no plans on how to link the emission reductions to the national GHG inventory. The type of data to be collected will depend on type of mitigation action and the scale at which it is being implemented.

The EPA is planning to track the impacts of mitigation actions and do an assessment on a yearly basis. The results will be published in the domestic electronic registry system (DERS), hosted by the climate data hub. The idea is to develop a standard template to guide the key ministries and stakeholders to report on annual basis to the EPA. The template will be disseminated through a questionnaire. The EPA will verify the information included in the report before it is published on the website. Currently, the UNDP is helping the EPA to track the implementation and assess the GHG and non-GHG impacts of nearly 42 project-based mitigation actions.

This means, MDAs will have to be involved in data collection of the climate actions; this data will later on be integrated into the system via the data collection hub. The data collection hub will be integrated into the existing data collection hubs and in the 'Online Climate Change Data Hub'.

The data collection process comprised the collection of information on mitigation actions via interviews with key stakeholders. The information collected was guided by the reporting requirement in the compilation of the BUR. The information collected includes scope and type of mitigation, steps taken or envisaged to be taken and achievements and challenges. These data sets were collected by the national working groups on TNC/BUR with support from the EPA. This process has proven invaluable in generating new activity data into one central database. This integrated online climate change data hub will serve as a central database for all climate related documentation and archiving.

It is planned that the hub will eventually link to other data sites such as the Ghana Energy Access (GhEA) Database, National Forestry Inventory Web GIS Portal. The new platform introduces a comprehensive, holistic data collection system which will be transparent with robust QA/QC, data archiving and data reporting. The EPA is planning to functionally link all the systems together. The design platform of some platforms is different and the making the link has been proven to be a challenge.

Open discussions take place between the owners of the systems to see and understand the possibilities of sharing information regularly on an ad-hoc basis.

The EPA uses MOUs to define deliverables and timelines with the various stakeholders involved in the G-CARP¹⁴. The existing data acquisition process will serve as foundation for the expansion of the collection under the MRV process. It will mean additional institutions will have to be brought on board including more private sector businesses. IT solutions need to be deployed, training and capacity enhancement will need to take place and above all, further streamlining of the existing data sharing platforms will be needed.

Currently, there are 7 main data generation platforms that supply data to the GHG inventory and will support the MRV system. These are as follows: (a) annual publication of the energy statistics/energy balance; (b) annual agriculture facts and figures, (c) annual vehicle registration and road worthy/vehicle inspection figures, (d) Annual environmental report to EPA and environmental performance rating system, (e) less frequent forest inventory report, (f) five-year Ghana living standard survey and (g) seldom waste generation and management data for local authorities.

Design and set-up

[Questions below should be answered only when applicable]

- » How was the system designed?
- » What was the overall process to set-up the system?

During the design and set-up of the G-CARP system, key stakeholders identified a number of existing national/international reporting mechanisms that would assist for the collection and tracking of data (e.g. indicators) on the progress of the implementation of mitigation actions in Ghana. A list of around 40 existing reporting channels for collecting and tracking data on implementation of mitigation actions and support¹⁵ were identified from the national level to the project level. These include mechanisms such as national budgets, agricultural census and NCs, as well as reports from sector specific projects (e.g. inception reports from energy-related projects).

The list of 40 reporting channels has been compiled and are already in operation. All of them were established prior to climate reporting becoming imperative. Thus, the plan is to make use of the existing reporting platforms relevant to the MRV process. Key stakeholders at the stakeholder consultations identified the APR M&E tool for tracking the implementation of development policies as a robust mechanism that could be integrated into the MRV system.

Ghana's MRV experts planned and staged development and setting up of the domestic MRV in phases. Firstly mapping major institutions and their roles in the MRV structure. They then focused on the operationalization of the institutional setup and the system for continuous data collection and sharing on major mitigation actions and support flowing into the country.

The first phase of the MRV set up included identifying institutions, designing data collection templates, installing and launching the MRV prototype. This was accomplished in April 2016.

However, there is still a lot of progress to be made before it is fully operational and running efficiently. At this stage it is important to bring all the pieces of work together in order for the system to function effectively. In doing so, the next phase of integration will commence. The road map for the development of Ghana's domestic MRV system is presented below in Figure 1.

¹⁴<http://www.resourcegovernance.org/sites/default/files/Environmental%20Protection%20Agency%20Act.pdf>

¹⁵http://lowemissiondevelopment.org/lecbp/docs/countries/Ghana/Back_to_back_workshop_report.pdf

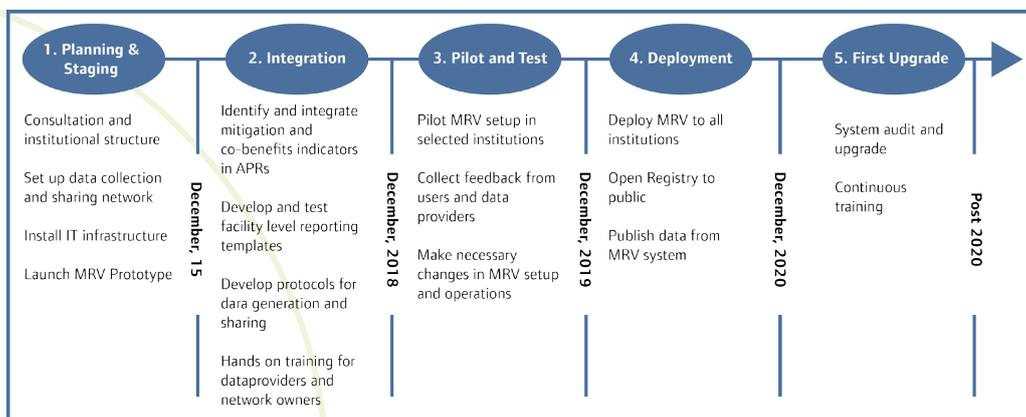


Figure 1 MRV development roadmap

The design and operationalization of the domestic MRV system will be rolled out in 4 stages from 2015 to 2020. The programme will be phased and is sequenced as follows: (a) planning and design; (b) integration; (c) piloting and testing; and (d) functional deployment (Figure 2). The domestic MRV system will have different hardware and software elements which will together work as one functional unit.

The arrangements of the functional units of the MRV configuration are presented in Figure 2. Almost all the activities in the planning and staging phase have been implemented. The coming on board of the MRV for NDC may require additional tweaking of the design to become more responsive to the demands the implementation of the NDC.

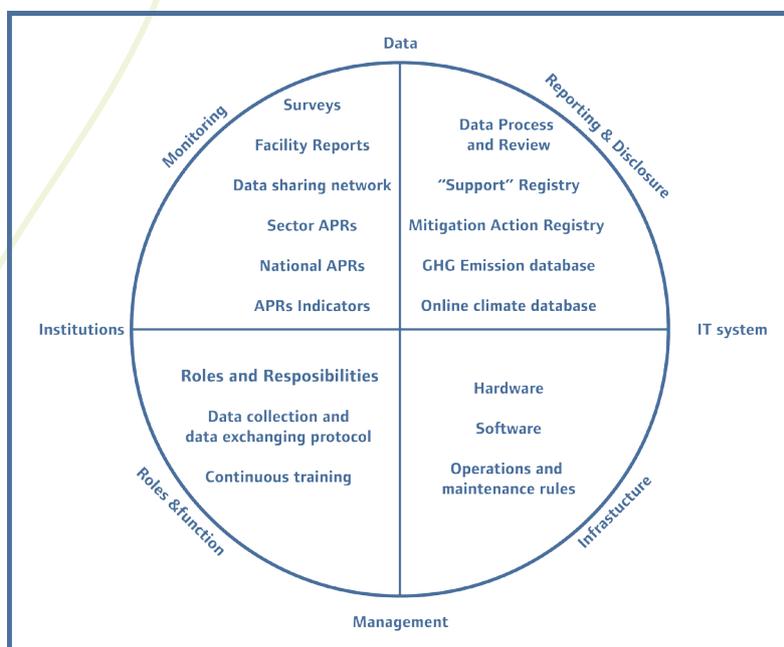


Figure 2 MRV configuration¹⁶

¹⁶<http://unfccc.int/resource/docs/natc/ghnbur1.pdf>

The MRV setup will be integrated into existing development of M&E both at the national, sectoral and probably at the district levels where possible. As part of the integration process, indicators for mitigation actions, effects and co-benefits for key policies and measures will be developed and included in the national M&E framework. The M&E framework will track the implementation of national and sector policies and programmes and report annually in the APR.

The APR will then become the main M&E framework for monitoring implementation of mitigation actions and their GHG impacts and co-benefits. Within the new framework, the Ministry of Finance will continue its annual survey of climate finance inflows and domestic contributions through the national budget.

The existing annual report submitted by industry to regulatory bodies such as EPA and Energy Commission will be used to monitor facility level reporting. MRV/M&E templates will be developed and incorporated into the existing reporting template.

The operationalisation of the system is also currently in development. Many of the institutions have been identified and their roles defined, data reporting templates for sectors to report on their mitigation actions have been prepared and are in use and the database and IT infrastructure has been deployed. The database is being run on both a standalone server and cloud technology.

Improvement over time

» Is there an internal evaluation of the systems established aiming to enable improvement over time?

- » With support from UNDP LECBP and the World Bank, MRV experts have managed to put in place an integrated, GHG database, climate actions and policies and measures on an online data hub.
- » Planned continuous training and capacity development has been carried out by MRV experts for potential users of the system. New and existing teams have been trained since 2013 under the UNDP LECBP. This process is continuous and ongoing.
- » The approach began with a simple system but aims to consistently improve towards a dynamic and comprehensive climate data management system. Regular hands-on training on the system will also be organized for data providers and data network owners

There is an on-going effort to add 2 new portals on INDC and GCF project pipeline.

In addition to the above, the EPA currently working on the design and implementation of an MRV for the electricity sub-sector as well as an MRV for the road transport sub-sector.

Institutions involved

- » What institutional arrangements allow for the flow and integration of this information?
- » What types of entities take a role in the above structures?

Lead: Environmental Protection Agency (EPA) under the Ministry of Environment, Science, Technology and Innovation (MESTI). The EPA functions as the “single national entity”. As the “single national entity” the EPA collaborates with the inventory stakeholders to undertake management of activity data and emissions factors, compilation of emission estimates from the sectors, quality control/quality assurance, improvement planning, and preparation of the reports.¹⁷

¹⁷<http://unfccc.int/resource/docs/natc/ghnbur1.pdf>

Institutional arrangements: The revised institutional arrangements involve nearly thirty experts from sixteen different public and private institutions. The roles and responsibilities of each institution and their reporting lines are arranged to reflect the levels of interlinkages contained in the respective memorandum of understanding. The MESTI is responsible for the official approval and endorsement of NIR and onward submission to UNFCCC.¹⁸ The latest functional institutional arrangements can be found in section 2.2.1 of Ghana's first Biennial Update Report.¹⁹

Case learning

Why is it good practice

- » The established Climate Change Data System is a good example of a comprehensive data system which is well-integrated into institutional structures and processes involving all key stakeholders.
- » The new institutional arrangements establish strong relationships with institutions responsible for the GHG inventories governed by the working package memorandum of understanding (EPA ACT490), which clearly outlines mandates, deliverables, and timelines.
- » The scope of this integrated system covers the GHG inventory and UNFCCC reporting requirements for BURs and NCs, NAMAs, and national policies.
- » It allows strengthening of pre-existing national and international reporting mechanisms which enable compilation and tracking data on the progress of the implementation of mitigation actions (in line with INDC targets) and support.
- » The alignment of methodologies with the national GHG inventory will facilitate accounting both at the sectoral and national level. See figure 3 illustrating proposed linkages of domestic MRV and accounting systems for INDC.
- » The software platform provides an online Climate Change Data Hub, a "one stop shop" for all climate change-related data and activities along with vast improvements in data access.

Barriers that have been overcome

[barriers that have been overcome till date]

Capacity: Lack of understanding of the detailed inventory process, reporting and accounting methodologies. A series of stakeholder meetings at the beginning of each GHG inventory cycle with all sector teams and data providers contributed to national capacity development. Continuous support is provided to national experts to attend the UNFCCC Inventory meetings and external trainings on GHG inventory.

Institutional: The previous national system was ad-hoc and mostly centred on individuals to compile data, but the absence of regular staff members made the system fragile and unsustainable.

The revised institutional arrangements, with lead/task institutions assigned to each working group and clearly defined roles and timelines, ensures coordination and effectiveness in terms of deliverables and meeting reporting deadlines. This was a result of workshop lead decision making via key stakeholders.

Information: Under the First NC and Second NC, the modality for assessing data was mostly based on informal arrangements with minimal involvement of key stakeholders who generate the data. This has been overcome in-part by the reform the existing national system for compiling climate change information at an international and domestic reporting level and merge with the existing M&E reporting structure.

¹⁸<http://unfccc.int/resource/docs/natc/ghnbur1.pdf>

¹⁹<http://unfccc.int/resource/docs/natc/ghnbur1.pdf>

Barriers to overcome

[barriers that are still present and needed to overcome]

Finance: The biggest constraint has been funding. Progress has been made in overcoming this via national budget allocations to support climate data compilation. However, there is still progress to be made on sustainable national financing systems.

Information: Difficulty and slow pace in establishing data sharing; for instance, the data compiled remains with the lead person for each sector however the MOUs now in place are acting to resolve this issue. Plans for building the capacities and constant dialogue with all relevant data handling institutions to strengthen the existing national data sharing platforms and support continuous data generation.

Under the First NC and Second NC, the modality for assessing data was mostly based on informal arrangements with minimal involvement of key stakeholders who generate the data. The long-term goal is to have Ghana Statistical Service (GSS) take the lead in data compilation, storage and archiving. The GSS is mandated legally to compile data for the country. For confidential data and in cases where data providers incurred cost in generating data, the EPA is constrained in fully assessing these data –especially information from the private sector and industries. The agencies will institutionalise the concept of contact persons by nominating and documenting all information from the appointee. Also, mainstreaming the data gathering process into the professional duties of relevant staff.

Financial The Lack of sustainable national funding coupled with project/activity specific funds such as the GEF/UNEP support for NCs and BUR preparations. These funds received were inadequate given the high costs of data generation and setting up stand-alone IT infrastructure. The strategy is to shift to core financing with possible national budget allocations to the sector ministries by fully integrating the GHG system as part of the sector ministries' work plans.

Political / Policy The EPA Act 490 provides a legal framework using MOUs as collaborative mechanisms between EPA and relevant institutions for assessing climate data and climate change related activities. However, it is weak on enforcement particularly with public institutions. It has been discussed to introduce a law or regulation to enforce EPA Act 490 to ensure ease in assessing climate data from institutions.

Quantitative information

Funding obtained

Confidential

Funding required

Confidential

Staff

[Number of staff involved in the design and implementation of the case study]

About 30 experts from 16 different public and private institutions constitute the institutional arrangements for climate change reporting.²⁰

²⁰http://unfccc.int/documentation/documents/advanced_search/items/6911.php?pref=600008881#beg

Time

[Time required to get to this stage]

3 years

Further information**Contact for enquiries**

Mr. Daniel Tutu Benefor
Environmental Protection Agency Ghana
Lead, GHG Inventory, Monitoring & Reporting Program
daniel.benefor@epa.gov.gh

Website

www.climatedatahubgh.com

References

Benefor, D, Bempah, J, & Hesse J A. (2013, January) Back-to-Back Workshop on Sustainable GHG Data Management and Establishment of MRV Data Sharing Network in Ghana, pp. 1-59. Retrieved from: http://lowemissiondevelopment.org/lecbp/docs/countries/Ghana/Back_to_back_workshop_report.pdf

Ghana EPA. (2016a). GHG Emission Portal. Available at: <http://climatedatahubgh.com/ghg-database.html>

Ghana EPA. (2016b). Domestic Electronic Registry System. Available at: <http://www.climatedatahubgh.com/ders.html>

Ghana EPA. (date unknown). Sharing Africa Experience on GHG Inventory and MRV of Emissions. Retrieved from: http://mitigationpartnership.net/sites/default/files/u1679/ghana_experiences_on_ghg-dan.pdf

Government of Ghana (2015, August). 'Climate Change Report': Ghana's Third National Communication Report to the UNFCCC, pp. 240. Retrieved from unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php

International Mitigation Partnership. (2013, August). Development of an ambitious reporting system on climate change: an integrated system for continuous data generation on greenhouse gas inventories (GHGI). Retrieved from: <http://mitigationpartnership.net/gpa/ghana%E2%80%99s-ambitious-climate-reporting-programme>

International Mitigation Partnership. (2013, October). Knowledge product: Institutional Arrangements for MRV. Retrieved from: http://mitigationpartnership.net/sites/default/files/institutional_arrangements_mrv_final.pdf

Kurukulasuriya, P. The UNDP Low Emission Capacity Building (LECB) Programme: A global initiative to support mitigation action. Retrieved from: https://unfccc.int/files/cooperation_support/response_measures/application/pdf/lecb_programme_presentation_pk_undp_no_speaker_notes.pdf

National Communication Support Programme. (2012). Country papers: Preparation of National Communications from Non-Annex I Parties to the UNFCCC - A Compilation of Lessons Learned and Experiences from selected countries. Retrieved from: ncsp.undp.org/sites/default/files/Country%20papers%20Final%20Version_1.pdf

Parliament of the Republic of Ghana (1994). Environmental Protection Agency Act, 1994, Act 490. Retrieved from: <http://www.resourcegovernance.org/sites/default/files/Environmental%20Protection%20Agency%20Act.pdf>

UNFCCC. (2015). Ghana's First Biennial Update Report, Ghana Government submission to the United Nations Framework Convention Climate Change (UNFCCC). Retrieved from: <http://unfccc.int/resource/docs/natc/ghnbur1.pdf>

UNFCCC (2016, February). Summary report on the technical analysis of the first biennial update report of Ghana submitted on 21 July 2015. Retrieved from: <http://unfccc.int/resource/docs/2016/tasr/gha.pdf>

Case study authors

Katherine Cooke, Raúl Salas Reyes and Eleanor Kilroy (Ricardo Energy and Environment)

Case study contributors

Daniel Benefor (EPA Ghana), Ximena Aristizábal, Diana Barba, and Rodrigo Villate (GIZ)



Empowered lives.
Resilient nations.



Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety