



Ghana's experiences on the application of the MPGs provisions for Chapter I (National GHG Inventory) of the BTR under the Paris Agreement

Implementation of QA/QC plan on Chapter I of the BTR

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Implementation of QA/QC plan on Chapter I of the BTR

- Ghana has developed a national QA/QC plan.
- QA/QC plan based on US EPA template.
- Implemented QC procedures in NIR 2 to NIR5 (BRT1)
- QA – review/audit by experts not involved in the inventory
- QC – routine for inventory staff

GHANA GREENHOUSE GAS INVENTORY QUALITY CONTROL AND ASSURANCE

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Report QC in Ghana's NIR5

1.9.1 Summary of QA/QC procedures

The QA/QC is an integral part of the national system, and the practices are broadly consistent with the good practices in the 2006 IPCC Guidelines. The documentation and the implementation of the QA/QC procedures are reported based on the US template EPA QA/QC measures. Inventory teams used the template to document the QA/QC activities in the inventory. The Forestry Commission has also prepared and adopted 12 Standard Operating Procedures (SOPs) to guide the land category's inventory activities. The SOPs were useful in the planning and designing of the data collection techniques for activity data and emission factors (biomass inventory)¹⁷. Despite some progress in the improvements of the QA/QC, there were still challenges in the areas relating to:

- insufficient data handling protocols in the treatment of incompatible data formats,
- secondary data without metadata,
- detection of data errors and outliers, and
- data restriction and confidential data.
- non-standardised application of experts' judgement,
- the use of tier 1 or default emission factors for key categories and
- the application of generic approaches to address sector-specific problems.

Ghana has also adopted a country-specific QA/QC plan and GHG inventory manual to address the challenges. The GHG plan clearly articulates the inventory steps, institutional responsibilities and timelines. The plan would also be used to inform the training of existing experts. The QA/QC manual¹⁸ seeks to streamline and formalise existing QA/QC procedures and communicate with a clear set of objectives to the inventory team in line with the 2006 IPCC Guidelines. These procedures ensure that the inventory system and its estimates are more transparent, credible and defensible.

1.9.3 Tier 1 QC protocols

In the inventory, Ghana implemented tier 1 QC procedures which covered checks, documentation and archiving practices the inventory compilers routinely used throughout the inventory cycle. The list of the QC procedure followed in the inventory is in Table 11.

Table 11: List of QC procedures followed in the inventory

QC Tasks	Details of QC Tasks	Responsibility
Internal consistency	Ensured that the total GHG emissions equal the sum of the individual emissions from the sectors and categories.	EPA
	Confirmed the total GHG emissions equal the sum of the emissions by gas.	EPA
	Ensured that parameters used in multiple categories (e.g., livestock population) were consistent across categories.	EPA
	Confirmed that the emissions data is reported consistently with the calculation tables in the Non-Annex 1 National Communications Reporting Guidelines.	EPA
	Confirmed that the selection and application of the estimation methods were consistent with the 2006 IPCC Guidelines.	EPA
Documentation	Created back-ups of all documentation in hard and soft copies and uploaded files to the central storage facility online.	All sectors Webmaster
	Moved all files and documentation to an "online climate change data hub".	Webmaster
Checks	Checked that assumptions and criteria for the selection of activity data and emission factors are documented	EPA
	Check that parameters and emission/removal units are correctly recorded, and appropriate conversion factors are used.	EPA
	Checked for transcription errors in data input and reference.	EPA
	Checked methodological and data changes that led to recalculations.	EPA
	Checked that emissions/removals are calculated correctly.	EPA
	Compared current inventory estimates to previous estimates, if available. If significant changes or departures from expected trends are significant, re-check estimates and explain any difference. Significant changes in emissions or removals from previous years may indicate possible input or calculation errors	EPA
	When preparing summaries, check that emissions/removals data are correctly aggregated from lower reporting levels to higher reporting levels.	EPA
	Checked that data in tables are the same as the calculation in spreadsheets and the text	EPA

Report QA in Ghana’s NIR5 (informal reviews, UNFCCC review, QA/QC workshop) – managing review comments

1.9.4 QA Procedures

Quality Assurance (QA) procedures are essential for the overall QA/QC procedures. Since QA allows the experts who have not been directly involved in the inventory to scrutinise the inventory system and the emissions to provide review comments. Ghana has undertaken extensive technical reviews of the inventory, and afterwards, the status of addressing the comments is documented with the issue-tracking template.

1.9.4.1 Third-party review of the inventory

During the preparation of the NIR4, Ghana participated in the first-ever in-country QA/QC workshop organised by the UNFCCC. QA/QC workshop produced improvement lists that Ghana included in the improvement plan. The GHG inventory chapter of the BUR was reviewed by the list of independent experts shown in Table 12. The review allowed the team to scrutinise and uncover technical issues in applying methodologies, selecting activity data, and developing and selecting emission factors by the IPCC guidelines.

Table 12: List of Experts for External Review of National Greenhouse Gas Inventory

Reviewer	Affiliation and organisation	Sector/Gas	Comments
Akyamfour Asafo Boakye Agyemang-Bonsu		All sectors	Independent expert review
Dr Chris Malley	Stockholm Environment Institute, University of York.	SLCP sectors	Under the CCAC SNAP Initiative
Brian Okoth	UNEP/UNDP Global Support Programme (GSP)	All sector	Collaboration with UNEP

Table 13: Status of issues/comments identified by TTE during the ICA of BUR2

Sector	Comments from the TTE	Action taken	Status
IPPU	Reporting the F-gases on a mass basis in the summary tables.		
LULUCF	Consistency in the values reported across tables in the BUR and the NIR, especially CH ₄ emissions from category 3. B		
General	The use of notation keys was not always consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties		
LULUCF	Report comparable information addressing the tables included in Annex 3A.2 to the IPCC good practice guidance for LULUCF.		
IPPU	Provides additional information on the use of limestone in cement as a flux.		
General	Setting a key category threshold to 95 per cent and clearly explaining the reasons for selecting the base year for the trend analysis would facilitate a better understanding of the information reported.		

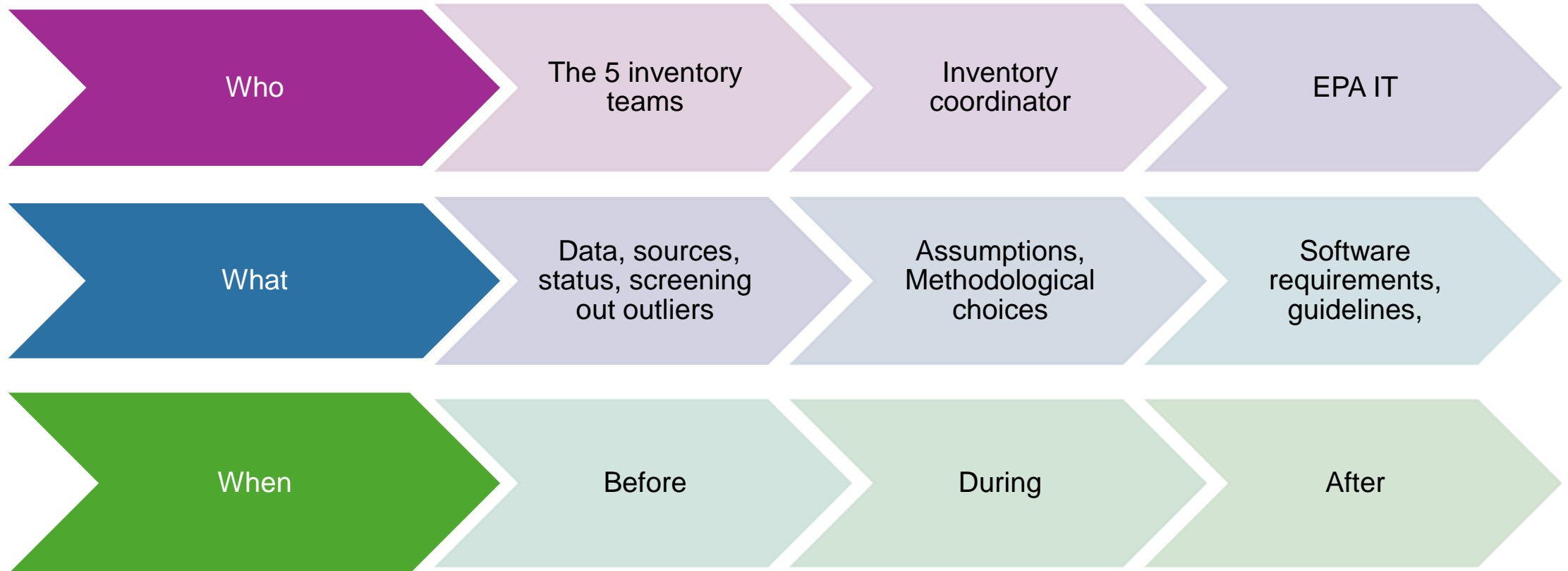
QA/QC Workshop

In March 2018, Ghana participated in the QA/QC workshop on the National Greenhouse Gas Inventory Management System and National Greenhouse Gas Inventories organised in Ghana by the UNFCCC. The workshop ended with a prioritised improvement list that would be implemented to enhance the national system's functionality. Table 14 contains the main recommendations for implementation in the BUR2 and BUR3. In the NIR4, Ghana reported progress in addressing the recommendations.

Implementation of QA/QC – example of our documentation approach

- We keep it simple, but we aim at consistent improvement.
- We've clearly defined:
 - why do we need documentation
 - what to document
 - how to document
 - who to document
 - where/how to store and retrieve
- This means we've to put it in place the following:
 - roles and responsibilities for documentation
 - simple procedures to guide “what and how” documentation
 - develop or adopt template documentation
 - system for storage and retrieval
 - Identify means for continuous improvements

Implementation of QA/QC – Who documents/archives what?



Thank you for listening