REPUBLIC OF MALAWI
Ministry of Natural Resources

REPUBLIC OF MALAWI
Ministry of Natural Resources, Energy and Mining

REPUBLIC OF MALAWI
Ministry of Natural Resources, Energy and Mining

Final Report on Lessons Learned and Key Achievements of Malawi's NDC Tracking Framework Project

Development of a Framework for Tracking Nationally Determined Contributions for the Republic of Malawi

Activity 4 Final Summary Report

30th August 2024

Supported by Implementing Partners:

RICARDO
Member of WSP

Final Summary Report on Lessons Learned and Key Achievements of Malawi's NDC Tracking Framework Project.

Activity 4 Final Summary Report: Inclusive of ICAT Deliverables 2.5, 3.6 and 4.1

9th February 2026

AUTHORS

Yamikani Idriss (ICAT Malawi Project Co-ordinator, Environmental Affairs Department, Ministry of Natural Resources), Dr Suzgo Kaunda (ICAT Malawi National Consultant),

Supported by ICAT Implementing Partners: Charis Evans, Dominic Sheldon, Sabina Shaikh (Ricardo Energy & Environment).

PREPARED UNDER

The Initiative for Climate Action Transparency (ICAT), supported by Austria, Canada, Germany, Ireland, Italy, and the Children's Investment Fund Foundation.

Table of Contents

1. Introduction & Project Outcomes 4
1.1. Introduction 4
1.2. Project overview 4
1.3. Project outcomes, outputs and deliverables 5
2. Validation Workshop Outcomes 6
2.1. Summary of validation workshop discussions 6
2.2. Key agreements and consensus 6
2.3. Additional feedback or concerns 7
2.4. Stakeholder commitments 7
3. Lessons learned and best practices 8
3.1. Technical lessons learned 8
3.2. Institutional lessons 8
3.3. Stakeholder engagement lessons 9
3.4. Process & implementation lessons 9
4. Recommendations for future work 10
4.1. Recommendations for future work 10
4.2. Recommendations for future ICAT support 11

1. Introduction & Project Outcomes

1.1. Introduction

This report presents a comprehensive synthesis of the lessons learned from the Initiative for Climate Action Transparency (ICAT)–supported project on strengthening Malawi's systems for tracking progress toward its Nationally Determined Contributions (NDCs). The project was designed to enhance national capabilities for monitoring mitigation actions, developing greenhouse gas (GHG) projections, and assessing the impacts of policies and measures across the energy, agriculture, and transport sectors - three priority sectors central to Malawi's climate commitments and NDC targets.

A core component of the project was the validation of methodologies, data inputs, modelling assumptions, and sectoral projections, undertaken through a structured validation workshop with national stakeholders. This workshop provided an opportunity to collectively review the draft results, confirm the appropriateness of modelling approaches (including the use of the GACMO tool), finalise indicator sets, and identify gaps and priority actions for improvement. The validation process also played a key role in strengthening stakeholder ownership and enhancing institutional understanding of the modelling outputs and their implications for NDC tracking.

Through collaborative modelling exercises, targeted capacity-building activities, and the validation process, the project generated a series of analytical outputs and methodological advancements that contribute meaningfully to Malawi's broader climate transparency agenda. This report consolidates those outputs, summarises the technical discussions held throughout the process, and documents insights related to data systems, institutional coordination, sector readiness, and opportunities for enhancing the robustness of future NDC tracking.

In addition to detailing the project's technical achievements, the report also highlights capacities strengthened across institutions, challenges encountered, and areas requiring further development. The lessons and best practices identified herein aim to inform future national efforts, including the preparation of the second Biennial Transparency Report (BTR2) and the revision of Malawi's NDC (NDC 3.0), supporting a more transparent, accurate, and country-driven climate reporting system.

1.2. Project overview

The ICAT-supported NDC Tracking Framework Project was implemented to strengthen Malawi's national capacity to track, assess, and report progress towards its Nationally Determined Contribution (NDC) in line with the Enhanced Transparency Framework (ETF) of the Paris Agreement. The project was led by the Environmental Affairs Department (EAD) under the Ministry of Natural Resources and Climate Change, with technical support provided through the Initiative for Climate Action Transparency (ICAT) and implementing project partners Ricardo.

The project was designed to respond to Malawi's evolving transparency needs following the submission of its updated NDC in 2021 and the preparation of its First Biennial Transparency Report (BTR1). It focused on establishing practical, country-owned systems for tracking mitigation actions, assessing greenhouse gas (GHG) impacts of policies and measures, and developing emissions projections to support both domestic decision-making and international reporting obligations.

The priority sectors of energy, transport, and agriculture, were selected based on their significant contribution to Malawi's emissions profile and their central role in achieving Malawi's NDC targets. The project combined technical analysis with institutional capacity building, emphasising sector-led

ownership, alignment with existing national systems, and applicability to future biennial reporting cycles, including the 2026 BTR2.

1.3. Project outcomes, outputs and deliverables

Project outcomes

The project delivered several strategic outcomes that strengthen Malawi's climate transparency architecture, including:

a) Strengthened national capacity in GHG emissions modelling, including use of GACMO modelling tool, construction of scenarios, policy assessment, and emissions reduction (NDC) indicator refinement/review.

b) Improved national capacity to assess and track mitigation actions using internationally recognised methodologies, including the ICAT Policy Assessment Guides and the GHG Protocol Policy and Action Standard.

c) Enhanced ability of sector institutions to develop and interpret GHG emissions projections and policy impact estimates relevant to NDC implementation.

d) Strengthened alignment between GHG inventories, projections, NDC tracking, and biennial transparency reporting, supporting more consistent and credible reporting under the ETF.

e) Increased cross-sectoral collaboration and shared understanding of roles in NDC tracking and climate reporting.

Key outputs and deliverables

The project generated a suite of technical and institutional outputs, including:

a) **Guidance report on GHG impact assessment of policies and measures**, documenting the application of "with policy" and "without policy" scenarios for selected NDC measures in the energy, transport, and agriculture sectors.

b) **A framework for GHG emissions projections**, including sector-specific BAU and mitigation scenarios developed using the Greenhouse Gas Abatement Cost Model (GACMO), with documented country-specific assumptions and data sources.

c) **An enhanced NDC Tracking Framework**, comprising refined mitigation indicators, clarified institutional responsibilities, and practical tools to support routine tracking of NDC implementation.

d) **Operational modelling and tracking tools**, including a consolidated GACMO model file and a complementary Excel-based NDC tracking workbook to capture indicators not represented in the GACMO modelling tool.

e) **Capacity-building workshops and technical working sessions**, delivered to sectoral working groups to strengthen hands-on skills in modelling, data management, and transparency reporting.

f) **Validation workshops**, ensuring stakeholders reviewed, provided technical verification, and national endorsement of methodologies, results, and proposed tracking enhancements.

Collectively, these outputs provide Malawi with a practical foundation for sustained NDC tracking and biennial transparency reporting, supporting near-term processes such as BTR2 preparation and the forthcoming revision of the NDC (NDC 3.0).

2. Validation Workshop Outcomes

2.1. Summary of validation workshop discussions

During the consultations and technical working sessions, stakeholders across the energy, transport and agriculture sectors reiterated the importance of strengthening Malawi's capacity for GHG projections and mitigation modelling. Participants highlighted the progress achieved through collaborative refinement of activity data, clarification of sector-specific mitigation measures, and alignment of key modelling assumptions across sectors, which together contributed to a more coherent and transparent modelling process.

Stakeholders noted that the GACMO modelling exercise significantly improved transparency and consistency in sectoral projections, while also serving as an accessible entry point for building modelling literacy among new and existing sectoral working group members. However, participants consistently emphasised systemic challenges – most notably the limited availability or disaggregated sectoral data, inconsistencies across data sources, and gaps in national data governance frameworks.

A significant focus of the validation workshop discussions was the finalisation of the indicator set, which was structured into headline and supporting indicators. Stakeholders recognised that the headline indicators were aligned closely with the GACMO tool to ensure consistency between modelling outputs and national tracking needs. To extend monitoring capacities beyond what GACMO can currently accommodate, a supplementary excel-based tracking tool was developed throughout the project. This supplementary tool intended to support broader indicator monitoring, particularly for areas not fully captured within GACMO.

Institutional strengthening emerged as a recurring theme, with representatives emphasising the need for improved coordination, clearer roles in data management, and regular updating of sectoral statistics. Stakeholders also expressed strong interest in sustained capacity-building, particularly new technical staff and those who had not participated in GACMO or GHG modelling training activities previously.

During the validation workshop, participants emphasised that adaptation received comparatively limited attention in the current phase of the project. This was attributed to several factors: the limited time remaining on the project, the prioritisation of the three identified mitigation sectors, and importantly the lack of clarity regarding the status of the National Adaptation Plan (NAP) development process. Because adaptation monitoring, evaluation and learning (MEL) frameworks are expected to align with the NAP, uncertainty around NAP progress constrained the extent to which adaptation indicators and methodologies could be addressed. Stakeholders highlighted this as a critical area requiring future development, noting that adaptation MEL could merit a dedicated future initiative.

2.2. Key agreements and consensus

Several areas of consensus were reached across the stakeholder working groups, validating the findings and shaping the next steps for improving Malawi's GHG projections and NDC tracking systems:

1. ~~Endorsement~~ Recommendation of the methodological approach: Stakeholders ~~agreed~~ recommended that the methodology used for generating the GACMO projections is technically robust and appropriate for Malawi's current modelling landscape.

2. Recognition of GACMO as a viable baseline tool: Participants acknowledged that while the tool requires further customisation for sector-specific needs – particularly for the agriculture sector – it provides a strong foundation for NDC 3.0 preparation.

3. Validation of identified gaps: The data, institutional, resource and compatibility gaps identified

during the modelling process were formally acknowledged as accurate and reflective of some broader national capacity barriers.

4. Support for a centralised national data system: Stakeholders expressed strong agreement on the need to establish a harmonised, standardised platform for storing, managing and regularly updating climate-relevant data

5. Endorsement of continued capacity-building priorities: There was consensus around the need for continuous and expanded technical training, continuous institutional support, and the creation of permanent modelling and data management roles within relevant ministries.

2.3. Additional feedback or concerns

Additional issues raised by stakeholders during the validation workshop included:

a) **A need for clearer national modelling guidance:** Calls were made for standardised modelling protocols, including agreed-upon assumptions, growth rates, and scenario structures.
b) **Data-sharing uncertainties:** Institutions requested clearer mandates and formal agreements governing data ownership, sharing and validation.
c) **Coordination challenges:** Participants highlighted the need for stronger inter-institutional coordination to avoid duplication and ensure consistent data flows.
d) **Sustainable funding concerns:** Stakeholders emphasised the need for dedicated long-term financing for data governance, modelling maintenance, and capacity development.
e) **Mode of training/capacity building:** Participants voiced concern on use of online training that it was not effective in delivery of lessons and practice. They recommended a blended online and face to face modes of training for optimal engagement and learning.
f) **Data collection:** Participants noted that there is need to strengthen systematic data collection mechanisms to address data gaps and quality issues.

2.4. Stakeholder commitments

Across then project workshop sessions and consultations, stakeholders expressed clear commitments to supporting and strengthening Malawi's GHG projection and reporting process. Key commitments included:

a) **Enhanced participation and data provision:** Institutions committed to continuing active engagement in sectoral working groups and providing updated, accurate data as it becomes available.
b) **Improving internal data systems:** Several ministries suggested the need to strengthen their internal data management practices.
c) **Support the development of a centralised national data platform:** Stakeholders affirmed readiness to collaborate with lead institutions (e.g. the EAD) in designing and operationalising a unified national data repository.
d) **Institutionalising modelling and MRV responsibilities:** Many agencies committed to identifying focal persons or units to oversee modelling, MRV and data management tasks, ensuring continuity and reducing reliance on project-based support.
e) **Participating in future capacity-building activities:** Stakeholders expressed willingness to join advanced GACMO training, methodological workshops, and cross-sector learning exchanges to build a more skilled national modelling network
f) **Contributing to future NDC updates:** Institutions pledged to support the refinement of sectoral mitigation measures and assumptions to ensure that the NDC 3.0 reflects realistic, evidence-based and country-owned projections.

These commitments reflect strong willingness among stakeholders to collaborate in advancing Malawi's

climate transparency agenda and strengthening the technical foundations required for future reporting under the ETF.

3. Lessons learned and best practices

3.1. Technical lessons learned

Stakeholders gained practical experience in applying the workflow set out in the Policy and Action Standard and ICAT's Policy Assessment Guides as a structured approach for tracking mitigation actions under Malawi's NDC. Through hands-on application, stakeholders strengthened their understanding of how to move systematically from defining policies and measures to selecting indicators, developing emissions projections, and assessing progress over time in a manner consistent with international good practice.

Through the project, stakeholders enhanced their ability to situate this workflow within a broader methodological framework that integrates policy analysis, emissions modelling, and institutional processes. Stakeholders developed stronger skills in translating policy objectives and implementation plans into causal chains that clearly link interventions to expected outputs, outcomes, and emissions impacts. This improved the selection of indicators that are relevant not only for modelling purposes, but also for tracking implementation progress and informing national reporting.

Stakeholders also built capacity to operationalise the quantification steps of the workflow using the GACMO model. This included developing consistent "with policy" and "without policy" scenarios across sectors, applying harmonised assumptions, and interpreting modelling outputs in a way that directly supports NDC tracking needs. As a result, stakeholders were better able to use emissions projections to populate structured reporting outputs, including tables required for tracking progress in implementing and achieving the NDC under Article 4 of the Paris Agreement.

Importantly, stakeholders strengthened their understanding of the institutional and data-related requirements that underpin effective application of the workflow. The project improved clarity on roles and responsibilities for data collection, modelling, quality assurance, and reporting across ministries, and increased familiarity with the use of standardised templates and documented methodologies. This has enhanced stakeholders' confidence in maintaining and updating emissions projections and tracking results beyond the lifetime of the project.

Overall, stakeholders gained a more holistic understanding of NDC tracking as an iterative and integrated process, rather than a standalone modelling exercise. By applying the ICAT Policy Assessment Guide and Policy and Action Standard workflow within a broader methodological approach, stakeholders are now better equipped to adapt methods as data availability improves, policies evolve, and future transparency requirements become more demanding.

3.2. Institutional lessons

Stakeholders learned the importance of establishing data governance arrangements early when applying the Policy and Action Standard workflow. In practice, the project highlighted the need for clear designation of lead institutions for each indicator, consistent with the Standard's emphasis on assigning institutional responsibility for data collection, monitoring, and reporting. The experience also demonstrated the value of standardised data-sharing protocols to support timely and consistent data flows into modelling and tracking processes.

The application of the workflow further showed that sufficient time is required to pilot modelling tools and test data inputs before full implementation. Stakeholders observed that allocating additional time for these steps would further support the verification of activity data, assumptions, and indicator definitions prior to their use in emissions projections and policy impact assessment, as envisaged under the Policy and Action Standard.

From a data collection perspective, delays in receiving feedback and data submissions from some sector institutions affected implementation timelines and required repeated follow-ups. This experience reinforced the importance of clearly defined feedback timelines, stronger internal coordination within sectors, and earlier engagement of all relevant departments involved in indicator implementation, in line with the Standard's guidance on institutional arrangements and coordination.

Stakeholders also recognised that parallel climate-related projects implemented by the Environmental Affairs Department would benefit from closer coordination to ensure methodological consistency. The experience highlighted the risk that uncoordinated initiatives may apply different assumptions or indicators and underscored the value of aligning project workflows and data requirements. For example, there was an opportunity for closer collaboration between the NDC-3 revision team and the ICAT-supported project.

Finally, the project revealed the need for increased awareness within sector institutions regarding NDC objectives, sector-specific roles, and reporting requirements. Not all implementing units were fully familiar with NDC indicators or their responsibilities within the tracking framework, which affected data availability. Stakeholders identified targeted awareness-raising within sectors and the formal designation of NDC data focal persons as important institutional measures to support effective application of the Policy and Action Standard workflow and to ease future NDC tracking efforts.

3.3. Stakeholder engagement lessons

Strong engagement across ministries through sector working groups led by team leads, improved access to sectoral data and technical inputs. Sector led implementation enabled stakeholders to take ownership of data collection, modelling, and reporting processes. Effective coordination between the data collection team, sector focal points, and technical partners ensured timely implementation of project activities. Standardized tools and templates enhanced data consistency and quality across sectors. Structured workshops and hands on technical sessions facilitated progressive skill building and immediate application of tools.

3.4. Process & implementation lessons

The experience showed that while GACMO training was effective in introducing the modelling framework, online training alone was insufficient for optimal engagement and learning. Remote delivery limited opportunities for real-time practice, peer learning, and iterative problem-solving. More face-to-face, hands-on training sessions would have supported deeper understanding of modelling steps and more effective application of tools during project implementation.

The project also demonstrated the importance of adapting implementation approaches to prevailing in-country conditions. Flexible communication and engagement approaches helped maintain momentum during periods of remote delivery. However, increased in-country presence and face-to-face engagement during key phases would likely have accelerated alignment, decision-making, and technical progress.

The experience further highlighted the need for clear definition of roles, responsibilities, and expectations at project outset. Ambiguities in task ownership and sequencing increased coordination demands during implementation. More explicit scoping of activities and clearer division of responsibilities between implementing partners and national counterparts would support more efficient

delivery.

Finally, the project underscored the importance of sustained availability and engagement of technical experts throughout implementation. More consistent expert engagement would have supported timely guidance, review of outputs, and earlier completion of key activities and deliverables.

4. Recommendations for future work

4.1. Recommendations for future work

Future work should focus on fully embedding NDC tracking functions within existing government systems, particularly within the Environmental Affairs Department (EAD) and sector ministries. This includes formalising roles and responsibilities for data collection, modelling, quality assurance, and reporting through official mandates or standard operating procedures. Clear institutional ownership will reduce reliance on ad-hoc project arrangements and improve continuity beyond project cycles.

Persistent challenges related to incomplete, inconsistent, and fragmented sectoral data underscore the need for a strengthened national data governance framework. Future efforts should prioritise:

a) Development of standardised data-sharing protocols across ministries and agencies.

b) Regular updating of sectoral statistics aligned with GHG inventory and NDC tracking needs.

c) Improved coordination between national statistical systems, sectoral databases, and climate reporting processes.

Addressing these gaps will significantly improve the robustness of GHG projections and NDC progress assessments.

While the project substantially improved national capacity in GHG projections, mitigation modelling, and policy impact assessment, this capacity requires sustained reinforcement. Future work should include:

a) Regular refresher and advanced training for existing staff.

b) Structured onboarding and training for new technical personnel.

c) Increased emphasis on in-person, hands-on training sessions to complement remote support, particularly for complex modelling and troubleshooting tasks.

Future work should strengthen the linkage between GHG inventory development, emissions projections, policy impact assessment, and NDC tracking. Ensuring methodological alignment across these processes will enhance internal consistency and reduce duplication of effort. This integration is particularly important for supporting Biennial Transparency Reports (BTRs), future National Communications, and the revision of Malawi's NDC (NDC 3.0) .

While the ICAT project prioritised the energy, transport, and agriculture sectors, future work should progressively expand modelling and tracking to additional sectors such as waste and IPPU. This expansion should be accompanied by efforts to:

a) Refine sector-specific assumptions.

b) Improve representation of non-energy emissions.

c) Develop country-specific parameters where data availability allows, to reduce reliance on default assumptions.

The project highlighted the risk of parallel climate initiatives applying differing assumptions, indicators, or methodologies. Future work should strengthen coordination between NDC tracking, NDC revision processes, transparency initiatives, and climate finance planning to ensure coherence and efficient use

of resources. Establishing routine coordination mechanisms across projects and teams will help maintain methodological consistency and maximise impact .

4.2. Recommendations for future ICAT support

As Malawi enters the next biennial transparency cycle, with BTR2 due in 2026 and subsequent reporting every two years thereafter, continued and targeted ICAT support would be instrumental in consolidating gains achieved to date and ensuring the sustainability of national transparency systems.

a) **Support institutionalisation of biennial transparency processes:** Future ICAT support should prioritise embedding BTR preparation as a routine, nationally led process rather than a project-based exercise. This includes strengthening linkages between GHG inventories, emissions projections, policy impact assessment, and NDC tracking to ensure that future BTRs can be produced efficiently, consistently, and on schedule. Targeted support during the transition from BTR1 to BTR2 would help Malawi operationalise lessons learned and reduce reporting risks.

b) **Enhance continuity between NDC implementation and BTR reporting:** ICAT Phase 2 support should focus on strengthening the use of BTRs as an operational tool for tracking NDC implementation. This includes aligning indicators, assumptions, and sectoral data used for NDC tracking with those required for biennial reporting under the Enhanced Transparency Framework. Strengthened continuity will ensure that BTRs directly inform policy decision-making and future NDC updates, including the preparation of NDC 3.0.

c) **Consolidate and operationalise modelling and tracking tools:** Further ICAT support should assist Malawi in moving from initial application of tools such as GACMO towards their sustained operational use across reporting cycles. This includes refining workflows for updating BAU and mitigation scenarios, maintaining tracking inputs over time, and ensuring that modelling outputs can be readily translated into BTR narratives and common tabular formats. Emphasis should be placed on maintaining methodological consistency across successive BTRs.

d) **Strengthen national capacity for iterative reporting cycles:** Given the recurring nature of BTR submissions, ICAT support should prioritise long-term capacity retention and institutional memory. This includes mentoring national experts, supporting handover mechanisms for staff turnover, and reinforcing in-country technical leadership. Increased emphasis on practical, hands-on support—particularly during reporting years—would enhance national ownership and reduce dependence on external technical assistance over time.

e) **Support progressive expansion of sectoral coverage:** Finally, ICAT support could assist Malawi in gradually expanding the scope and depth of analysis beyond the initial priority sectors, in line with increasing national capacity. This would support improved completeness and robustness of future BTRs and enable Malawi to progressively enhance the transparency and ambition of its climate reporting over successive biennial cycles.