



Food and Agriculture
Organization of the
United Nations

The Nationally Determined Contributions Tracking Tool

USER MANUAL







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Abbreviations and acronyms

AFOLU	agriculture, forestry and other land use
AR5	IPCC Fifth Assessment Report
BAU	business-as-usual
BTR	Biennial Transparency Report
ETF	Enhanced Transparency Framework
FAO	Food and Agriculture Organization of the United Nations
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
LTS	Long-Term Strategy
LULUCF	land use, land-use change and forestry
MPGs	Modality Procedures and Guidelines
NDC	nationally determined contributions
NIR	national inventory report
P&Ms	policies and measures
PA	Paris Agreement
UNFCCC	United Nations Framework Convention on Climate Change

Chemical formulae

CH₄	methane
CO₂eq	carbon dioxide equivalent
FCs	fluorocarbons
HFCs	hydrofluorocarbons
N₂O	nitrous oxide
NF₃	nitrogen trifluoride
PFCs	perfluorocarbons
SF₆	sulphur hexafluoride
tCO₂e	tonnes of carbon dioxide equivalent

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1. Introduction

Achieving the collective target set by the Paris Agreement (PA) relies on the effective implementation of consecutive and increasingly ambitious nationally determined contributions (NDCs). Regular tracking of progress toward implementing and achieving each NDC is a key step in assuring effectiveness. This regular tracking is needed to identify implementation gaps and needs for achieving NDC targets. During the tracking process, decision makers may agree to continue, enhance or discontinue ongoing actions. They may also identify additional efforts that are needed to be taken by the end of an NDC implementation period or new sets of actions to be pursued through the subsequent NDC.

Such an approach responds to the requirements of the **Enhanced Transparency Framework (ETF) of action** which demands frequent, quality, and transparent reporting over time. To operationalize the ETF, the Katowice Climate Package¹ adopted the Modalities Procedures and Guidelines (MPGs) (Decision 18/CMA.1).² The MPGs set out key elements of the Biennial Transparency Report (BTR), the new reporting requirement starting from 2024, at the latest (excluding least developed countries and small island developing States). The main elements of the BTR include: (i) a national inventory report (NIR) of anthropogenic emissions and removals, prepared using methodologies recommended by the Intergovernmental Panel on Climate Change (IPCC, 2006) and (ii) **information necessary to track progress made in implementing and achieving their NDC**. In chapter III of the MPGs, guidance on different approaches and methodologies for tracking the implementation and achievement of NDCs are elaborated, providing information on the indicators and data required to track the NDC progress based on national circumstances.

However, tracking progress in implementing and achieving NDCs in a transparent and comparable way is a challenging task. This is oftentimes due to the overall lack of sufficient information on the implementation progress of NDCs actions (Graichen *et al.*, 2018), as well as incomplete national greenhouse gas inventories (for example, not covering NDC action sectors), which are fundamental tools for tracking progress toward mitigation actions. Following Decision 4/CMA.1,³ many countries significantly improved clarity of the information necessary to track progress in their updated NDCs (FAO, 2021; UNFCCC, 2021). However, further improvement is needed in terms of data required and technical capacity to fully comply with the ETF requirements, in the first BTR and the consecutive ones.

Furthermore, in the first BTR which contains information on the end year of the NDC (MPGs, paragraph 70), countries are required to assess whether they have achieved the targets of their NDCs. This actually means: the second BTR (submission of 2026) for countries which submitted the first by 2024 and with 2025 as the end year of NDC implementation; and the fifth BTR (submission of 2032) for countries with 2030 as the end of their NDC implementation and which respected the previous two

¹ More information on the Katowice Climate Package: <https://unfccc.int/process-and-meetings/the-paris-agreement/katowice-climate-package>

² More information on the decision 18/CMA.1: <https://unfccc.int/documents/193408>

³ Decision 4/CMA.1 Further guidance in relation to the mitigation section of decision 1/CP.21.

deadlines. Even though the MPGs outline the information required, approaches, methodologies, and flexibility clauses, including in the scope, frequency and level of detail of reporting on NDCs, the extent to which these requirements will be adopted depends on several factors including the availability of data on selected indicators, the understanding of NDC and national policy linkages, the time and level of implementation as well as the availability of details on resources and modalities of implementation (carbon market, national or international funding, and so on). Tracking progress can therefore be a time-consuming exercise which requires considerable technical capacity, often not readily available.

Considering many countries currently experience data gaps, insufficient monitoring systems and limited national capacities to track NDC implementation and progress, the Food and Agriculture Organization of the United Nations (FAO) developed the NDC Tracking Tool. The tool provides a multi-sectorial modular approach to support countries in collecting the information required to address the elements of the chapter III of the MPGs and in alignment with the common tabular formats (CTB). Based **on available information in each country, the tool allows to assess NDC implementation progress**. As such, the tool aims to support countries to meet the ETF requirement on NDC reporting, inform country-level NDC enhancement planning, as well as contribute to the review of collective progress towards achieving the global goals of the PA under the Global Stocktake.

1.1 What is the NDC Tracking Tool?

The NDC Tracking Tool is an Excel-based, easy-to-use tool, which is designed to facilitate countries in collecting the information required to track progress made in implementing and achieving their NDCs. Based on the information available in each country, the tool allows assessing the progress on NDC implementation by (i) comparing planned versus implemented mitigation and adaptation actions, and (ii) estimating the GHG reduction achieved from the implementation of mitigation actions comparing against the sectoral and/or national baseline and NDC target scenario.

The tool is designed to support governments, national experts and practitioners involved in the preparation, implementation, updating, revision, and reporting of all sectors covered by the NDC.

The NDC Tracking Tool presents several characteristics:

- Monitors the implementation of NDC mitigation actions, adaptation actions and adaptation with mitigation co-benefits.
- Facilitates data collection.
- Tracks the contribution of planned, adopted, and implemented mitigation actions aimed at achieving national/sectoral and subsectorial mitigation targets.
- Prevents double accounting and overlap of mitigation actions (for example, cross-sectoral actions).
- Allows the identification of mitigation contributions proposed under the country's Long-Term Strategy (LTS) and other innovative actions as potential options for NDC enhancement.
- Distinguishes results of mitigation actions linked to the carbon market from national GHG emission reduction targets.



2. Structure and methodological approach

The NDC Tracking Tool is structured in five modules, in addition to a result and dashboard sections. The tool is designed according to the requirements of the Modalities, Procedures and Guidelines (MPGs), particularly chapter III, section B, section C, section D and chapter IV (Decision 18/CMA.1). The approach adopted by this tool is also based on the complementary information from the decision 4/CMA.1 as well as the decision 5/CMA.3 which provide more guidance for reporting on mitigation actions and the common tabular formats to support the electronic reporting of NDCs.

According to chapter III section C, tracking the progress of an NDC shall be based on the indicator(s) that each country identifies as relevant to its NDC target. Indicators may be either qualitative or quantitative. For example, if the selected indicator is the country's net GHG emissions and removals (quantitative), the country must compare the most recent GHG emissions and removals covered by the NDC to the level before the implementation period (MPGs, paragraph 65). See Table 1 below for examples of quantitative GHG indicators.

Table 1. Type and examples of indicators for a greenhouse gas type of target and tracking approach according to chapter III section C of the Modality Procedures and Guidelines

	Type of Indicator	Example of indicator	Tracking progress	Considerations
Quantitative	Net emissions and removals. ⁱ	Reduce emissions by approximately 64.6 million tCO ₂ e/year by 2030 (Cambodia NDC, 2020). ⁱⁱ	Actual emissions and removals at the reporting year ≤ GHG emissions target levels = Target achieved. Actual emissions and removals at the reporting year > GHG emissions target levels = Target not achieved.	Must ensure the consistency of methodology, scope, and metrics of NDC tracking with submitted NDC (MPGs paragraph 76, and decision 4/CMA.1, annex II, paragraph 2).
	Percentage reduction of GHG intensity. ⁱⁱⁱ	40% reduction in per-capita GHG emissions below business as usual by 2030 (Zimbabwe NDC, 2021). ^{iv}	Actual GHG per-capita in the reporting year ≤ GHG intensity target levels = Target achieved. Actual GHG per capita in the reporting year > GHG intensity target level = Target not achieved.	Must ensure the consistency of methodology, scope, and metrics of NDC tracking with submitted NDC (MPGs paragraph 76, and decision 4/CMA.1, annex II, paragraph 2).

Notes:

ⁱ National greenhouse gas emissions and removals from national inventories covered by the NDC.

ⁱⁱ **Cambodia Ministry of Environment (MoE), National Council for Sustainable Development (NCSDD)**. 2020. Cambodia's Updated Nationally Determined Contribution (NDC). https://ncsd.moe.gov.kh/resources/document/Cambodia_NDC_Updated

ⁱⁱⁱ Reduction in GHG emissions per unit of GDP or population.

^{iv} **Zimbabwe Minister of Environment, Climate, Tourism and Hospitality Industry**. 2022. *First Nationally determined Contribution (NDC) (Updated submission)*. <https://unfccc.int/documents/498054>

Source: Author's own elaboration.

Quantitative indicators may also refer to measurable parameters other than GHGs, provided the underlying methodology and assumptions used to estimate the consequent GHG emission reductions or GHG removals increases is described and reported. Furthermore, qualitative indicators may be used which must be tracked in terms of implementation progress. See table 2 below for examples of both indicators.

Table 2. Type and examples of indicators for a non- greenhouse gas type of target and tracking approach according to chapter III section D of the Modality Procedures and Guidelines

	Type of Indicator	Example of indicator	Tracking progress	Considerations
Qualitative	Qualitative indicator of a policy and measure.	Participatory environmental management of resources and land use (Argentina, 2022). ⁱ	Assign an implementation percent progress.	Countries shall clearly indicate and report its accounting approach (MPGs, paragraph 86).
Quantitative	Other indicators.	Increase of forest cover to 12.9% of the territory of Armenia by 2030 (Government of the Republic of Armenia, 2021).	Wetland cover in reporting year compared to the wetland cover in starting year. Estimate the GHG impact of the action (MPGs, paragraph 85).	Must describe the methodologies and assumptions used to estimate the GHG emission (MPGs, paragraph 86).

Notes:

ⁱ **Argentina Presidency.** 2022. Second NDC (Updated submission). <https://unfccc.int/documents/497046>

Source: Author's own elaboration.

Chapter III section D of the MPGs provides further guidance for tracking single mitigation policies and measures (P&Ms), actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans supporting the implementation of an NDC. In this manual, all these actions are referred to as P&Ms. To track NDC progress based on countries P&Ms, countries must focus on the P&Ms with significant impacts on the national GHG emissions and removals. Additionally, countries are required to provide, to the extent possible, estimates of expected and achieved GHG emission reductions from the implementation of P&Ms (MPGs, paragraph 85). This implies that in order to effectively assess the progress made in terms of avoided GHG emissions or increased GHG removals deriving from the implementation of P&Ms, actions and plans, similarly, to chapter III section C, countries should strive to identify quantitative indicators to the extent possible.

The NDC Tracking Tool proposes both methodological approaches described in chapter III section C and section D of the MPGs. The choice of the appropriate methodology for each country depends on multiple factors, including the type of mitigation commitment in the NDC, the availability of data to track progress as well as the technical and financial resources available. Furthermore, the tool applies the following considerations to further facilitate the tracking of NDC implementation and progress:

- An additional qualitative metric is proposed as a rate of implementation performance based on the assessment of the implementation entity.

- The progress toward achieving an NDC using inventory-based tracking only refers to the GHG related indicators associated with GHG targets.
- The non-GHG mitigation actions provided in an NDC (either intended as means to achieve the GHG target or as sectorial actions separate from the GHG target) are considered as P&Ms. The P&Ms - based tracking approach is recommended to track the progress towards the implementation of mitigation actions and their contribution to achieving the NDC goal.
- The P&Ms - based tracking refers to the contribution of the mitigation action in terms of emissions reduction compared to the NDC target.

2.1 Performance of the NDC implementation

The tool assumes that the implementation of the NDC progresses linearly during the implementation period. It then calculates the percentage of “expected progress” (or rate of implementation) for each indicator at the year of tracking as the cumulative progress to date based on the current date and the period of implementation (end year minus start year) (equation 1). Thus, the full implementation of the NDC is only expected at the end year of the NDC. Even when an NDC target is reached prior to the end year, the tool still calculates the expected progress for the tracking year as the cumulative percentage of the NDC progress at the year of tracking.

For example, if current year is 2022, start year is 2010 and end year is 2040, then expected progress in 2022 is $(2022-2010) \times 100 / (2040-2010) = 40$ percent.

Equation 1.

$$\text{Expected progress (\%)} = \frac{\text{current year} - \text{start year}}{\text{end year} - \text{start year}} \times 100$$

However, in “current year” progress in implementing NDCs may be slower than expected. So, in order to estimate “achieved progress”, the user (for example, a person involved in the implementation process on matters such as planning, implementation, review and update of the NDC) must first assign an implementation performance value to each indicator (actual implementation progress). Possible values vary from 10 percent (low progress achieved) to 100 percent (fully implemented). The case of an expected progress beyond the scheduled one is not taken into account.

The achieved progress is then calculated as the percentage of the implementation progress against the expected progress (equation 2).

Equation 2.

$$\text{Achieved progress (\%)} = \text{Expected progress (\%)} \times \text{actual implementation progress (\%)}$$

The above approach allows to assess the implementation progress of all type of indicators - either quantitative or qualitative - for both mitigation and adaptation actions and for all sectors.

A particular policy or measure can have multiple indicators. Therefore, the tool calculates total progress for each P&M as the mean of all indicators related to that P&M and by sector.

2.2 Tracking of policies and measures

2.2.1 NET EMISSION REDUCTION RESULTING FROM IMPLEMENTATION OF POLICIES AND MEASURES

To assess the impact of implemented policies and measures (P&Ms), the tool considers four stages of implementation.

1. Planned: the policies and measures are planned but their implementation has not yet started.
2. Adopted: the policies and measures are being implemented.
3. Implemented: the policies and measures have been completely implemented.
4. Long-term plan: policies and measures are included in documents other than the NDC, which can include mitigation actions proposed under the LTS. The LTS include medium-to-longer-term climate adaptation and mitigation actions that are proposed to enhance productivity and climate resilience while reducing the country's GHG emissions. This can also include innovative mitigation actions from evolving research and national circumstances.

For each relevant indicator associated with the implementation of mitigation actions, the corresponding potential GHG emissions reduction should be calculated as recommended by the MPGs, chapter III section D paragraph 85. Such potential reduction should be calculated outside the NDC Tracking Tool (using other sector specific GHG accounting tools) and then results reported back into it. The user must ensure consistency in methodology between the tools used for assessing the GHG emissions reduction from the mitigation actions and the NDC.

One such GHG accounting tool is the National Determined Contributions Expert Tool (NEXT)⁴ designed to assess the greenhouse gases impacts of different types of policies and measures in the AFOLU sector as put forward by countries in their climate commitments (NDC, LTS, NAMA, etc.), using the IPCC methodologies as recommended by the MPGs (Schiettecatte *et al.*, 2022). The total GHG emissions reduction per P&M is calculated as a sum of all emissions reduction from its corresponding indicators multiplied by their actual implementation progress (as described in section 2.1.).

2.2.2 PROJECTED IMPACT OF IMPLEMENTED POLICIES AND MEASURES

The projected impact of policies and measures, also referred to as “with measures scenario”, represents future emission trajectories deriving from the aggregated impact of the (i) adopted and (ii) implemented P&Ms. The projected impact of adopted and implemented P&Ms is calculated as the deviation from the business as usual (BAU) along the period of implementation (equations 3, 4 and 5 below) based on the financial conditions of implementation.

Equation 3.

With unconditional measures = net baseline emissions - net emissions reductions from unconditional P&Ms adopted and implemented

⁴ More information about the NEXT Tool: <https://www.fao.org/climate-change/our-work/what-we-do/ndcs/research-tools/next/en/>

Equation 4.

With conditional measures = net baseline emissions - net emissions reductions from conditional P&Ms adopted and implemented

Equation 5.

With total measures = net baseline emissions - conditional P&Ms - unconditional P&Ms

The NDC Tracking Tool also allows to include - in the projection of impacts - additional mitigation measures that are planned but not yet implemented, such as the country's long-term low-emissions development strategies (LTS) or other innovative actions from evolving research considering national circumstances (equation 6).

Equation 6.

With additional measures = net baseline emissions - all planned P&Ms - emissions reduction resulting from long term strategies or actions outside the NDC

2.2.3 EXPECTED EMISSIONS REDUCTION TARGET FROM POLICIES AND MEASURES

The expected emissions reduction target from P&Ms refers to the total net emissions resulting from all NDC planned, adopted and implemented policies and measures by the end year of the NDC, assuming the 100 percent level of implementation performance.

2.2.4 +PROGRESS ON POLICIES AND MEASURES

Progress in achieving P&Ms-related GHG reductions can be calculated comparing the GHG emissions reduction achieved from adopted and implemented P&Ms against the expected P&Ms emission reduction targets during the NDC implementation period (equation 7):

Equation 7.

$$\text{Progress on P\&Ms in \%} = \frac{\text{Emission reduction achieved from the adoption/implementation of P\&Ms}}{\text{Expected emission reduction target from P\&Ms by the end year of the NDC}} \times 100$$

⁵ Planned P&Ms stands for total planned measures (conditional and unconditional).

2.3 Inventory-based tracking

The inventory-based tracking approach refers to chapter III section C of the MPGs. This approach is straightforward, but it requires that countries possess a complete national GHG inventory data for all sectors and categories covered by the NDC. Should that be the case, progress on achieving the NDC is based on comparing the latest available information in the national GHG inventory report (NIR), noting that the GHG inventory year is two years behind the reporting year (three years if a developing country uses flexibility), with the baseline or base year emissions and removals covered by the NDC. This approach follows the below steps.

2.3.1 ACHIEVED EMISSIONS REDUCTION

The achieved emissions reduction is calculated as the difference between the reference emissions level such as base year, baseline or business as usual (BAU) and the most recent emissions and removals covered by the NDC. The scope and methodology between the NDC and inventory must be consistent. The achieved emissions reduction can be calculated based on an absolute emissions reduction target (e.g: the country is committed to reducing its net emissions by 30 percent by 2030) or intensity emissions reduction target (e.g: the country presents the per capita baseline and mitigation pathways showing a 40 percent reduction in per capita GHG emissions below BAU by 2030). In both cases, the achieved emissions reduction is calculated as shown in the equation 8

Equation 8.

$$\textit{Achieved emissions reduction} = \textit{baseline emissions} - \textit{emissions at the reporting year}$$

2.3.2 PROGRESS ON ACHIEVING NDC GOAL

Progress on achieving the NDC goal is calculated dividing the achieved emissions reduction by the NDC emissions reduction target:

Equation 9.

$$\textit{Achieved progress (\%)} = \frac{\textit{Achieved emissions reduction}}{\textit{NDC absolute or intensity emissions reduction target}} \times 100$$

2.3.3 GAP ON ACHIEVING NDC GOAL

The gap on achieving NDC goal can be calculated simply as the difference between the target and the achieved progress. If the achieved progress is higher or equal to the target value, the tool provides a 100 percent value, suggesting full implementation has been achieved.



3. How to use the Tool

Module 1: Home

The homepage of the NDC Tracking Tool (Figure 1) allows the user to select the country and collect preliminary information about the NDC against which progress will be tracked as well as its methodology.

Figure 1. Home module of the NDC Tracking Tool

Select country

NDC Submission date (year)

Today's year

Start of NDC implementation (year)

End of NDC implementation (year)

Last GHG inventory estimates (year)

i IPCC Methodology

i Please specify other methodology used

i Expected date for IPCC 2006 Transition (yyyy)

i GWP

Cambodia

2020
2024
2020
2030
2016
2006 IPCC
NA
NA
AR4

Click on the drop-down lists to select data

Click on the blue boxes to read the definitions in the glossary

Source: Authors' own elaboration.

Module 2: NDC description

The NDC description module allows the user to collect information about the NDC to be tracked according to the MPGs chapter III section B. The tool provides templates to enter the information for economy-wide NDCs based on the covered sectors as listed under the paragraph 81 of MPGs and the annex II of 5/CMA.3:⁶ energy, transport, Industrial Processes and Product Use (IPPU), agriculture, land use, land-use change and forestry (LULUCF), Waste management and others. The tool provides additional options for sectoral selection, such as agriculture, forestry and other land use (AFOLU), to accommodate the wide range of NDCs submitted by countries. According to the MPGs, paragraph 64, a description of the NDC target and its type should also be provided in the BTR. A mitigation contribution may take the form of either a GHG target, or a non-GHG target, which can also be represented by a set of actions (“Action-only”). The NDC may include P&Ms as a means of reaching the economy-wide GHG target or P&Ms non-GHG target provided in lieu of or as additional commitment to the economy-wide GHG target (non-counted in the GHG target) (FAO, 2020).

In the example in Figure 2, the NDC provides a GHG target as well as P&Ms as means to reach the GHG target (P&Ms: “included in”). The reference level may be “static”, such as an emission level in a given “base year” or in a BAU scenario, or “dynamic”, such as an emission “trajectory” (FAO, 2020).

Therefore, the tool offers four options to define the NDC reference type:

1. Base year: Target is expressed as a net emission reduction below the historical level in a specified base year.
2. Business-as-usual: Target refers to reducing net emission below the BAU scenario. It is also commonly called a Baseline scenario target.
3. Trajectory: Target specifies the year - or time frame - in which net emission is projected to peak (also called: peak target). Further, it may be expressed as a future maximum absolute limit on net emission (for example, carbon neutrality by a future date).
4. Average historical period: Target is expressed as a net emission reduction below the average level of a specified historical period. In case of NDC with GHG target, the tool allows users to collect information about the conditional and unconditional emission reduction targets expressed as a percent reduction in 2025 or 2030 (as set in the NDC) and sum the two to calculate the total target, if not already provided in the NDC.

⁶ Decision 5/CMA.3 Guidance operationalizing the modalities, procedures and guidelines for the enhanced transparency framework referred to in Article 13 of the Paris Agreement.

Figure 2. NDC Tracking Tool description for economy-wide

NDC DESCRIPTION

ECONOMY-WIDE

- i Target type
- i Policies and Measures included in or separate from GHG target
- i Reference type
- i Base year or historical (if applicable)
- i Unconditional contribution (%)
- i Conditional contribution (%)
- i Total target (%)
- i Sectors covered →
- i Gases covered

	Please select
	Included in
	Business-as-usual
	NA
	30
	12
	42
	Agriculture, LULUCF, Energy, Transport
	N2O, CH4, CO2

Click on the arrow to see a full list of IPCC 2006 sectors and gases to be reported

The drop-down list offers multiple selection for all sectors and gases covered by the NDC

Instructions on using the tool

Use the drop-down list to describe the NDC

Source: Authors' own elaboration.

The tool allows to enter information to track progress for the agriculture forestry and other land use disaggregated by subsectors: agriculture and LULUCF according to the common reporting tables of the NIRs (dec. 5/CMA.3.annex 2). However, the tool also offers the option to enter this information for the AFOLU sector as a whole to facilitate countries which lack detailed information at sub-sectorial level (Figure 4). In this case, the IPCC 2006 categories for the agriculture and LULUCF should be considered as follow: agriculture sub-categories include livestock (3A), and Aggregate Sources and Non-CO₂ Emissions Sources (3C), while the land use, land use change and forestry include the land subcategories (3B) and others (3D) (Figure 3).

Figure 3. NDC Tracking Tool description for the Agriculture and the LULUCF subsectors

NDC DESCRIPTION

AGRICULTURE

Target type		GHG target
P&Ms included in or separate from GHG target		Included in
Reference type		Business-as-usual
Base year or historical (if applicable)		NE
Unconditional contribution (%)		NE
Conditional contribution (%)		NE
Total target (%)		4,00
Sectors covered →	<p>Click on the arrow for the full description of category codes and select all the categories and gases covered by the NDC</p>	3A, 3C
Gases covered →		CH4, CO2, N2O

LAND USE, LAND USE CHANGE AND FORESTRY (LULUCF)

Target type		GHG target
P&Ms included in or separate from GHG target		Included in
Reference type		Business-as-usual
Base year or historical (if applicable)		NE
Unconditional contribution (%)		NE
Conditional contribution (%)		NE
Total target (%)		24,82
Sectors covered →	<p>Use the appropriate notation key if the data is not available. Click on the blue box for more guidance</p>	ALL
Gases covered		CO2, N2O

Source: Authors' own elaboration.

Figure 4. NDC Tracking Tool description for the AFOLU sector

NDC DESCRIPTION

AGRICULTURE, FORESTRY AND OTHER LAND USE (AFOLU)

Target type		GHG target
Policies and Measures included in or separate from GHG target		Included
Reference type		Business-as-usual
Base year or historical (if applicable)		NE
Unconditional contribution (%)		NE
Conditional contribution (%)		NE
Total target (%)		4,03
Sectors covered →		ALL
Gases covered		CH4, CO2, N2O

Source: Authors' own elaboration.

Module 3: Policies and measures

The P&Ms module describes national, sub-national and regional mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving an NDC according to the MPGs chapter III section D. The module also allows the tracking of adaptation actions according to the MPGs section IV.

The completion of this module requires performing a policy literature review in advance, using a bottom-up approach starting from the information provided in the country's NDC. This could be supported by a national stakeholder consultation to understand the integration of the national and sub-national policies in the NDC and how the NDC influences the national policy process.

The choice of policies and measures to be included in the analysis should prioritize those that have the most significant impact on GHG emissions or removals and those impacting key categories in the national GHG inventory according to the MPGs chapter III section D paragraph 80. Figure 5 and Figure 6 provide an example of detailed information on a policy supporting the implementation of an NDC. The user can enter the policy and measure two times, if needed, in order to account for the conditional and unconditional part of the measure.

Figure 5. Description of Policy and measures (1)

POLICIES AND MEASURES (P&Ms)							
Conditionality	Policy & Measures	Information on what the conditionality depend upon	Type of contribution	Sector	Included in or separate from the GHG target	Description	Objectives
Conditional	Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)	International assistance	Adaptation	Agriculture	Included in	National Action Program to combat land degradation 2018-2027	
Conditional	Organic input agriculture and bio-slurry; and deep placement fertilizer technology	Depending on EU accession process and the market mechanism conditions	Mitigation	Agriculture	Included in	National Action Program to combat land degradation 2018-2027	
Conditional	Efficiency energy and pollution management in latex and rubber wood processing	Depends on regional partnership and agreements on forestry management	Mitigation	Agriculture			2019-
Conditional	Promote fodder production to improve high nutrient rich and high-quality forage feed value agriculture by-products technology to support cattle production		Mitigation	Agriculture			2016-
Conditional	Promote manure Management through compost making process to reduce carbon emission		Mitigation	Agriculture			2016-
	Bio-digesters construction (85% reduction compared to						2019-
						2023; Strategic Planning	

Callout 1: Please select the conditionality of the action

Callout 2: Please note the drop-down list for sectors changes upon specifying the type of contribution

Callout 3: All white cells are mandatory, while grey cells are optional cells

Source: Authors' own elaboration.

Figure 6. Description of Policy and Measures (2)

Assign the implementation status to each P&M

Click on the blue box for the definitions

POLICY AND MEASURES (P&Ms)						
Conditionality	Policy & Measures	Type of instrument	Implementation status	Other sectors affected	gases affected	P&M Co-benefits
Unconditional	Scale up renewable energy penetration by 10% by 2030	Please select	Planned	Energy	Please select	
Conditional	City-wide resilient infrastructure planning.	Please select	Planned	Please select	Please select	
Unconditional	Integrated water resources management.	Please select	Adopted	Please select	Please select	
Conditional	Enhance climate services for efficient weather information ma	Please select	Adopted	Please select	Please select	
Unconditional	Early warning and disaster risk management.	Please select	Adopted	Please select	Please select	
Conditional	Build resilience and promote livelihood opportunities for the yo	Please select	Adopted	Please select	Please select	
Unconditional	Enhance climate resilience of women and the vulnerable.	Please select	Adopted	Please select	Please select	
Conditional	Promote gender-responsive sustainable forest management	Please select	Planned	Energy, Waste	Please select	
Unconditional	Promote gender-responsive sustainable forest management	Please select	Adopted	Please select	Please select	

Source: Authors' own elaboration.

Module 4: Indicators

This module allows the user to provide more detailed information on all indicators selected to track an NDC according to the MPGs, paragraph 66. Please refer to section II of this guide for different type of indicators and examples. The indicators refer to either non-GHG indicators provided in the NDC, or indicators related to the implementation of P&Ms (as identified in the previous module). P&Ms can include multiple indicators, in which case it is recommended to create a separate line for each indicator and assess their implementation progress separately (Figure 7 and Figure 8).

For GHG targets, the indicators module provides four additional sections in which the estimated net GHG emissions reduction resulting from the implementation of the indicator can be entered by gas: CO₂, CH₄, N₂O and all fluorocarbons (FCs) including (HFCs, PFCs, SF₆, NF₃) in tonnes of CO₂ equivalent (Figure 9). A fourth section provides the total emissions reduction per indicator calculated automatically as the sum of the three gases. It is important to note this module's input (GHG net emissions reduction for each year of the implementation phase) must be estimated separately using a greenhouse gas accounting based on the methodologies and accounting approach consistent with the IPCC (for example the NDC Expert Tool - NEXT) (Schiettecatte *et al.*, 2022).

Figure 7. The indicators module of the tool to allow their tracking (1)

INDICATOR TRACKING		i	i		
Policies & Measures (P&Ms)	Indicator	Indicator measure	Reference type	Unit	Start year
C - Scale-up renewable energy penetration by 10% by 2030.	Increase small-medium hydro installed capacity up to 150-300MW	Quantitative	Action only	MW	
C - Scale-up renewable energy penetration by 10% by 2030.	Attain utility scale wind power capacity up to 50-150MW	Quantitative	Action only	MW	
U - Promote gender-responsive sustainable forest management	45% emission reduction through resultbased emission reduction programme in cocoa landscape.	Quantitative	Base year	% ghg emissions	
C - Promote gender-responsive sustainable forest management	Wildfire management in the transition and savannah	Qualitative	Business-as-usual	NA	
C - Promote gender-responsive sustainable forest management	Annual reforestation/afforestation of 20,000ha on annual	Qualitative	Business-as-usual	ha	
U - Integrated water resources management.	Equitable distribution and access to water	Qualitative	Please Select	% off the population	
U - Manage climate-induced and gender-related health risks.	Strengthen climate related disease surveillance in vulnerable communities in 3 Districts.	Qualitative	Action only	Number of districts	
U - Resilience for gender and the vulnerable	Implementation of community led adaptation and livelihood diversification for vulnerable groups	Qualitative	Action only	NA	

Note: Callouts in the original image indicate: 'If a P&Ms has more than one indicator, create a line for each indicator, and select the corresponding P&Ms twice'; 'Allows the combination of quantitative and qualitative indicators'; 'Enter the unit based on which progress is measured'; and 'Select the conditional and unconditional part of the P&M'.

Source: Authors' own elaboration.

Figure 8. The indicators module of the tool to allow their tracking (2)

Unit	(yyyy)	End/target year (yyyy)	Reference year (yyyy)	Reference level	Target level	Comment on implementation progress	Expected progress	Implementation progress
MW	2020	2030	2020	50	225			
number of people trained	2021	2030	2020	30	100		44%	90%
ha	2021	2030	2020	500	5 130		44%	80%

Note: Callouts in the original image indicate: 'Click on the blue box for the definitions' (pointing to the 'i' icon); 'To be estimated by the implementation entity based on consideration of actual implementation progress.' (pointing to the progress bars); and 'An automatic estimate of cumulative progress to date, expressed as the rate of implementation, calculated based on the period of implementation and current date' (pointing to the percentage values).

Source: Authors' own elaboration.

Figure 9. Estimation of emission reduction corresponding to policies and measures

Click on the appropriate gas to enter corresponding emissions reduction

INDICATOR TRACKING		Please click on each box to enter actual removal calculated by GHG accounting tools (keeping the same methodology as the NDC)									
		Total emission reduction in tonnes of CO ₂ equivalent									
		<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> GHG Accounting tool Information about the other tools used 2010 2011 2012 2013 2014 2015 2016 2017 2018 </div>									
Policies & Measures (P&Ms)	Indicator	<div style="display: flex; justify-content: space-between; font-size: 0.8em;"> CO₂ CH₄ N₂O FCs </div>									
C - Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)	Battambang ; Preah Vihea and Kampong Cham Provinces	NEXT									
C - Organic input agriculture and bio-slurry; and deep placement fertilizer technology	10 provinces	NEXT									
C - Efficiency energy and pollution management in latex and rubber wood processing	demonstration local factory for latex and rubber timber processing (energy saving, pollution free, less chemical input, and improve quantity and quality of raw products)	Please select									
C - Promote fodder production to improve high nutrient rich and high-quality forage feed value agriculture by-products technology to support cattle production	1year/1ha/province	Please select									
C - Promote manure Management through compost making process to reduce carbon emission	25 provinces and cities	Please select									
C - Bio-digesters construction (85% reduction compared to 2000) (Small size (2-3-4m ³); Medium size(6-8-10m ³), Large size(>10m ³))	1,500 bio-digester plant per year (include: small=1450; medium= 45; large=5)	Please select									

Please provide information about the tool used to estimate emission reduction from P&Ms

Source: Authors' own elaboration.

Module 5: Greenhouse gas tracking

The GHG tracking module provides the opportunity to enter (i) the GHG inventory and (ii) the baseline projections for all emissions covered by the NDC. This information is the basis for tracking the progress achieved. The baseline projections can be retrieved from the NDC. In the inventory section, the user is required to enter GHG emissions for all years of the time series as presented in the most recent GHG inventory submitted to the United Nations Framework Convention on Climate Change (UNFCCC) per sectors and categories covered by the NDC (Figure 10). Until the first BTR is available, this information shall be retrieved from national GHG inventories, national communications, or biennial update reports.

The third section (Figure 11) consists in calculating the GHG target based on the percent (provided in the module NDC description). The percentage reduction for each year is calculated as a cumulative progress based on the start and the end of the implementation period assuming linear progress. For example, if the target at the end year is 50 percent emissions reduction over a period of 10 years from 2020 to 2030, the percentage progress for each year is expected to be $50 / (2030 - 2020) = 5$ percent. To calculate the GHG target, if the NDC reference type is a BAU, the conditional emission reduction target for each year is calculated as follows:

Equation 10.

$$\text{Conditional emission reduction target} = \text{Baseline} - (\text{Baseline} \times \text{conditional reduction percentage} / 100)$$

If the NDC reference type is a reference year, the conditional emission reduction target is calculated for each year as follow:

Equation 11.

$$\text{Conditional emission reduction target} = \text{Emissions at base year} - (\text{emissions at base year} \times \text{conditional reduction percentage} / 100)$$

Figure 10. Inventory and baseline data for tracking GHG emissions and removals covered by the NDC

NDC TRACKING of GHG EMISSIONS							
Greenhouse gas Inventory covered by the NDC		2019	2020	2021	2022	2023	2024
Total emissions and removals			27 397,70		31 275,36		
1	Energy		13 060,00		17 560,80		
2	Industrial Processes and Product Use (IPPU)		3 146,00		2 831,40		
3	Agriculture, Forestry and Other Land Use (AFOLU)				0 000,00		
	Agriculture		9 110,70		8 913,06		
	LULUCF				0 000,00		
4	Waste management		2 081,00		1 970,10		
5	Other						
Baseline		2019	2020	2021	2022	2023	2024
0 Total emissions and removals			27 397,70		28 560,00		
1	Energy		13 060,00		19 512,00		
2	Industrial Processes and Product Use (IPPU)		3 146,00		3 146,00		
3	Agriculture, Forestry and Other Land Use (AFOLU)				0 000,00		
	Agriculture		9 110,70		9 903,40		
	LULUCF				0 000,00		
4	Waste management		2 081,00		2 189,00		
5	Other						

Source: Authors' own elaboration.

Figure 11. Calculation of the target for each year of the implementation period

NDC TRACKING OF GHG EMISSIONS											
Greenhouse gas Inventory covered by the NDC		2019	2020	2021	2022	2023	2024	2025	2026	2027	
GHG Target		2019	2020	2021	2022	2023	2024	2025	2026	2027	
Unconditional GHG emissions reduction		2019	2020	2021	2022	2023	2024	2025	2026	2027	
Total emissions reduction			25 479,86					32 317,87			
1	Energy		11 754,00					17 560,80			
	Transport										
2	Industrial Processes and Product Use (IPPU)		3 146,00					3 146,00			
3	Agriculture, Forestry and Other Land Use (AFOLU)										
	Agriculture		8 895,69					9 669,68			
	LULUCF										
4	Waste management		2 081,00					2 189,00			
5	Other										
Conditional GHG emissions reduction		2019	2020	2021	2022	2023	2024	2025	2026	2027	
Total emissions reduction			21 370,21					27 105,31			
1	Energy		8 985,28					13 424,26			
	Transport										
2	Industrial Processes and Product Use (IPPU)		3 146,00					3 146,00			
3	Agriculture, Forestry and Other Land Use (AFOLU)										
	Agriculture		8 234,25					8 950,69			
	LULUCF										
4	Waste management		2 081,00					2 189,00			
5	Other										
Total target GHG emissions reduction		2019	2020	2021	2022	2023	2024	2025	2026	2027	
Total emissions reduction			19 452,37					24 672,78			
1	Energy		7 679,28					11 473,06			
	Transport										
2	Industrial Processes and Product Use (IPPU)		2 891,17					2 891,17			
3	Agriculture, Forestry and Other Land Use (AFOLU)										
	Agriculture							8 716,97			
	LULUCF										
4	Waste management							2 189,00			
5	Other										

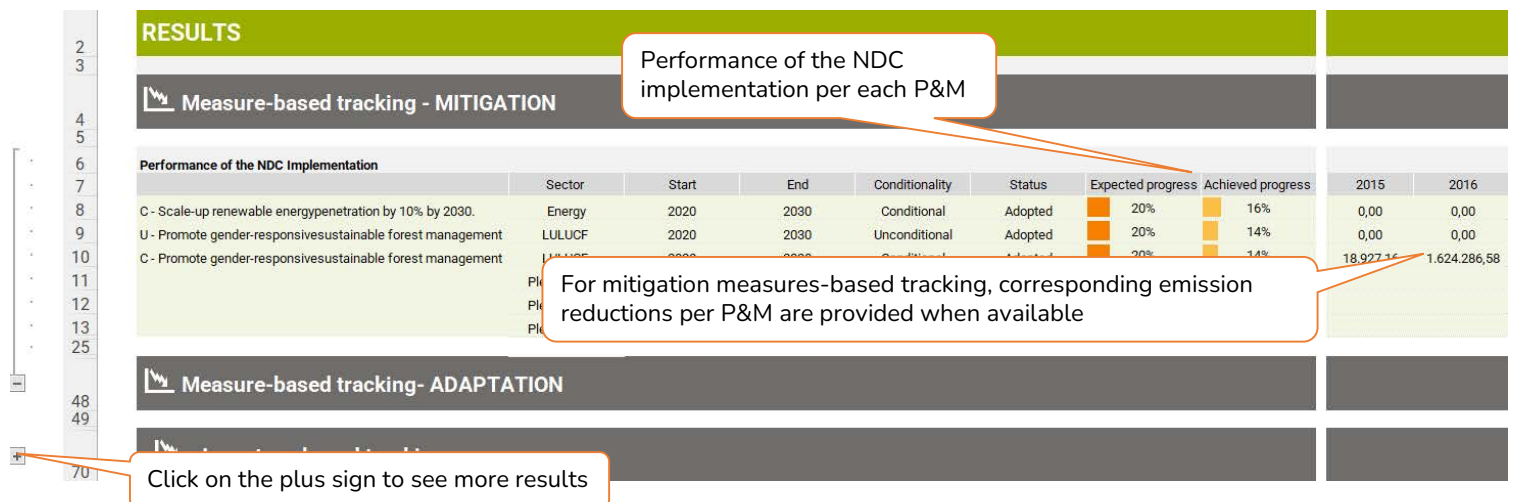
Source: Authors' own elaboration.

Module 6: Results

This section provides detailed results of the NDC implementation performance and/or the overall assessment of the NDC achievement based on the type of data entered in previous sections. The results are presented in three sections: (i) the mitigation policies and measures tracking (Figure 12), (ii) adaptation policies and measures and (iii) inventory-based tracking of GHG emissions achieved. The dashboard template (Figure 13 and Figure 14) shows the following categories of achievable results:

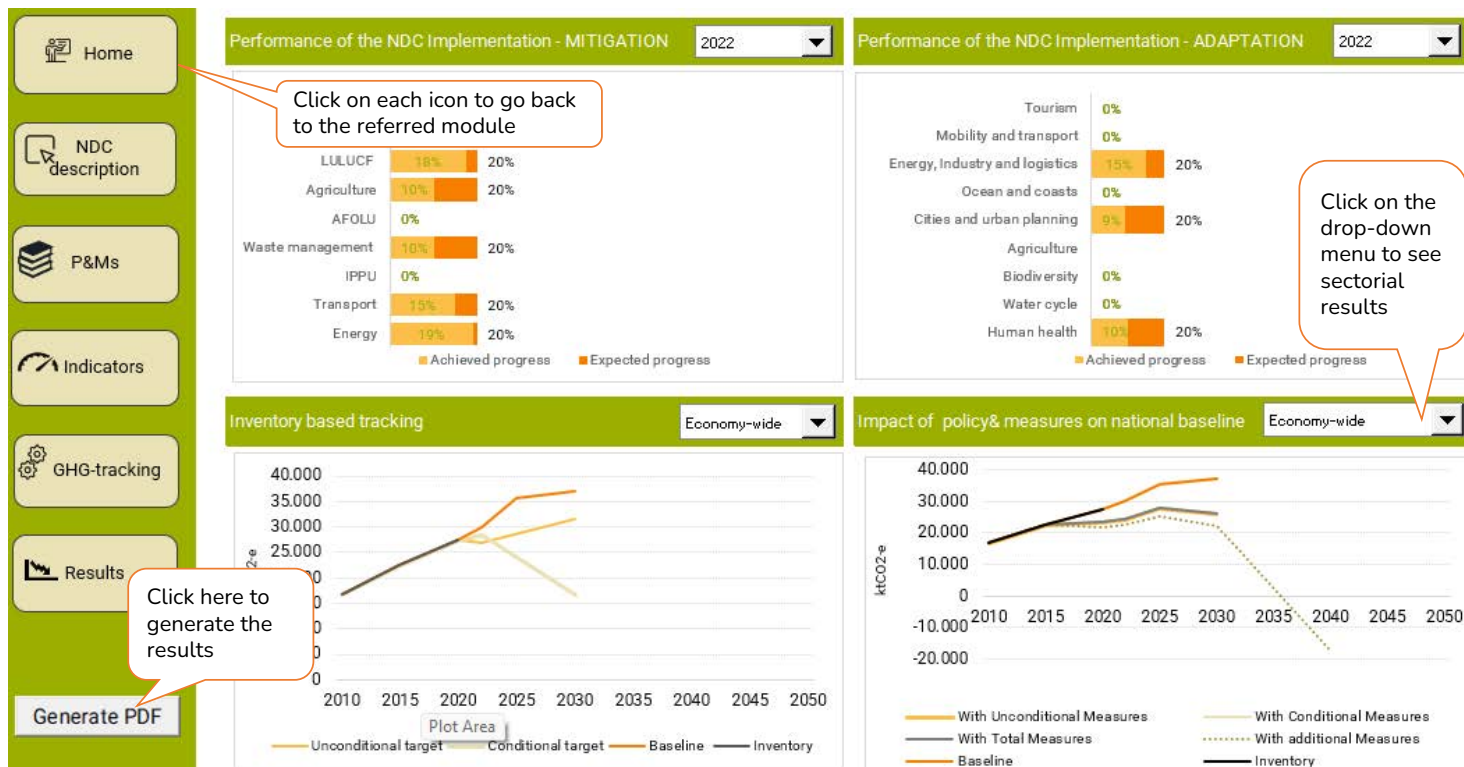
1. The performance of the NDC implementation for both mitigation and adaptation actions per sector. This result is based on an assessment provided by the implementation entity based on consideration of actual implementation progress.
2. The overall status of the NDC implementation on the economy-wide scale is provided, allowing the user to assess the overall rate of implementation progress by comparing the mitigation and adaptation actions implemented versus the actions planned.
3. GHG emissions reduction achieved based on inventory data in the reporting year compared to the NDC target.
4. An assessment of the greenhouse gas impacts of implemented key policies and actions compared to a baseline scenario.
5. A share of total emission reductions achieved for a given reporting year out of the emission reductions target in the NDCs (Figure 14), allowing to identify existing gaps in NDC implementation.

Figure 12. Detailed results of the NDC Tracking Tool



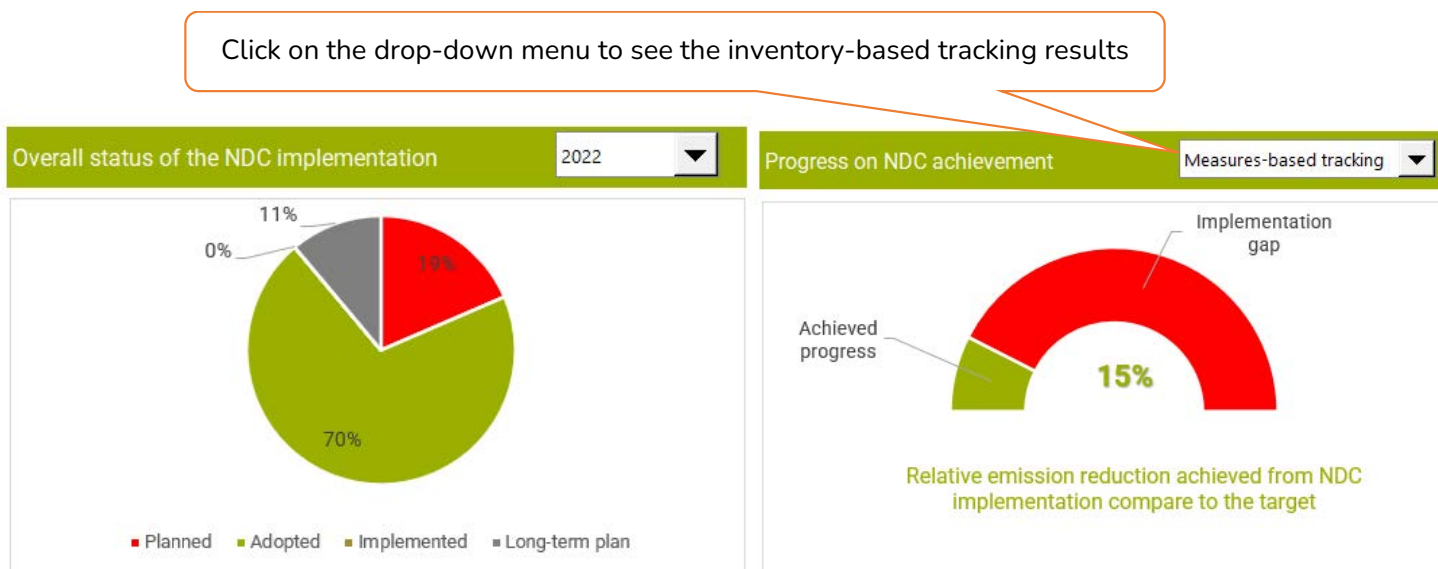
Source: Authors' own elaboration.

Figure 13. Dashboard of the NDC Tracking Tool



Source: Authors' own elaboration.

Figure 14. (1) Dashboard - Overall status of the NDC implementation (2) Progress on NDC achievement



Source: Authors' own elaboration.

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Glossary

1. IPCC methodology: According to the Modalities, Procedures and Guidelines (MPGs), Parties shall use the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, and any subsequent version or refinement of the IPCC guidelines. Parties are encouraged to use the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands.
2. Other methodology used: According to the decision 4/CMA.1 annex II, paragraph 1(b) Parties whose NDCs cannot be accounted for using methodologies covered by IPCC guidelines but can provide information on their own methodology used.
3. Expected date for IPCC 2006 transition: The year in which the country is expecting to transition to using the IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Decision 18/CMA.1 paragraph 20.).
4. GWP: Global Warming Potentials (GWP) are calculated as the ratio of the radiative forcing of one kilogramme greenhouse gas emitted to the atmosphere to that from one kilogramme CO₂ over a period of time (for example 100 years). Parties shall use values listed in table 8.A.1 of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (MPGs paragraph 37).
5. Target type: (i) non-GHG target: Mitigation contribution expressed as a set of actions (action-only). Each action may be associated with a quantified or non-quantified outcome; for example, 200 hectares of land restored by 2030 or participatory environmental management of resources and land use. (ii) GHG target: A GHG emission reduction commitment expressed as a percent reduction in net emissions (target level) compared against a reference level.
6. Policies and Measures included in or separate from GHG target: (i) Policies and Measures included in GHG target: sectoral mitigation policies or measures (P&Ms) proposed as means of reaching the general GHG target, (ii) P&Ms separate from GHG target: sectoral mitigation policies or measures without an associated GHG target that are proposed as an additional commitment to the general GHG target.
7. Reference type: (i) Base year: an historical GHG emission level against which the GHG target is set; (ii) Business-as-usual: Refers to a BAU scenario against which the GHG target is set (also called a Baseline scenario target); (iii) Trajectory: the year or time frame in which net emissions are projected to peak and against which the GHG target is set (also called peak target). Further, it may be expressed as a future maximum absolute net emissions scenario against which the GHG target is set (for example, carbon neutrality by a future date); (iv) Average historical period: an average level of emissions over a specific historical period against which the GHG target is set.
8. Base year: year against which the GHG target is set, if applicable.
9. Unconditional contribution: GHG emission reduction target to be reached through use of national resources, expressed as a percent reduction by 2025 and/or 2030.

10. Conditional contribution: GHG emission reduction target to be reached subject to receiving international support, expressed as an additional percent reduction by 2025 and/or 2030.
11. Total target: the sum of unconditional and conditional GHG emission reduction expressed as a percent in 2025 and/or 2030.
12. Sectors covered: any sector covered by the NDC target. Please click the arrow to refer to the IPCC 2006 summary of the Annex 8A.2 reporting tables for more information on sectors, categories codes and gases.
13. Gases coverage: gases covered by the NDC target. Carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).
14. Type of contribution: Please select "mitigation" to account for adaptation actions with mitigation co-benefits, and create a separate line to account for the "adaptation part" of the action if applicable
15. Included in or separate from the GHG target: (i) P&Ms included in GHG target: sectoral mitigation policies or measures without an associated GHG target that are proposed as a means of reaching the general GHG target. (ii) P&Ms separate from GHG target: sectoral mitigation policies or measures without an associated GHG target that are proposed as an additional commitment to the general GHG target.
16. Implementation status: current status of implementation of the proposed policy and measure (i) adopted: on-going implementation of policies and measures (ii) implemented: implemented policies and measures (iii) planned: policies and measures that are planned but implementation has not yet started (iv) Long term-plan: policies and measures that are proposed within the country's LTS.
17. Part of international transfer: Specify whether the country is selling emission reductions expected from implementation of the mitigation action; if the answer is yes, those emission reductions are not accounted for by the selling country but rather by the buyer country. This is needed to avoid double accounting according to the Article 6 of the PA.
18. Indicator (s): An indicator is a metric by which progress towards a target can be tracked. For example, net GHG emissions and removals, percentage reduction of GHG intensity, relevant qualitative indicators for a specific policy or measure, mitigation co-benefits of adaptation actions and/or economic diversification plans or other (for example, hectares of reforestation, percentage of renewable energy use or production, carbon neutrality, share of non-fossil fuel in primary energy consumption and non-GHG related indicators) (PMGs, paragraph 66.).
19. Indicator measure: Reference on whether the target is tracked through quantitative (for example, percentage reduction of GHG intensity) only/or qualitative metrics (for example, improve the quality of pasture with leguminous plant).
20. Target type: type of counterfactual scenario (for example, baseline, business-as-usual) against which the mitigation action's quantitative target is set, if applicable.
21. Start year: start year of implementation.
22. End year: end year of implementation.
23. Target reference year: base year (or historical year) against which the mitigation action's target is set, if applicable.
24. Target Reference level: a benchmarked value against which the target is set. A reference level is associated with an indicator (for example, tCO₂e, percentage points, number of units).
25. Target level: quantitative value associated with the target, which is tracked against the reference value by means of an indicator (for example, tCO₂e, percentage, number of units, and so on).

26. Expected progress: An automatic estimate of cumulative progress to date, expressed as the rate of implementation, calculated based on the period of implementation and current date, assuming linear progression between the start and end year.
27. Implementation Actual progress: An estimate of cumulative progress to date, expressed as the rate of implementation, to be calculated by the implementation entity based on consideration of actual implementation progress.
28. Total emission reduction: According to the MPGs, Parties shall provide, to the extent possible, estimates of expected and achieved GHG emissions reductions from policies and measures. The methodologies used for GHG estimates of P&Ms must be consistent with the one of the NDC.
29. GHG inventory: National and sectorial greenhouse gas emissions and removals for the reference year as well as for the most recent year of reporting. Please click on the plus signs to enter data by category. Only sectors and categories covered by the NDC shall be considered and methodologies between the inventory and the NDC shall be consistent.
30. Baseline: Please click on the plus signs to enter data by category. Only sectors and categories covered by the NDC shall be considered and methodologies shall be consistent.
31. Conditional target: Based on the information under NDC description (reference type and conditional emission reduction in percentage), net target reduction emissions shall be calculated for each year of the implementation period (for example, if the reference type is a business-as-usual, the conditional emission reduction = $\text{Baseline} - (\text{Baseline} \times \text{percent conditional emission reduction} / 100)$).
32. Unconditional target: Based on the information under NDC description (reference type and unconditional emission reduction in percentage), net target reduction emissions shall be calculated for each year of the implementation period (for example, if the reference type is a business-as-usual, the unconditional emission reduction = $\text{Baseline} - (\text{Baseline} \times \text{percent unconditional emission reduction} / 100)$).
33. Total target: Calculated as the sum of conditional and unconditional target values for each year of the implementation period.

Annex: Installation instructions

MINIMUM REQUIREMENTS

The NDC Tracking Tool is an excel-based tool that runs in **Microsoft Excel 2016 and subsequent releases.**

Please make sure **you DO NOT run the tool from a cloud-synced folder**, such as OneDrive or DropBox, as it could encounter some technical problems. Rather, **ensure to copy/move the folder NDC Tracking Tool** (resulting from the unzipping of the file distributed) **under a main hard drive**, such as C:\.

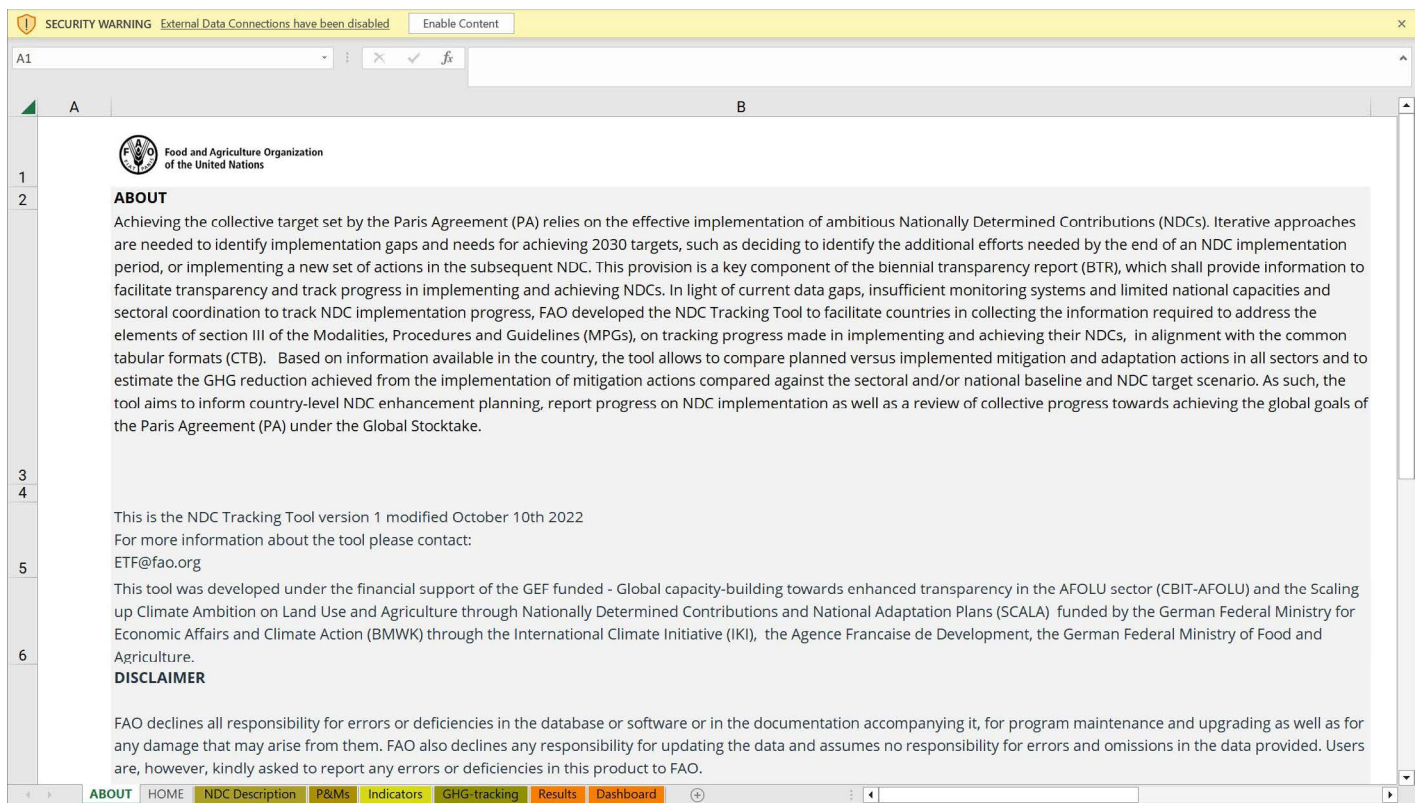
RUNNING THE TOOL

The tool contains macros (for example, code written in Visual Basic for Applications) to automate and perform certain tasks. In some computers, all macros are disabled in Excel by default to protect from malicious code. **The macros contained in this tool do not represent a risk to your computer** (Figure A.1).

Double click on the .xlsm file in the **NDC Tracking folder** to launch the tool. Should you get a security warning that “active content” (for example, macros) has been disabled, click on the **‘Enable Content’** button to enable the macros. In some cases, this is already sufficient to run the tool (the warning box at centre page disappears), **thus the remainder of this document can be disregarded.**

When the warning box remains on screen, **close the Excel file** and **open a new Excel session with a blank sheet.**

Figure A1. Excel security warning to enable macros options




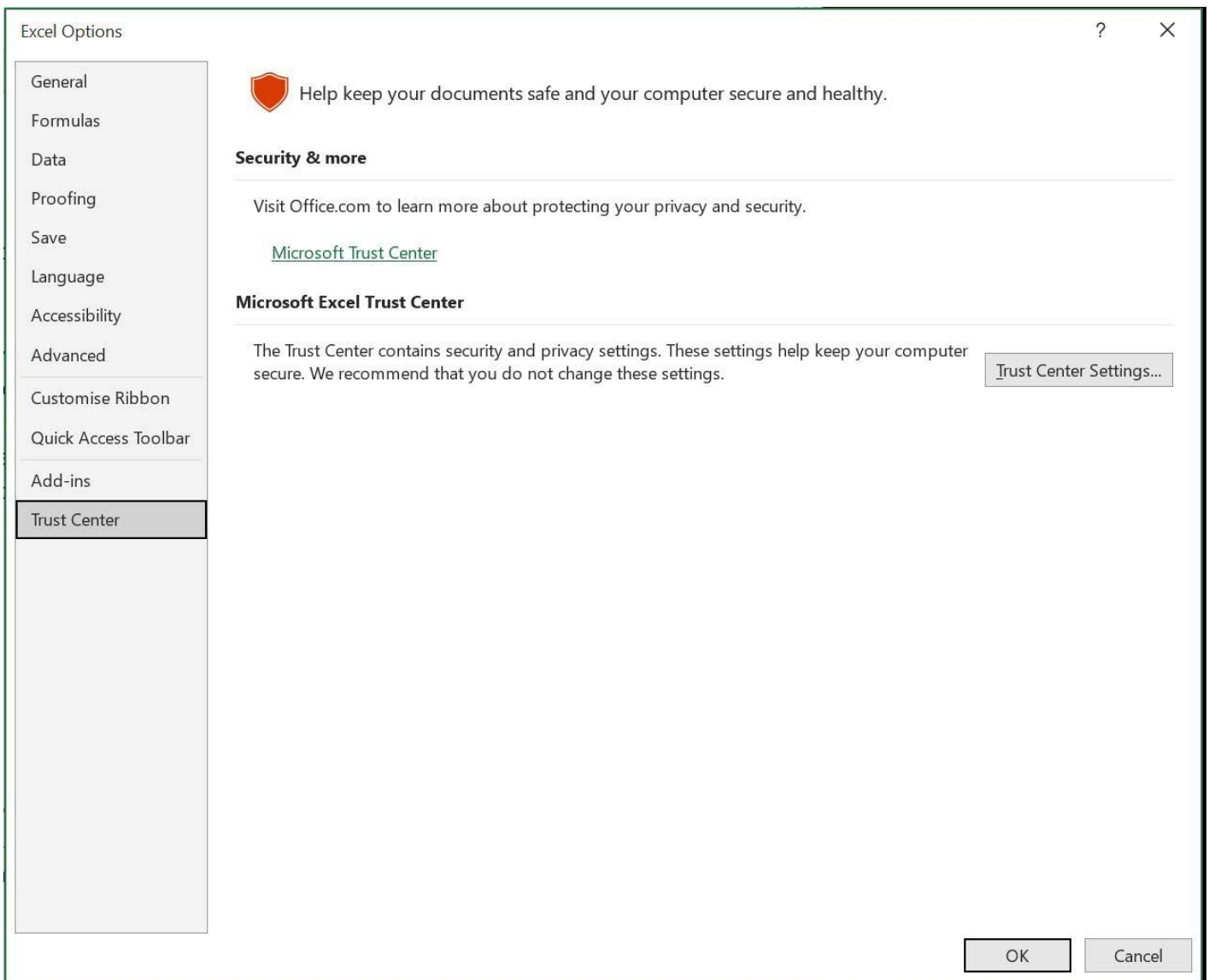
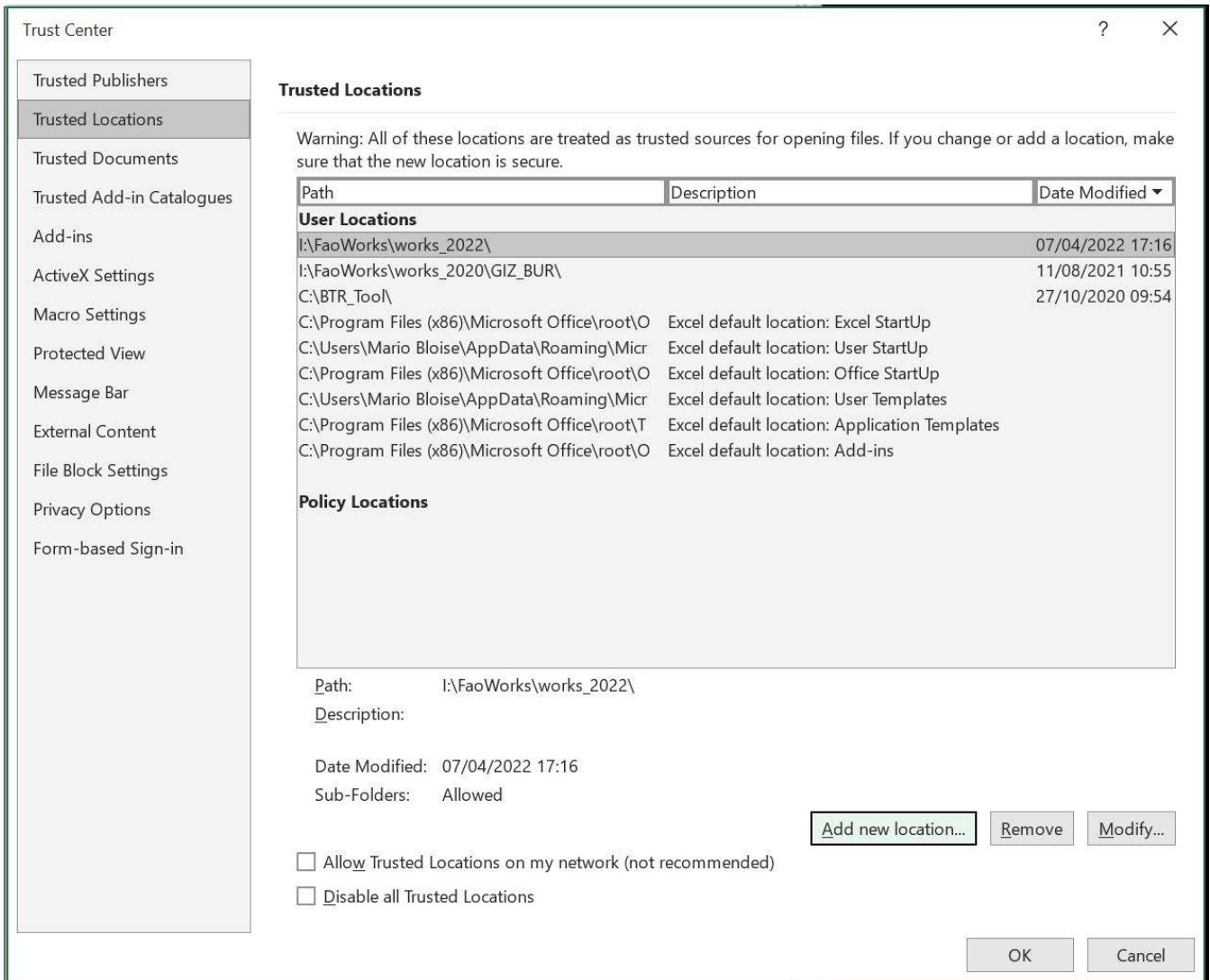
1. Select the **File** tab and then click **Options** (if you're using Excel version 2010 or later) or Microsoft Office Button  (if you're using Excel 2007). The Excel Options dialog box appears (Figure A.2).

Figure A2. Excel Options dialog box



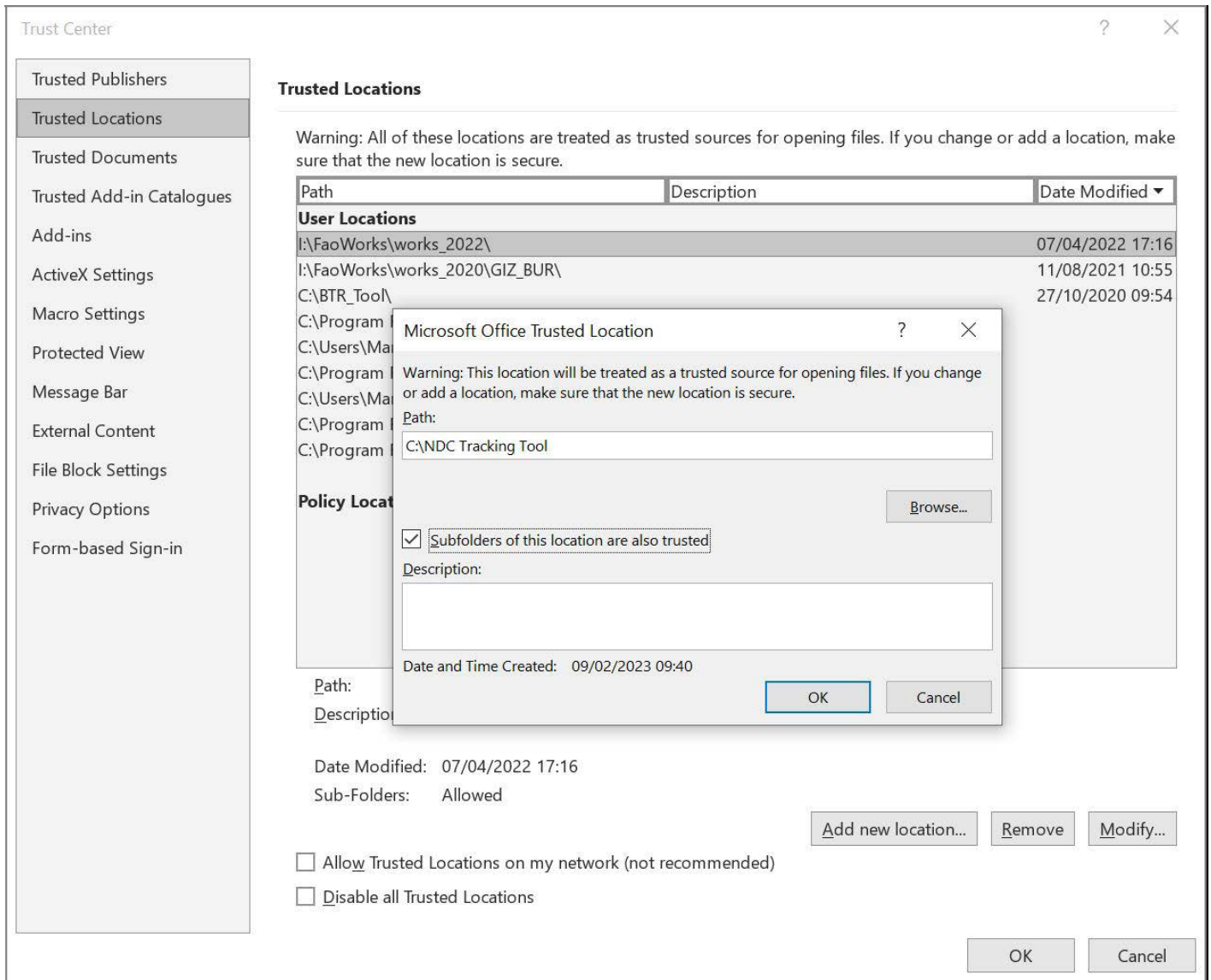
2. Select **Trust Center** in the sidebar to the left, and then click the **Trust Center Settings** button to the right.

Figure A3. Excel trust centre



3. Select **Trusted Locations** from the sidebar to the left (Figure A.3) and click on **Add new location** button to the right.

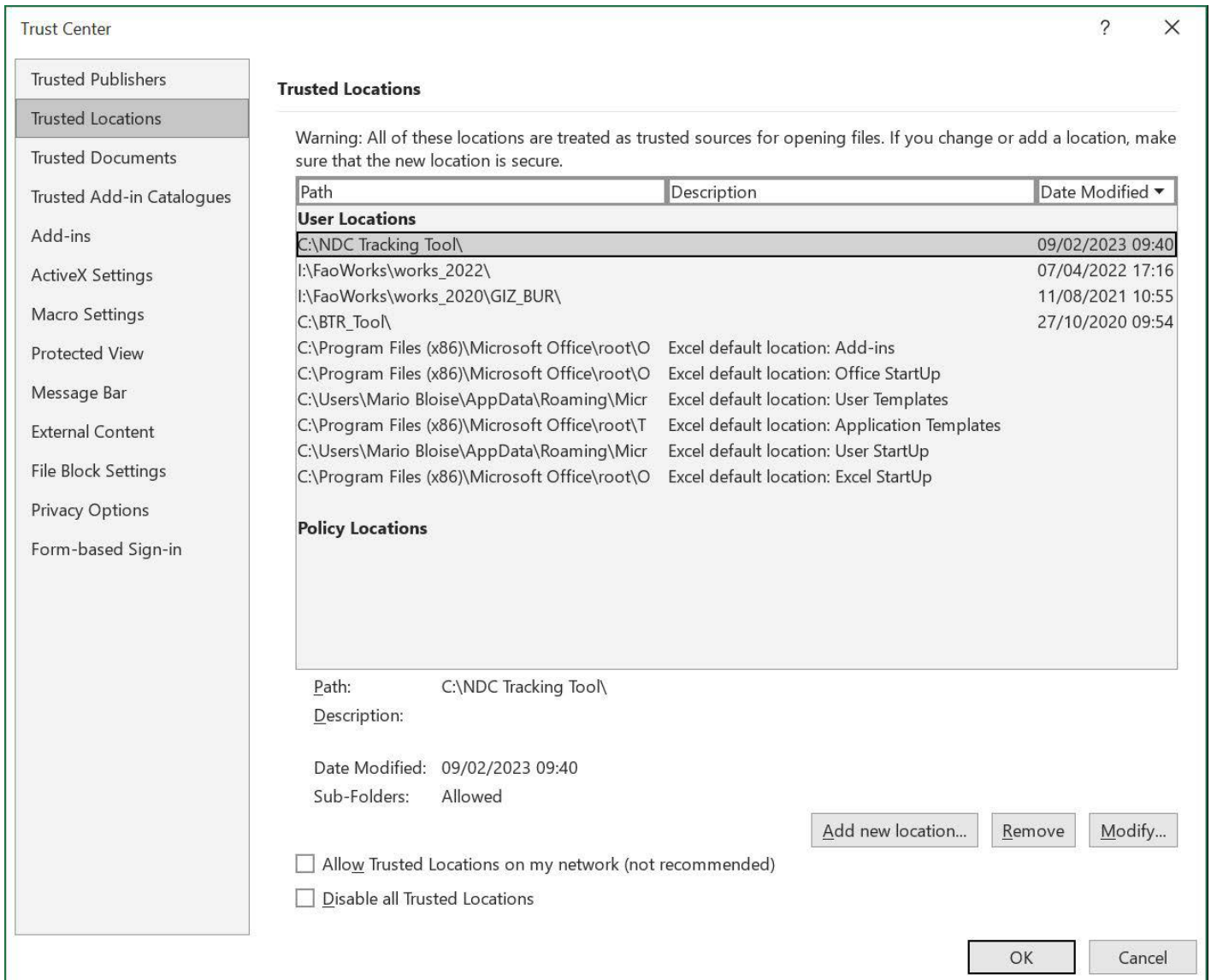
Figure A4. Excel trusted location window



4. In the trusted location windows (Figure A.4), **type in** or browse to the full path of the folder where the tool (.xism file) is located (for example, C:\NDC Tracking Tool\), then **select the “Subfolders of this location are also trusted” checkbox**.

5. Press OK to see the new location among the trusted ones (Figure A.5).

Figure A5. List of trust locations in your computer



6. Press OK.

7. To complete, press OK again and close Excel.

8. Now you are ready to launch the tool (file .xlsm) again.



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of Food
and Agriculture



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