



Strengthening Thailand's institutional and technical capacities to comply with the Enhanced Transparency Framework of the Paris Agreement

Part I: Project Information

GEF ID

10150

Project Type

MSP

Type of Trust Fund

GET

CBIT/NGI

CBIT

NGI

Project Title

Strengthening Thailand's institutional and technical capacities to comply with the Enhanced Transparency Framework of the Paris Agreement

Countries

Thailand

Agency(ies)

UNEP

Other Executing Partner(s)

Office of Natural Resources and Environmental Policy and Planning

Executing Partner Type

Government

GEF Focal Area

Climate Change

Taxonomy

Focal Areas, Climate Change, Climate Change Mitigation, Climate Change Adaptation, Mainstreaming adaptation, Influencing models, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Stakeholders, Civil Society, Academia, Private Sector, Large corporations, Type of Engagement, Consultation, Information Dissemination, Participation, Gender Equality, Gender Mainstreaming, Beneficiaries, Sex-disaggregated indicators, Gender results areas, Capacity Development, Awareness Raising, Capacity, Knowledge and Research, Learning, Indicators to measure change, Knowledge Generation, Knowledge Exchange, Enabling Activities

Rio Markers

Climate Change Mitigation

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 1

Submission Date

11/16/2020

Expected Implementation Start

4/1/2021

Expected Completion Date

3/31/2024

Duration

36In Months

Agency Fee(\$)

189,145.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCM-3-8	CBIT	GET	1,991,000.00	2,027,293.00
Total Project Cost(\$)			1,991,000.00	2,027,293.00

B. Project description summary

Project Objective

Thailand has the necessary capacities and institutional arrangements to comply with the requirements of the Enhanced Transparency Framework.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
1. Strengthening data collection processes and data quality for Greenhouse Gases (GHG) inventory preparation	Technical Assistance	1. Thailand has the institutional and human capacities to regularly prepare accurate and transparent GHG inventories of the Agriculture, Forestry and Other Land Use (AFOLU) and Energy Sector through its national GHG inventory system	<p>1.1 Institutional arrangements, including processes and procedures for data collection and reporting in the Agriculture, Forestry and other Land Use (AFOLU) sector formalized</p> <p>1.2 Sectorial guidelines, templates and tools for data collection developed and training provided to support operationalization of the web-based inventory system in the Agriculture, Forestry and other Land Use (AFOLU) sector</p> <p>1.3 Country-specific emission factors following IPCC[1] Guidelines developed in the Agriculture, Forestry and other Land Use (AFOLU) and Energy sectors</p> <p>1.4 Methodology and system for QA/QC[2] for data from the Forestry sector developed</p>	GE T	1,141,000.00	1,084,557.00
			[1] Intergovernmental Panel on Climate Change (IPCC)			
			[2] Quality Assurance/Quality Control			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
2. Strengthening tracking and reporting of Thailand's mitigation actions	Technical Assistance	2. Thailand's transparency framework for the Agriculture sector enabled to track progress in implementing its mitigation action and report regularly as per Paris Agreement	<p>2.1 Institutional arrangements for tracking of mitigation action, including quality check of GHG reduction estimations, formalized in the Agriculture sector</p> <p>2.2 Monitoring indicators and information matrix to track progress of mitigation action in the Agriculture sector developed, and training to lead agencies to report indicators provided</p> <p>2.3 Methodologies, tools, and templates for estimating GHG emissions reduction impacts in the Agriculture sector developed, and capacity building of stakeholders on the usage of the tools provided</p>	GE T	200,000.00	532,402.00
3. Enhancing tracking of support for NDC implementation	Technical Assistance	3. Thailand has systems and tools to effectively track international support received and report transparently as per international obligations	<p>3.1 Institutional arrangements to track support received established</p> <p>3.2 Web-based templates and training for reporting of the MRV[1] of support conducted</p> <p>[1] Monitoring, Reporting and Verification</p>	GE T	112,000.00	50,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
4. Strengthening of transparency framework for adaptation actions and resilience building	Technical Assistance	4. Thailand has tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development in the Agriculture sector	<p>4.1 Metrics, indicators and methodologies for Agriculture for the purpose of tracking the adaptation goals outlined in the NDC and NAP developed</p> <p>4.2 Templates for a national information gateway on climate risk, vulnerability and adaptation in the Agriculture sector developed and disseminated</p> <p>4.3 Capacity on integrating information on V&A^[1] into policy formulation, and on monitoring and evaluation of adaptation activities strengthened in the Agriculture sector</p> <p>^[1] Vulnerability and Adaptation</p>	GET	382,000.00	190,334.00
Sub Total (\$)					1,835,000.00	1,857,293.00
Project Management Cost (PMC)						
			GET		156,000.00	170,000.00
			Sub Total(\$)		156,000.00	170,000.00
			Total Project Cost(\$)		1,991,000.00	2,027,293.00

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Ministry of Natural Resources and Environment	In-kind	Recurrent expenditures	2,027,293.00
Total Co-Financing(\$)				2,027,293.00

Describe how any "Investment Mobilized" was identified

Not Applicable

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	Thailand	Climate Change	CBIT Set-Aside	1,991,000	189,145
Total Grant Resources(\$)					1,991,000.00	189,145.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required

PPG Amount (\$)

50,000

PPG Agency Fee (\$)

4,750

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	Thailand	Climate Change	CBIT Set-Aside	50,000	4,750
Total Project Costs(\$)					50,000.00	4,750.00

Core Indicators

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	125	60		
Male	125	60		
Total	250	120	0	0

Part II. Project Justification

1a. Project Description

1a. Changes in project design

There are significant changes in the alignment of the Capacity-building Initiative for Transparency (CBIT) Thailand project design from the original project concept note. While the four components under the Thailand CBIT Project remain basically^[1] unchanged from the original project information form to the present CEO Endorsement Document, the sectoral scope and budget allocation of all components and, hence, the scope of several outputs have changed substantially.

Components 1 and 2, their outputs and corresponding activities have narrowed down the sectoral scope. While the various outputs of components 1 and 2 in the original Project Identification Form (PIF) covered Energy, Waste, Industrial Processes and Product Use (IPPU), Agriculture and Forestry, in this proposal both components are targeting specific sectors. In the case of Component 1, its outputs target specifically Agriculture, Forestry and Land Use (jointly known as the AFOLU sector) and its various subsectors, as well as the Energy sector with regard to the development of emission factors. In the case of Component 2, it now focuses specifically on Agriculture.

Component 1 focuses on satellite image interpretation and the development of local emission factors. The activities relevant to the satellite imagery are necessary to establish clearer roles through the creation of a working group for the development of satellite image translation models, to develop appropriate set of guidelines, templates and tools for data collection, to provide appropriate training to relevant stakeholders, as well as to define QA/QC procedures for forest sector activity data acquisition. In addition, soil carbon emissions, necessary data to develop the country-specific emission factors of livestock and the emission factors of energy sectors will also be pursued under this Component.

Component 2 specifically focuses on "Open burning reduction" as a mitigation measure in the Agriculture sector. Therefore the activities associated to this component are covering the formalization of the institutional arrangements for monitoring purpose; the development of monitoring indicators and information matrix; and the design of resembled methodologies, tools, and templates. For the AFOLU sector, Thailand has divided the methodology for national GHG inventory estimation into agriculture sector and LULUCF sector. The agriculture sector is the second largest emissions producer in Thailand

(14.72%). Given the early stage of mitigation tracking in the agriculture sector, the government of Thailand wants to focus on this sector first. Non-evidence-based policies towards emissions reductions in the agriculture sector may affect many farmers in Thailand, including livelihoods and development. Additionally, Thailand has already received the support from the World Bank in order to develop Forest reference (emission) levels (FRL/FREL) as well as REDD+ strategy, which could help Thailand identify potential measures of LULUCF sector in the future (see CEO Endorsement Document, Table 3).

The reasons for narrowing down the scope and focusing on AFOLU can be summarized as follows:

? Impact ? After intensive stakeholder consultations, Office of Natural Resources and Environmental Policy and Planning (ONEP, the project management unit) saw a much clearer possibility to attain a deeper and longer lasting impact of the CBIT funding if it were focused on the AFOLU sector, which 1) has received comparatively less funding than other support providers (e.g. Energy), and 2) is at the stage where it has enough data so that enhanced transparency efforts can have a significant sector-wide effect

? Depth ? By focusing on part of the original sectoral scope, the activities and deliverables can advance further into implementation and self-sustainability, addressing several of the specific needs of stakeholders already, as opposed to only setting the framework.

? Sector-specific circumstances ? In the time that has passed from the submission of the original PIF and through the process of preparing the final project proposal, it has become clear that some of the sectors originally considered would benefit less than expected from CBIT funding at this point. This is explained in detail below.

? Budget and timeframe - Through the process of preparing the final project proposal and considering the additional uncertainties brought upon by the current pandemic situation, it was clear that the budgeting and human resources planning for the CBIT Thailand project could not have an optimal impact if it covered five entire sectors. Moreover, given the specific challenges of some of those sectors, it is unclear that CBIT activities could take place within the project's timeframe.

Additional reasons support a narrowing down of scope and deeper dive into AFOLU Component 1 and Agriculture in Component 2. The readiness of Thailand's AFOLU sector is at an early stage in terms of

Greenhouse Gas (GHG) emissions collections and reporting, yet the Thai government intends to officially incorporate it into the second Nationally Determined Contribution (NDC), expectedly from 2025 onwards. Thus, the reduction in scope both reflects a specific need identified by the implementing agencies and a pragmatic approach.

In the same line, Component 4 has shifted the focus from an overall framework for Adaptation Monitoring (no specific sector mentioned) to implementation in the Agriculture area. The National Adaptation Plan (NAP) process unveiled adaptation-relevant data availability and coverage issues in most of Thailand's identified adaptation sectors, and particularly in Agriculture. These sectors are in turn fundamental priorities for the Thai government concerning resilience and adaptation, thus constituting an adequate target sector to fully develop metrics, indicators, templates and capacity building for integration into policy formulation.

In order to materialize and sustain the outcome of Component 4, various activities are to be conducted including the analysis of relevant data and information regarding climate change impacts and M&E; the development and dissemination of templates for a national information gateway on climate risk and vulnerability; and, last but not least, the provision of trainings, as well as the training curriculum, for the Ministry of Agriculture and Cooperatives.

The number of beneficiaries of trainings has decreased compared to the PIF stage. This is because the sectors covered are narrower compared to the PIF, but the trainings would be more intense to ensure that agencies are well equipped to implement the mandate. Under this Component, the sectorial guidelines, templates and tools for data collection will enhance, harmonize and streamline the overall data collection processes from the multiple ministries and agencies involved in the AFOLU streams of the GHG inventory preparation, with a view to strengthen data flow, consistency and comparability. These guidelines and templates, complemented with a training provided to key staff in the different agencies, will support building in-house capacity over time and support timely and accurate preparation of future GHG inventory. Thus, the provision of training, which at the PIF stage was considered to include stakeholders outside the administration, will be particularly and intensively provided to existing staff, as well as new staff, of key departments and ministries that are responsible for supporting the data collection and GHG inventory preparation in order to ensure the sustainability of those capacity building activities over time.

Changes from the PIF in the wording of Components: The wording of Component 2 has been adjusted to reflect its focus on Agriculture, a key sector in terms of mitigation potential and strategic importance for Thailand, but not yet in its NDC. Thus, while the original PIF Component 2 read "Strengthening tracking and reporting of mitigation actions **for NDC implementation**", the modified Component 2 reads "Strengthening tracking and reporting of Thailand's mitigation actions"

Changes from the PIF in the wording of Outcomes and Outputs: In addition, there have been changes to outcome and output wording to reflect the narrowing down and deepened scopes elaborated upon above. All changes are summarized in table 1 below.

Table 1. Changes in outcome and output wording from the PIF

PIF Outcomes	CEO Endorsement Document Outcomes	PIF Outputs	CEO Endorsement Document Outputs
1: Thailand has the institutional and human capacities to regularly prepare accurate and transparent GHG inventories	1 Thailand has the institutional and human capacities to regularly prepare accurate and transparent GHG inventories of the Agriculture, Forestry and Other Land Use (AFOLU) and Energy Sector through its national GHG inventory system	1.1.1 Institutional arrangements, including processes and procedures for data collection and reporting are formalized	1.1.1 Institutional arrangements, including processes and procedures for data collection and reporting in the Agriculture, Forestry and other Land Use (AFOLU) sectors formalized
		1.1.2 Sectorial guidelines, templates and tools for data collection are developed and training provided to support operationalization of the web-based inventory system	1.1.2 Sectorial guidelines, templates and tools for data collection developed and training provided to support operationalization of the web-based inventory system in the Agriculture, Forestry and other Land Use (AFOLU) sectors
		1.1.3 Country-specific emission factors following IPCC ¹ Guidelines are developed in the sectors Energy, IPPU, and Agriculture	1.1.3 Country-specific emission factors following IPCC Guidelines developed in the Agriculture, Forestry and other Land Use (AFOLU) and Energy sectors
		1.1.4 Methodology and system for QA/QC ² for data from the sectors Energy, IPPU, Agriculture and Forestry is developed	1.1.4 Methodology and system for QA/QC for activity data from the Forestry sector developed
2: Thailand's transparency framework enabled to track progress in implementing its Nationally	2 Thailand's transparency framework in the Agriculture sector enabled to track progress in	2.1.1 Institutional arrangements for tracking of mitigation actions, including quality check of GHG reduction estimations, are formalized	2.1.1 Institutional arrangements for tracking of mitigation action , including quality check of GHG reduction estimations, formalized in the Agriculture sector

Determined Contributions (NDC) and report regularly as per Paris Agreement	implementing its mitigation action and report regularly as per Paris Agreement	2.1.2 Monitoring indicators and information matrix to track progress of NDC mitigation actions are developed, and training to lead agencies to report indicators is provided	2.1.2 Monitoring indicators and information matrix to track progress of mitigation action in the Agriculture sector developed, and training to lead agencies to report indicators provided
		2.1.3 Methodologies, tools, and templates for estimating GHG emissions reduction impacts in the sectors Energy, Waste, IPPU and Agriculture are developed, and capacity building of stakeholders on the usage of the tools is provided	2.1.3 Methodologies, tools, and templates for estimating GHG emissions reduction impacts in the Agriculture sector developed, and capacity building of stakeholders on the usage of the tools provided
3: Thailand has systems and tools to effectively track international support received and report transparently as per international obligations	3: Thailand has systems and tools to effectively track international support received and report transparently as per international obligations	3.1.1 Institutional arrangements to track support received are established	3.1.1 Institutional arrangements to track support received established
		3.1.2 Templates and training for reporting of the MRV ₃ of support are disseminated	3.1.2 Web-based templates and training for reporting of the MRV of support conducted
4: Thailand has tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development	4: Thailand has tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development in the Agriculture sector	4.1.1 Metrics and indicators and adjustment for subnational and local use of existing metrics, indicators and methodologies for tracking the adaptation goals outlined in the NDC are developed	4.1.1 Metrics, indicators and methodologies for Agriculture for the purpose of tracking the adaptation goals outlined in the NDC and NAP developed
		4.1.2 Template for a national information gateway on climate risk, vulnerability and adaptation are disseminated	4.1.2 Templates for a national information gateway on climate risk, vulnerability and adaptation in the Agriculture sector developed and disseminated
		4.1.3 Capacity on integrating information on V&A ₄ into policy formulation, and on monitoring and evaluation of adaptation activities strengthened in at least one sector	4.1.3 Capacity on integrating information on V&A into policy formulation, and on monitoring and evaluation of adaptation activities strengthened in the Agriculture sector

1Intergovernmental Panel on Climate Change; 2Quality Assurance/Quality Control; 3Monitoring, Reporting and Verification; 4Vulnerability and Adaptation

The change in breadth and depth in the components has also resulted in a significant reallocation of funding across the project components, compared with the PIF. Specifically, the budget of Component 1 has increased significantly, whereas the budgets of Components 2, 3 and 4, as well as their allocated co-financing have decreased to various extents.

The PIF budget figures and current ones are summarized in Table 2.

Table 2. Budget allocation by component at the PIF stage and in the current proposal

Component	GEF budget in PIF	Co-financing in PIF	GEF budget in current proposal	Co-financing in current proposal
1	480,000	260,000	1,141,000	1,084,557
2	600,000	300,000	200,000	532,402
3	326,000	190,000	112,000	50,000
4	404,000	200,000	382,000	190,334

The complete range of changes by component, the added value of such changes, and other relevant activities providing further support are summarized in table 3 below:

Table 3. Changes from PIF and justification of changes

Outcomes	Changes from PIF	Justification and added value of changes	Activities providing support in related areas

<p>1. Thailand has the institutional and human capacities to regularly prepare accurate and transparent GHG inventories of the Agriculture, Forestry and Other Land Use (AFOLU) and Energy Sector through its national GHG inventory system</p>	<p>The scope of this component has been narrowed down from five sectors (Energy, IPPU, Agriculture, Forestry and Waste) to Agriculture, Forestry and Land use (AFOLU) and Energy (output 1.3 only).</p>	<p>The institutional arrangements, human capacities and overlap of agencies in the AFOLU sector with regard to GHG inventories (addressed in Output 1.1) are most complex. The AFOLU sector is a priority sector in the Thai context as it employs one third of the country's labour force and is a major economic factor, as Thailand is a large exporter of agricultural commodities.</p> <p>The activities within this component are more and of a much greater depth than the ones at the PIF stage, particularly on the fieldwork and data collection of aerial photography and satellite imagery (output 1.2) and the development of local emissions factors for selected fuels within Energy, Manure management and Agricultural soils (output 1.3).</p> <p>Other sectors are receiving a great amount of upcoming support compared to what was expected during the PIF stage (see column on the right).</p>	<p>Thailand received a large amount of support for enhancing GHG data collection in other sectors, notably through the Thai German Climate Programme, with a large MRV component (e.g. Energy and Waste). GIZ also provides support within the Transport sector, while GGGI provides support in the Industry sector.</p> <p>Generally, the capacities for GHG data collection are more advanced within the Energy sector, which represents the largest sector in terms of GHG emissions. A robust energy sector MRV system for establishing greenhouse gas inventory in the electricity and other energy from large consumers (large buildings & industry) sub-sector exists in Thailand.</p>
	<p>The GEF budget of this component has increased from USD 480,000 to USD 1,141,000.</p>	<p>This component entails large efforts of fieldwork and data collection, trainings, efforts and public consultations compared to others, and at a much more intense level than what was envisioned during the PIF stage.</p>	

<p>2. Thailand's transparency framework in the Agriculture sector enabled to track progress in implementing its mitigation action and report regularly as per Paris Agreement</p>	<p>The scope of this output has been narrowed down from five sectors (Energy, IPPU, Agriculture, Forestry and Waste) to the Agriculture sector.</p>	<p>This component has narrowed down to target a key damaging, carbon intensive and difficult to deal with agricultural practice of open burning, with large environmental, health and economic impacts including contributes to GHG emissions.</p> <p>Other sectors are receiving a great amount of upcoming support compared to what was expected during the PIF stage (see column in the right).</p>	<p>Thailand received NDC-related support through GIZ (Thai German Climate Programme, RAC NAMA, and Thai Rice NAMA), through UNDP's NDC Support Programme, through GGGI (development of NDC action plan in industrial sector) as well as other actors. More information can be found in the Table 4 in the baseline section.</p> <p>For instance, ICAT Thailand has strengthened Thailand's MRV system for the Industry and Building sub-sectors, assessing gaps and needs for data collection and reporting in industry and buildings, and providing recommendations on contribution of industry/buildings sub-sector to national MRV in context of NDC monitoring</p> <p>In preparation of the NDC Roadmap and building on the existing structure for tracking of NAMAs, ONEP, the Thailand Greenhouse Gas Management Organization (TGO) and agencies in charge of the mitigation measures have collaborate to develop MRV guidelines, which will facilitate annual monitoring and reporting of the mitigation actions under the NDC Roadmap in its implementation phase from 2021 to 2030.</p>
	<p>The GEF budget for this component has decreased from USD 600,000 to USD 200,000.</p>	<p>The budget has decreased in parallel with the reduction in scope</p>	

<p>3. Thailand has systems and tools to effectively track international support received and report transparently as per international obligations</p>	<p>The GEF budget for this component has decreased from USD 326,000 to USD 112,000.</p>	<p>Since the approval of the PIF, activities in this area have started with fiscal budget. ONEP has initiated the development of a tracking system for international climate support received. CBIT activities will build upon this system and therefore the requested budget in this component has decreased and CBIT resources will be used to further strengthen the system and ensure there are no gaps with respect to the Paris Agreement reporting standard.</p>	<p>In addition to ONEPs self-initiated tracking system for support received, UNDP supports Thailand in developing a Climate Change Financing Framework, including climate budget tagging. However, ONEP's tracking system is most relevant for this CBIT project.</p>
<p>4. Thailand has tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development in the Agriculture sector</p>	<p>This output did not have a sectoral focus (thus assumed to cover all sectors), and now it focuses on Agriculture.</p>	<p>The Agriculture sector is one of the priority sectors for adaptation in Thailand's climate change master plan and NDC. Thailand is a large producer of agricultural crops, but the country is adversely affected by climate change impacts such as flooding's and droughts. As such, the Agriculture sector is of strategic importance in terms of population-wide increase of resilience in livelihoods.</p>	<p>Since the submission of the PIF, the NAP-Ag project by the FAO and UNDP has assisted Thailand in advancing monitoring and evaluation within the Agriculture sector and has explored potential indicators. The project also contributed to the Agriculture Strategy on Climate Change 2017-2021, a key policy document for adaptation within the Agriculture sector. The CBIT project will build upon the efforts and results of the NAP-Ag project and advance the M&E work in the sector, which remains to be a challenge.</p>
<p>The GEF budget for this component has decreased from USD 404,000 to USD 382,000 (though this includes USD 52,000 of M&E costs, a significant proportion of the project's total M&E costs)</p>	<p>The budget has decreased, on account of the reduction in scope, but important resources are still needed for the extensive fieldwork and stakeholder consultations that are required in a very diverse and atomized sector like Agriculture.</p>		

Notwithstanding the changes are in component scope and relative budgets, the overall objective of strengthening Thailand's institutional and technical capacities to comply with the Enhanced Transparency Framework of the Paris Agreement is supported by the current proposal, particularly considering the synergies with other ongoing and upcoming projects presented in Table 3 and further explored in the sections below.

1b. Project Description

1) Global environmental and/or adaptation problems, root causes and barriers that need to be addressed

The Enhanced Transparency Framework

The Paris Agreement established an Enhanced Transparency Framework (ETF) for all Parties with a view to build mutual trust and confidence, and provide a clear understanding of climate change action towards limiting the global temperature increase "to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels". To achieve this goal, Parties have to undertake domestic climate actions, and regularly prepare and communicate their ambitious efforts in the form of nationally determined contributions (NDCs) that they intend to achieve. Parties further have to account for their NDCs in a transparent, accurate, complete, comparable and consistent manner.

The "Modalities, procedures and guidelines" (MPGs), the implementation guidelines for the Enhanced Transparency Framework, outline in detail the reporting requirements for all country Parties, developed and developing country Parties alike. Building on the existing transparency arrangements under the United Nations Framework Convention on Climate Change (UNFCCC), the MPGs require Parties to regularly provide a national greenhouse gas (GHG) inventory report and information necessary to track progress of the implementation of their NDCs. The reporting on climate change impacts and adaptation is voluntary for all country Parties. Developed country Parties are further required to provide information on financial, technology transfer and capacity-building support *provided*, while developing country Parties are *encouraged* to provide information on financial, technology transfer and capacity-building support *needed* and *received*. Developing country Parties that provide support to other developing country Parties are equally encouraged to report on their support *provided*. The different informational elements are to be reported to the UNFCCC every two years in the form of a "Biennial Transparency Report" (BTR), while the greenhouse gas inventory report can be reported as a standalone report.

While the MPGs provide a few flexibility provisions to developing country Parties, for instance with regard to the number of greenhouse gases covered, they overall signify a strengthening of the reporting requirements for developing country Parties, both with regard to frequency^[2] and scope of reporting. Even the use of flexibility provisions by developing countries, requires a detailed description of their capacity constraints and estimated timeframes for improvements in relation to those capacity constraints. The new reporting requirements thus demand substantial and immediate progress in developing countries' domestic monitoring, reporting and verification (MRV) systems and strategic decarbonization planning. This entails moving from often uncoordinated, not consistently updated and disparate methodologies for data collection to integrated and robust systems. The MPGs further require developing countries to set up new transparency governance structures, or strengthen existing ones, to develop and implement MRV methodologies, and update, implement, and integrate new data and information flows with pre-defined periodicity. A key condition for successful implementation of the Paris Agreement's transparency requirements is therefore the provision of adequate and sustainable financial support and capacity building to enable developing countries to significantly strengthen their efforts to build robust domestic reporting processes.

Thailand's climate change risks

Thailand is an upper-middle income country and the second largest economy in Southeast Asia with an expected annual Gross Domestic Product (GDP) growth rate of 3%. The economic growth has caused a continuous increase of GHG emissions as well as environmental costs, including large losses of primary forest areas in the country. At the same time, climate change poses an increasing challenge for Thailand which, due to its geography and socio-economic characteristics, is highly vulnerable towards the adverse impacts of climate change

With a total coastline of over 3,150 kilometers, where more than 12 million people live, Thailand is highly vulnerable towards coastal flooding, and ranks among the ten most affected countries by climate change. The country is experiencing an increase in temperatures and changes in rainfall patterns, leading to severe droughts, as well as floods and subsequent landslides. The country has been affected by a number of extreme floods in recent years, most notably the flood in 2011. The risks for flooding are exacerbated by land conversion activities in particular the Northeast of the country in the province of Nan, where forested hills are converted to maize fields, driven by a growing demand for fodder for poultry production in the region. While the forests slowed down the water flow, in case of heavy rainfall, the water now flushes down the bare hills into the Nan river, which is one of the most important tributaries to the Chao Phraya river which flows through the capital of Thailand.

As one of the largest rice producers in the world and with one third of the country's labor force employed in the agricultural sector, those climatic changes lead to great economic losses and jeopardize the country's food security. Drought severely affects subsistence farmer as they largely depend on rain-fed agriculture, and approximately 80% of the farmland in the North and Northeast of Thailand is without irrigation. The impacts on infrastructure through floods is also substantial, and the flood in 2011 alone led to economic damages and losses of approximately US\$ 46.5 billion, mostly within the Bangkok metropolitan area. Adaptation to climate change is therefore seen as a top priority in the country.

Overall, the country of Thailand is divided into four major natural geographic regions with a mountainous north, an arid northeast with the Korat plateau, the fertile central plains, including the Chao Phraya River basin and the southern peninsula. The country has a coastline of over 2500km along the Gulf of Thailand in the east and the Andaman Sea in the west. Thailand's climate is classified as tropical savanna in the mainland and tropical monsoon in the Southern Peninsula, with influences of monsoons and tropical hurricanes. Overall, there are three distinct seasons in Thailand (hot, wet and mild) with the highest temperatures usually occurring in April. The mean annual temperature ranges from 22-32°C and the average range of annual rainfall is 1,300-2,000 mm, where especially the Southern Peninsular receives more rainfall on average than the mainland. Thailand is already experiencing the effects of climate change and has experienced a large number of floods, storms and extended drought periods, with particular challenges agricultural sector. Thailand ranks number eight of the countries most affected by extreme weather events in the period 1999 to 2018 (long-term climate risk index) in the Global Climate Risk Index^[3], followed by Nepal and Dominica. The Global Climate Risk Index analyses the quantified impacts of extreme weather events both in terms of fatalities as well as economic losses and is based on data by the Munich Re NatCatService. For Thailand, a total number of 147 extreme weather events have been recorded for the period of 1999 to 2018 with a total death toll of 140,000 and a total economic loss of 7 764.06 in million USD in purchasing power parity.

As per the World Bank's Climate Change Knowledge Portal^[4], based on the Coupled Model Intercomparison Project, Phase 5 (CMIP5) models included in the IPCC's Fifth Assessment Report (AR5), key projected climate trends for Thailand are the following

- A mean annual temperature increase of 1.4 to 1.8°C by the 2060's, and 3.0 to 3.8°C by the 2090's.
 - The projected rate of warming is similar in all three seasons, but more rapid warming is projected for the northern and central regions of the country than in the southern, coastal regions.
 - The annual precipitation is projected to rise by 81.77mm (-270.38mm to 532.10mm) in the period 2040-2059 (RCP 8.5)
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- Overall, different models show a range of changes in precipitation for Thailand with projections varying between +28% to +74% by the 2090's.
- The percentage of 'wet days' is projected to largely increase in all seasons with the maximum increase for November and the February to May season

In addition to that, further climate projection as presented in Thailand's Third National Communications are the following:

- Regarding extreme weather, an increase in the number of days with a maximum temperature of more than 40°C is projected for the lower part of Northern Thailand and the upper part of Central Thailand. Consecutive dry days in Northern, Central, Western and North-eastern Thailand are projected to amount to roughly 100 days.
- The number of days with a daily rainfall of more than 35 mm is projected to be 15-20 days for Eastern and Southwestern Thailand, while the number of days with more than 90mm is projected to be 3-5 days for Eastern and Southern Thailand.

According to the Center for Hazards and Risk Research at Columbia University^[5], Thailand is significantly affected by hydrological and drought events, particularly in the central, eastern, and southern regions. The entire country is severely impacted by floods with regard to mortality and impacts on GDP, whereas droughts only rank in the moderate to lower deciles Overall, the risk profile of Thailand to natural disasters include the following^[6]:

- Moderate risk to tropical cyclones
- High risk to floods
- Moderate risk to drought, land slide, fire, earthquake and agricultural pests & diseases

Regarding floods, Bangkok and its vicinities as well as the Chao Phraya river basin as well as the areas along the Chi and Mun river are identified as vulnerability hotspots. The mountainous North of the country is hereby particularly vulnerable towards flash flooding and landslides, while the northeastern Korat Plateau is also prone to flash flooding as well as freshwater inundation during the rainy season. The central Chao Phraya River Basin is also prone freshwater inundation during the rainy season. The southern peninsula is vulnerable towards mudslides and forest fires as well as tropical storms and rainfall- and ocean-induced flooding in low-lying and coastal areas. The central part of the northern region and the northeastern region which is not connected to the Mekong river are vulnerability hotspots for drought. The country's Agriculture sector has been recognized in the country's strategic climate change plans (e.g. NAP and NDC) as particularly vulnerable to climate risks in the form of

extreme rains event and floods in some parts of Thailand and extended periods of drought in other areas. In addition to that, temperatures above 34°C negatively affect rice yields.

To cope with disaster and climate risks, the Government of Thailand has formulated the Disaster Prevention and Mitigation Act 2007, the Disaster Mitigation Plan by the Ministry of Defense and the National Disaster Risk Management Plan (2015), which has been updated to include the principles and tasks of the Sendai Framework for Disaster Risk Reduction and to consolidate strategies for implementation, including a focus on disaster risk reduction, the application of an integrated emergency management system, strengthening and enhancing efficiency of sustainable disaster recovery or build back better and safer, and promoting international cooperation on disaster risk reduction. It aims to serve as a tool for reducing the impact of disasters, realizing disaster risk management standards in every community as well as for further integrating disaster risk reduction thinking and methods into the national sustainable development process. This plan outlines implementation strategies in accordance with the country's Disaster Prevention and Mitigation Act (2007). All relevant agencies are required to use this plan as a blueprint, framework and guideline for national disaster management actions.

Thailand's Climate Change Master Plan also includes several medium- and long-term goals related disaster management. The medium-term goal for 2020 includes the development of effective and comprehensive early warning measures such as pest and meteorological forecasting for the agricultural sector and natural disaster management. As long-term (2050) and ongoing goals, the soil and water restoration in areas with repeated natural disasters shall be enhanced, and the proportion of farmers in areas at risk who have received training in natural disaster prevention shall be increased. Additionally, vigilance and early warning systems for natural disasters in areas that are at risk shall be strengthened and overall, the number of fatalities and losses due to natural disasters shall be limited. The adaptation strategy included in the Climate Change Master Plan further lists specific activities for natural disasters management specific to the agriculture sector, including the development of agricultural risk maps that will aid in forecasting the occurrence of disasters such as outbreaks of plant and animal diseases flooding, drought, landslide, saltwater intrusion as well as the development of accurate and long-range forecasting and prediction techniques for climate variation and extreme weather events in Thailand. Overall, the Climate Change Master Plan aims to enhance adaptive capacity in all sectors but emphasizes sectors with high sensitivity to change that possess low capacity for handling the impacts. This includes low-income citizens, communities in areas with natural disaster risks as well as agricultural and business groups relying primarily on weather and natural resources.

Regionally, the ASEAN Agreement on Disaster Management and Emergency Response has been formed with the objective to provide effective mechanisms to achieve substantial reduction of disaster losses in lives and in social, economic and environmental assets of ASEAN member parties and to jointly respond to disaster emergencies.

Thailand's response to climate change

Recognizing these serious threats posed by climate change, and to safeguard the livelihoods of the population dependent on agriculture and in support of the global efforts to address climate change, Thailand ratified the UNFCCC and the Kyoto Protocol (KP) in 1994 and 2002 respectively, and the Paris Agreement in September 2016. Thailand is committed to mitigate its emissions and is increasing its efforts towards a low-carbon economy. At the Conference of the Parties (COP) 20 in Lima in 2014, Thailand pledged to lower its CO₂ emissions from 7-20% by 2020, compared to Business as Usual (BAU), through Nationally Appropriate Mitigation Actions (NAMAs) within the sectors Energy and Transport. Important policies and plans to promote low-carbon and climate resilient development and green growth in Thailand include the 12th National Economic and Social Development Plan (2017-2021) and the 20-Year Strategy (2017-2036) by the National Economic and Social Development Board (NESDB) and the National Policy on Green Growth (2013-2030).

The country's highest-level policy document is the 'Thailand Climate Change Master Plan' (2015-2050), developed by the Office of Natural Resources and Environmental Policy and Planning (ONEP) and its Climate Change Management and Coordination Division, in close collaboration with the public. The Climate Change Master Plan (CCMP) serves as a framework document and mechanism for the country's response to climate change for the transition towards a low-carbon and climate-resilient society, in line with a sustainable development pathway and based on the philosophy of sufficiency economy. To achieve this vision, the CCMP specifies three key strategies: 1) Adaptation for coping with the negative effects of climate change, 2) Mitigation of greenhouse gas emissions and increase of greenhouse gas sinks and 3) Strengthening the capacity of human resources and institutions and to manage the risks from the effects of climate change and cross cutting issues and 18 sectoral priorities, six of which are focused on adaptation. The document sets out a number of short- (2016), medium- (2020) and long-term (2020-2050) targets for the three strategies. The CCMP acts as five-year rolling plan and is under revision for 2020. Sectoral efforts to address climate change have also been underway. In the Agriculture sector for example, the Agriculture Strategic Plan for Climate Change (ASPCC) (2017-2021) was developed in alignment with the Climate Change Master Plan to guide adaptation in Thailand's agriculture sectors.

Thailand communicated its Intended Nationally Determined Contribution (INDC) on 1 October 2015 and its first NDC on 21 September 2016 to the UNFCCC. The NDC (2021-2030) includes a mitigation and adaptation component and lays out an economy-wide (excluding Land Use, Land-Use Change and Forestry, or LULUCF) GHG emissions reduction of 20 percent compared to the business-as-usual (BAU) level, estimated at 555 MtCO₂ in 2030. Through additional means of implementation via capacity building, financial resources and technology development and transfer, the emission reduction goal is expected to be increased to 25%. Thailand's adaptation component includes a large number of prioritized adaptation efforts such as the promotion of sustainable agriculture and the increase of

national forest cover to 40% through local community participation. To raise Thailand's adaptive capacity, the need for adequate financial resources and technology development and transfer is pointed out, especially for the agriculture sector and for water resource management.

For the implementation of its NDC and to achieve Thailand's emission reduction goal, an NDC Roadmap has been developed through a national consultative process. The cabinet approved the NDC Roadmap on Mitigation for the period from 2021 to 2030 on May 23, 2017. The NDC Roadmap lays out mitigation actions in the sectors Energy & Transport, Waste and Industrial Processes and Product Use (IPPU) and is based on a number of national plans such as the Energy Efficiency Plan and the Alternative Energy Development Plan. The NDC Roadmap is envisioned to bring about a GHG emission reduction of 115.6 MtCO_{2e}.

Responding to requirements laid out in the Paris Agreement, Thailand is currently in the process of revising its NDC with the support of the NDC Support Programme by the United Nations Development Programme (UNDP). Thailand further responds to the call to Parties of the Paris Agreement to submit a long-term low greenhouse gas development strategy in 2020. ONEP is currently in the process of developing the country's first Long Term Strategy for Climate Change, which will be aligned with the Climate Change Master Plan and will be built upon the NDC Roadmap 2030 to achieve low GHG emissions and climate-resilient growth. ONEP is in the process of drafting the Climate Change Act, which will be subject to a public hearing process, and is expected to be submitted to the Cabinet in March 2021. Thailand is further planning to submit a new NDC by 2025 and to this end it will explore the inclusion of mitigation actions within the Agriculture sector in the new NDC.

In order to effectively plan, implement and monitor these climate actions, and to overcome existing gaps and barriers, it is necessary to enhance Thailand's institutional, human and technical capacities in the medium- and long term. Some of the main gaps include methodologies for GHG data collection, compilation and reporting especially from AFOLU, the need for enhanced technical capacities of key staff involved in the inventory process and the need for a transition towards the 2006 IPCC Guidelines. Addressing these gaps will significantly enhance the GHG inventory quality and will enable the country to report GHG inventory according to the 2006 IPCC Guidelines. In addition, Thailand will be able to track progress of NDC implementation by accounting on emission and removal corresponding to its GHG inventory.

Thailand's AFOLU Sector

The contribution of the AFOLU sector to Thailand's GDP has declined over time, yet it remains a major economic sector in the country, making Thailand one of the world's top exporters of

commodity crops? (FAO, 2018)[7]⁷. Agriculture contributed to 12.7% of Thailand's GDP in 2015 and employed one third of the national labor force, while roughly of Thailand's land is used for agriculture. As reported in Thailand's second BUR, the Agriculture sector contributed with 50,919.34 GgCO₂eq or a share of 15.98% to Thailand's total GHG emissions, making it the second largest source of GHG emissions in the Thai context, followed by Industrial Processes and Waste in 2013. While the overall GHG emissions from the Agriculture sector increased between 2000 and 2014, the share of the agricultural emissions to Thailand's total emissions decreased from 18.4% to 15.98%, due to a larger share of emissions from the Energy sector. The Land Use, Land Use Change and Forestry (LULUCF) sector remains a sink in Thailand and stood for a removal of -86,102 GgCO₂eq in 2013, increasing from -11,995 GgCO₂eq in 2000. Within the Agriculture sector, Rice Cultivation represents the largest source of GHG emissions (54.72 %), followed by Agricultural Soils (22.95%), Enteric Fermentation (11.79%), Manure Management (6.95%) and Field Burning of Agricultural Residues (3.59%). The greenhouse gas emissions resulting from agricultural activities are in the order of magnitude methane (CH₄), carbon monoxide (CO), nitrogen oxide (NO_x) and nitrous oxide (N₂O).

COVID-19

The responses and policies of governments throughout the world during the SARS-nCOV-2 virus novel Coronavirus disease (COVID-19) pandemic have drastically altered energy demand around the world, restricting industrial and transport activity, among others. Global annual GHG emissions may drop by as much as 7% in 2020 if some restrictions remain worldwide until the end of the year. Along with concurrent factors such as the relative prices of fossil fuels and renewables, this opens opportunities for developing countries to achieve relative sustainability and carbon reduction gains. Thailand has weathered the pandemic much better than many other comparable countries, with few cases and 2% lethality rate among those infected[8]⁸, and the WHO identified Thailand together with New Zealand as a success story[9]⁹.

In addition to the pandemic, Thailand had to cope with forest fires in the north of the country and due to the resulting air pollution citizens were ?focused on wearing masks for another reason?[10]¹⁰. Moreover, Thailand was hit by a nationwide drought, considered as the worst drought in 40 years[11]¹¹ with a large impact on the countries' agricultural sector and an economic loss of 46 billion

baht. Despite the economic impact of the pandemic, it is stated that the "prolonged droughts across the country had threatened economic disaster well before the emergence of the virus"[12]¹². The combination of the pandemic, drought and forest fires has been described as "Thailand's triple disaster"[13]¹³. The Thai government prepared a Covid-19 response package of almost 2 trillion baht and is supported by UNDP in planning and implementing a "build-back-better approach"[14]¹⁴. Although there are no specific sustainability-oriented policies in place yet for the recovery phase in Thailand, a strong accountability and transparency system is paramount to prevent backsliding in climate commitments. All proposed components, outcomes, outputs, activities and deliverables in this project are directly relevant to such accountability.

2) Baseline scenario and any associated baseline projects

Thailand's climate change efforts are led by the National Committee on Climate Change Policy (NCCC), which was established in accordance with the Regulations of the Office of the Prime Minister on Climate Change Actions 2007 (announced on 20 June 2007) and their revision in 2009 (announced on 27 September 2009). The NCCC, chaired by the Prime Minister, is responsible for national climate change policy and strategy, national positions in international negotiations under the UNFCCC as well as the monitoring and evaluation of the implementation of policies and strategies by government agencies. The NCCC comprises representatives from 12 ministries, as well as other governmental agencies such as the Bureau of Budget as well as a group of five to nine experts. Work in the NCCC is conducted through its five sub-committees: 1. Climate Change Policy and Planning Integration, 2. Climate Change Knowledge and Database, 3. Climate Change Negotiation and International Cooperation, 4. Action for Climate Empowerment and Public Relations and 5. Laws. Under the Subcommittee Climate Change Knowledge and Database, five sectoral working groups were set up to review the GHG inventory and provide recommendations on suitable options for a Measurement, Reporting, and Verification (MRV) system suitable for the country. The Office of Natural Resource and Environmental Policy and Planning (ONEP), under the Ministry of Natural Resources and Environment (MoNRE), serves as secretariat to this subcommittee.

The regular submission of National Communications (NC) is part of the transparency obligations under the UNFCCC. The National Communication is a vital medium for the exchange of information on

Parties? responses to climate change and the UNFCCC process. With support from the Global Environment Facility (GEF) through United Nations Development Programme (UNDP), Thailand submitted its Initial National Communication (INC) in November 2000, its Second National Communication (SNC) in March 2011 and its Third National Communication (TNC) in August 2018. Thailand has submitted its First Biennial Update Report (FBUR) in December 2015 and went through the International Consultation and Analyses process (ICA) in 2016. The Second Biennial Update Report (SBUR) was submitted in 2017 and passed the Facilitative Sharing of Views (FSV) process in 2019. The GHG inventories as part of these past documents were based on the 1996 Revised IPCC Guidelines and cover the sectors Energy, Industrial Processes, Agriculture, Land-use Change and Forestry as well as Waste.

ONEP, as the National Focal Point (NFP) to the UNFCCC and the KP, leads the preparation of Thailand's national GHG inventories. Based on data provided by different lead agencies, ONEP prepares estimations of GHG emissions for all sectors, which are then submitted to the five working groups under the Sub-Committee on Climate Change Knowledge and Database for review and quality assurance (QA). The final GHG inventory as one component of the NC and BUR is approved by the National Committee on Climate Change Policy before submission to the UNFCCC.

The Working Group on GHG Inventory and Mitigation Measures under the Sub-committee on Climate Change Knowledge and Database is responsible for quality check for the results of GHG emission estimations and for approving the methodology and emission reduction results of mitigation measures, outlined in Thailand's NAMA roadmap. The emission reduction results are then verified by the Sub-committee on Climate Change Knowledge and Database and approved by the NCCC.

Thailand does not have yet a comprehensive MRV system for tracking mitigation actions across all sectors. However, Thailand has developed a sector based MRV system to monitor progress in the implementation of domestic NAMAs in the transport and energy sector. The current MRV system for these NAMAs tracks mitigation action results of GHG emissions and energy generated / converted / saved (incl. biofuels). Within the energy sector, Thailand has a robust MRV system for determining GHG emissions from electricity generation, and for energy efficiency in large buildings and industry. This MRV system is being strengthened and includes data collection and reporting frameworks from various organizations and entities such as power plants and large buildings & factories.

With support from the Australian Government, Thailand has established the Thailand Greenhouse Gas Emissions Inventory System (TGEIS), a software-based data system based on the 2006 IPCC Guidelines to enable data input and estimation from the five main sectors. To complete the estimation, lead agencies from the five different sectors compile the activity data and check the quality of the data

before submitting it to ONEP, who is in charge of managing and maintaining the TGEIS. The TGEIS has first been put to use for the national GHG inventory GHG emissions to be reported on the Third Biennial Update Report (TBUR), which is to be submitted to the UNFCCC in 2020.

In addition to the TGEIS system, ONEP itself has initiated an international support tracking system. The interface and basic reporting templates have been designed and a first set of workshops, half day workshop for donors and another half day to users (ONEP staff), have been held in August 2020. Similar to the TGEIS, ONEP inputs and adjusts raw data received on support received, such as project information, budget received, donors, project duration and implementation status, from agencies, which after processing can be viewed by the wider public and donors. This basic system is useful to obtain a basic overview of the main items of support received but needs further review on the accuracy of data and the potential development to meet the requirements set forth in the MPGs, particularly those beyond the basic ones. Moreover, with the current system it is difficult to verify the transparency of support information provided as well as support received from data owner agencies. The data will be collected on an annual basis.

As explicitly stated in its NDC, adaptation is a "top priority in Thailand's national response to climate change". The country consistently ranks at the top of climate vulnerability and risk indices, suffering from extreme weather, sea level rise, and climate-sensitive health impacts. Moreover, such impacts are magnified in the country's poor and vulnerable groups. In line with the country's national communications and NDC, the CCMP 2015-2050 prioritizes six adaptation components: 1) Flood, drought and water management, 2) Agriculture, 3) Tourism, 4) Public health, 5) Natural resource management, 6) Human settlement and security. On that basis, Thailand started in 2015 the process for the development of its National Adaptation Plan (NAP), considering climate projections and assessments of vulnerability and risk in six priority sectors. The draft NAP was completed in January 2017, and its implementation piloted with support from the Deutsche Gesellschaft für International Zusammenarbeit (GIZ) in three line-ministries covering three sectors (Tourism, Public Health, and Human Settlement and Security), and in four pilot geographical areas, covering the four regions of Thailand.

Adaptation has also been integrated into sectoral adaptation efforts, for instance within health (H-NAP) and agriculture (NAP-Ag). The latter project has also contributed to the Agriculture Strategic Plan on Climate Change. Outcomes and lessons learned of the NAP process include among other the need for proper databases for the development of concrete targets and indicators. Lack of data hinders the breakdown of projections onto regional and sectoral level and undertaking economic analyses. According to GIZ¹⁵, sound data basis is equally important for developing a monitoring system and defining indicators for clear adaptation targets. Initial risk assessments have been mainly qualitative and based on pre-existing data and projections. The NAP document was officially approved by the

National Committee on Climate Change Policy in November 2018. Overall, the timeline of the NAP includes a preparation period from 2018-2021 and an implementation period from 2022 - 2026.

With the provision of international support, Thailand has engaged in a number of projects and initiatives with a view to enhance its institutional and technical capacities for transparency. These projects are summarized in tables 4 and 5 below.

Table 4. Projects related to transparency for climate change mitigation and adaptation with international support

Project Name	Project Period	Donors/ Agencies	Description of Support	Linkages to the CBIT Project
MITIGATION				

<p>Thailand Forest Carbon Partnership Facility (FCPF) Readiness Preparation Project</p>	<p>2015 - 2024</p>	<p>WB[16]^{16/} FAO[17]¹⁷</p>	<p>The project provides targeted support for Thailand's Reduced Emissions from Deforestation and Forest Degradation; Fostering Conservation, Sustainable Management of Forests, and Enhancement of Forest Carbon Stock (REDD+) readiness by financing key pre-investment activities.</p> <p>Sub-project: Forest Reference Level Project (2018-2019) with support from FAO</p> <p>The project supported Thailand in developing the Forest Reference Level (FRL), as benchmark against to measure emissions reductions from implementing a national REDD+ program. In addition, Thailand's National Forest Monitoring System (will be improved and updated as a practical tool for national forest policy and planning.</p>	<p>Thailand's REDD+ efforts will benefit from the activities under Component 1 of the CBIT project including enhancing the institutional arrangements, providing data-sharing agreements and sectorial guidelines, templates and tools within the AFOLU sector. The CBIT project will thus facilitate REDD+ activities and the development of a National Forest Monitoring System in the future, especially with regard to improved institutional arrangements and data collection. CBIT's efforts in improving QA/QC within Forestry will increase the accuracy of data from the forestry sector. Accurate data is a pre-condition for results-based payments under REDD+ and any other carbon market mechanism.</p> <p>CBIT will also support the country in satellite image interpretation (under Component 1) which will benefit multiple agencies within the AFOLU sector.</p>
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<p>Thailand Hydrochlorofluorocarbons (HCFC) Phase-out Project Phase I and Phase II</p>	<p>2014-2018 and 2020-2023</p>	<p>WB</p>	<p>The project aims to reduce HCFC consumption in the air-conditioning, foam, and commercial refrigeration sectors in order to contribute to Thailand's efforts to meet its HCFC consumption phase-out obligations and also contribute to climate change mitigation regarding potent greenhouse gases reduction. The Phase 1 of the project resulted in a reduction of 7.341 metric tons HCFS equivalent to 11.9 million tons CO₂ avoided and thus supported Thailand's Nationally Determined Contribution goal of reducing greenhouse gas emission by 20 percent by 2030^[18].</p>	<p>This HCFC project covers one of the key IPPU sectors in Thailand with Thailand being the world's ten largest importer and consumer of HCFCs. The HCFC project aims to reduce HCFC by substitution through Hydrofluorocarbons (HFCs), which are less harmful to the ozone layer, as well as to outline related MRV procedures. HFCs are one of the seven gases to be reported in the future Biennial Transparency Reports. As this project contributes to Thailand's NDC Roadmap which covers refrigerant replacement (and clinker substitution) within the IPPU sector, the IPPU sector has been removed from Component 2 of the CBIT project (based on PIF).</p>
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<p>Fourth National Communication and Third Biennial Update Report to the UN Framework Convention on Climate Change (UNFCCC)</p>	<p>2019 - 2023</p>	<p>GEF/ UNDP[19]¹⁹</p>	<p>The project provides support to Thailand for the preparation of its Fourth National Communication (FNC) and the Third Biennial Update Report (TBUR).</p>	<p>The FNC/TBUR project supports Thailand with general GHG inventory and MRV activities in all sectors, while the CBIT project takes a deep dive in the AFOLU sector to be expanded to other sectors. The preparation of the TBUR is Thailand's last BUR exercise and countries are encouraged to use this opportunity to prepare for the forthcoming BTR, through for instance a hybrid report, as many elements are similar. The general approach of the TBUR (and FNC) project and the sector-focused approach thus complement each other and jointly lay the foundation for the preparation of BTRs from 2024 onwards.</p>
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Partnership for Market Implementation (PMI)	Start in early 2021	WB	<p>This project is a follow-up from the earlier Partnership Market Readiness project (2013-2019) which provided support in developing an MRV system for the Energy Performance Certificate scheme, including data reporting templates for factories and buildings and MRV Guidelines for each targeted sector. Seven industrial sectors and four building types were targeted. The industrial sectors are: i) food & beverage; ii) cement; iii) ceramics; iv) paper & pulp; V) iron & steel; Vi) petrochemical plants; and Vii) thermal power plants. The project further supported legal & institutional framework for the establishment of an integrated reporting system to support the establishment of the Emission Trading System. The follow-up project, which will be implemented in 30 countries, will include, among other, activities to enhance capacity of GHG data collection and management, design and enhance existing Measurement, Reporting and Verification (MRV) framework and to enhance capacity development to create institutional structure implementing</p>	<p>Thailand is considering an emission trading system and the TGO has been piloting a voluntary domestic emissions trading system for the energy and a number of industrial sectors since 2015 (the so-called 'Thailand VETS?'). Thailand's Climate Change Master Plan considers carbon markets as a potential mechanism to achieve targeted emission reductions in key industries and promote energy efficiency more widely^[20]. A regional carbon market for Asia Pacific has also been considered and Thailand has been sharing its experience in how carbon pricing measures directly contribute to its NDC. The upcoming PMI project will target MRV activities within NDC relevant sectors (energy and industry) and an overlap with the CBIT project can thus be excluded.</p>
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<p>Thailand Refrigeration and Air Conditioning (RAC) NAMA</p>	<p>2016 - 2021</p>	<p>NAMA Facility on behalf of BMU[21]^{21/} GIZ[22]²²</p>	<p>The RAC NAMA project aims to promote the widespread dissemination of green cooling technologies through financial mechanism and market support, technical assistance and policy support. The establishment of a proper Monitoring, Reporting and Verification (MRV) system for tracking emission reductions from use of green cooling technology is included in the project.</p>	<p>The RAC NAMA project targets MRV activities in an NDC and an NDC Roadmap relevant (energy efficiency & refrigerant replacement) and is thus not overlapping with the CBIT project with its focus on the non-NDC sector AFOLU.</p>
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Thailand Rice NAMA	2018-2023	NAMA Facility/GIZ	<p>The main goal of this project is to reduce greenhouse gas emissions ? mainly methane ? from irrigated rice cultivation in six focus provinces of the Central Plains. The mitigation potential is 1.664 million metric tons (Mt) of CO2 equivalents (CO2eq) which consider direct emissions of methane (CH4) resulting from flooding of rice fields, and nitrous oxide (N2O) related to fertilizer application, complemented by indirect CO2 emissions resulting from fertilizer production. Results so far include: 1. Built capacity of local and central government staff related to MRV for GHG emissions in the rice sector, 2. Developed implementation strategy and model for four basic mitigation technologies (Laser Land Levelling, Alternate Wetting and Drying, Site Specific Nutrient Management, Straw and Stubble Management) and Integrated Pest Management.</p>	<p>The Thai Rice NAMA project is related to the CBIT project as it targets the same sector. The mitigation measure ?Alternate wetting and drying? was originally considered for this CBIT project as one of five key measures in Component 2. As the Thai Rice NAMA already includes the same mitigation measure, it has been removed from the scope of the CBIT project to avoid overlaps. The CBIT project?s output 2.1 on institutional arrangements will complement the Rice NAMA which does not include a wider institutional component. The issue of open burning of agricultural residues which is addressed in the CBIT project?s component 2 is also related to rice production, as rice is one major crop, where fields are subject to open burning, together with sugarcane and corn[23]²³. While the Thai Rice NAMA does not specifically list open burning as a mitigation measure, one of the applied mitigation measures is ?straw and stubble management?, which provides an alternative to the burning of agricultural residues on rice fields.</p>
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<p>Accelerating Implementation of Thailand's Nationally Determined Contribution</p>	<p>2017-2018</p>	<p>GGGI^[24]²⁴</p>	<p>This project builds on earlier work by GGGI and develops an NDC Action Plan for the industrial sector and provides training to strengthen the capacity of key stakeholders to implement the NDC Action Plan. The project further develops proposals for two bankable projects aligned to the NDC Action Plan and for submission to potential funders.</p>	<p>GGGI's project provides support to mitigation within an NDC relevant sector and thus complements the CBIT project which focuses on a mitigation action outside Thailand's NDC.</p>
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TRANSfer	Since 2017	GIZ	<p>The project supports the Office of Transport and Traffic Policy and Planning (to develop ambitious mitigation actions in the road transport sector in Bangkok and secondary cities in Thailand through the development of a National Urban Mobility Investment Programme</p> <p>In its activities, GIZ actively supports the development of the NDC action plan for the transport sector and offers training courses for government officials to improve their transport related MRV skills.</p>	<p>GIZ's project provides support to mitigation within an NDC relevant sector and thus complements the CBIT project which focuses on a mitigation action outside Thailand's NDC.</p>
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Thailand Greenhouse Gas Emissions Inventory System (TGEIS)	2017 - 2018 (Phase 1), 2019 - 2020 (Phase 2)	Government of Australia	<p>This project supported ONEP in the development of Thailand Greenhouse Gas Emissions Inventory System (TGEIS), similar to the Australian Greenhouse Emissions Information System (AGEIS). The TGEIS is IT based data system for developing GHG inventories and automating data entry and data quality check. Data entry templates were developed for the different sectors (Energy, Transport, IPPU, Agriculture, LULUCF, Waste, Other) as well as user guidelines. The TGEIS is operated by the ONEP team, which is responsible for preparing the GHG Inventory. Phase II (starting 2019) focuses on trial running the system and resolving system bugs, as well as training ONEP staff in using the TGEIS.</p>	<p>The TGEIS provided the technical GHG database and related data entry templates for the different sectors in Thailand. While this is a key step towards future GHG inventory preparation, the TGEIS project did not include any institutional component. The CBIT project will address this gap through its Component 1 by strengthening institutional arrangements within the AFOLU sector, from which it can be expanded to other sectors. The TGEIS project did also not address the data collection from the different agencies. While the data entry templates harmonize the reporting of information, it does not address the collection of GHG data in the related agencies. The CBIT project addresses this through its output 1.2, the development of sectorial guidelines, templates and tools within the AFOLU sector to be expanded to other sectors. Lastly, while the TGEIS includes QA/QC elements, where the sectoral lead agencies conduct QC and another sectoral expert conducts QA, the CBIT will substantially advance QA/QC procedures in the Forestry sector, building on the existing TGEIS QA/QC elements where the Department of National Parks, Wildlife and Plant Conservation (DNP) fulfills the QC</p>
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Thai-German Climate Programme (TGCP)	2018-2021	IKI ^[25] ²⁵ / GIZ	<p>Energy component: The project supports selected Provincial Energy Offices (PEOs) in creating effective and long-term energy planning processes and project implementation through using innovative digital tools for effective provincial energy planning and implementation.</p>	<p>One of the main objectives of the TGCP is the establishment of an improved MRV system in accordance with the UNFCCC requirements as well as the support of institutional structures for mobilising funds for NDC implementation. The TGCP's MRV support includes, among other, the development of quality control (QC) templates for different sectors. QC templates will be first developed for the energy and waste sector as they already have a clear MRV system^[26], followed by the transport, IPPU and agriculture sector. The CBIT project clearly complements TGCP's activities by providing QA/QC support in the forestry sector, which is not covered by TGCP.</p>
			<p>Agriculture component: The project supports the Thai rice sector in the process of developing and implementing a new strategy for appropriate mitigation and adaptation actions. It helps to establish a national framework for a database system (MRV system) to account for GHG emissions. The project also supports creating incentives for Thai farmers and other stakeholders of the rice value chain to change their current practices towards low-emission methods in rice production. This project component will also cooperate with the Thai Rice NAMA project.</p>	<p>TGCP's agriculture component will support the development of an MRV system for the rice sector by mobilizing inter-institutional cooperation among relevant government agencies. While the TGCP only focuses on the rice sector and specifically works with the, the CBIT project goes further in providing institutional arrangements for the whole of the AFOLU sector. As the TGCP Agriculture project will collaborate with the Thai Rice NAMA, collaboration with this component is</p>
			<p>Waste component: The project supports the implementation of the NDCs in the municipal waste</p>	

NDC Partnership	Since 2020	NDC Partner-ship	Thailand is since the beginning of 2020 member of the NDC partnership though which it can request support for the implementation of its NDC, among other, through NDC Partnership Plans. Member countries of the NDC Partnership can further access NDC support through the Climate Action Enhancement Package through which 63 countries are already being supported.	NDC Partnership's work through its Partnership Plans focuses on the implementation of NDC's in countries. The CBIT project focuses on the AFOLU sector which is not included in the mitigation component of Thailand's NDC. However, a number of existing Partnership Plans also cover adaptation actions and they often also include elements of institutional coordination. At the time of this proposal, no information exists on a Partnership Plan for Thailand.
ADAPTATION				

<p>Risk-based National Adaptation Plan (Risk-NAP)</p>	<p>2015-2020</p>	<p>IKI/GIZ</p>	<p>This project supported the development of a national Climate Change Risk Assessment (CCRA) and the National Adaptation Plan (NAP) taking account of the results from CCRA. For adaptation mainstreaming at the national level, the Risk-NAP project focused on three sectors, namely health, tourism and human settlements. Another objective of the project was the integration of climate risks and NAP measures into sector policies/strategies and subnational planning processes as well as the setting up of a monitoring and evaluation system.</p>	<p>The three sectors of this Risk-NAP project do not include the Agriculture sector which is covered by Component 4 of the CBIT project which will also complement the monitoring and evaluation system, developed under the Risk-NAP through expansion to the Agriculture sector.</p>
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<p>Advancing Co-Design of Integrated Strategies with Adaptation to Climate Change in Thailand (ADAP-T)</p>	<p>2016-2021</p>	<p>JICA[27]²⁷</p>	<p>The ADAP-T Project is a technical cooperation project which Kasetsart University is continuing from its preceding project called Integrated Study Project on Hydro-Meteorological Prediction and Adaptation to Climate Change in Thailand (IMPAC-T). The project's output are: 1. To establish a knowledge base for climate change (database); 2. To identify appropriate adaptation measures for coastal, forestry, water, urban, rural, and sediment sectors; and, 3. to co-design adaptation options for the Thai government to utilize for climate change response.</p>	<p>The ADAPT-T project focuses on adaptation measures within coastal, forestry, water, urban, rural, and sediment sectors. The Component 4 of the CBIT project focuses on agriculture only and related monitoring and evaluation system. The CBIT project is thus complimentary to this project. Common between the two projects is the collaboration with the Kasetsart University.</p>
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<p>Integrating Agriculture in National Adaptation Plans (NAP-Ag)</p>	<p>2016-2018</p>	<p>FAO/ UNDP</p>	<p>The project activities included updating the Agriculture Strategic Plan on Climate Change (ASPCC), including adaptation action plans; strengthening performance-based monitoring and economic assessments of adaptation actions; building institutional capacity to understand climate change risk and vulnerabilities in the sector and integrate this into project design; and contributing to the overall Thailand NAP process, generating lessons and evidence from NAP-Ag activities at federal and sub-national level to realign planning and budgeting processes. Achievements include among other, the establishment of an Inter-departmental working group under MoAC, sector-specific vulnerability and risk assessments at national and subnational levels, and the provision of training at provincial levels on log-frame preparation and monitoring of adaptation projects.</p>	<p>The NAP-Ag supported the Office of Agricultural Economics in strengthening sector M&E processes for adaptation. Equally, it is stated that M&E or adaptation actions ?remains a challenge for the successful implementation of the ASPCC?[28]²⁸. The CBIT project will advance M&E activities and overall tracking of adaptation within Agriculture through its component 4.</p> <p>A NAP-Ag roadmap document is currently being prepared. The document will guide continued sectoral adaptation planning and the implementation of ASPCC and agriculture sector components of Thailand's NAP. The CBIT will complement and further these efforts with the three outputs of the component 4, including templates for a national information gateway.</p>
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Table 5. Projects with a focus on capacity building with international support

Project Name	Project Period	Donors/ Agency	Description of Support	Linkages to the CBIT Project
MITIGATION				
Initiative for Climate Action Transparency (ICAT)	2019	UNOPS[29] ^{29/} UNEP DTU Partnership	This project aimed to strengthen MRV system for Thailand's climate change mitigation, especially in the areas of industry and buildings. Ultimately, the focus of the two areas will lead to effective contribution to Thailand's NDC implementation.	The ICAT project provided recommendations for MRV within the Industry and Buildings sector which are included in Thailand's NDC. As the CBIT project targets MRV within Agriculture, its activities are complimentary to the ICAT project.
ADAPTATION				

Strengthening Good Governance and Democratic Process in National Climate Change Adaptation Planning	2016-2020	EU[30] ³⁰ /G SEI[31] ³¹	Promoting the role of environmental civil society organizations (CSOs) to ensure good governance in national climate change adaptation planning: activities include community-based training, awareness raising, and adaptation plans. Other expected results are case study sites demonstrating adaptation measures and strengthened network of environmental CSO's and Local Authorities demonstrated through policy recommendations and advocacy strategies targeting national climate change adaptation planning.	The CBIT project through its output 4.2 on templates for a national information gateway on climate risk, vulnerability and adaptation will also benefit adaptation activities implemented by local authorities and civil society organization.
Climate Change International Technical and Training Center (CITC)	2018-2020	JICA	The CITC through the Thailand Greenhouse Gas Management Organization (TGO) provides capacity building to key officials related to low carbon development challenges affecting the whole ASEAN region, including climate finance training program for municipalities, including training of trainers. The CITC also cooperates with the Vietnam's Department of Climate Change for capacity building on GHG inventory, mitigation, MRV and climate finance.	The work of the CITC is limited to the provision of training to individuals while the CBIT project goes far beyond that in strengthening institutional arrangements, improving data collection, among other, in Thailand's AFOLU sector. As such, the CBIT project will strengthen overall institutional capacities, going beyond individual capacities. The CITC work does not cover adaptation as opposed to the CBIT project.
CROSS-CUTTING ISSUES				

<p>Strengthening Thailand's Capacity to Link Climate Policy and Public Finance</p>	<p>2013-2017</p>	<p>SIDA[32]^{32/} UNDP</p>	<p>The project aimed to support Thailand in strengthening its institutional capacity to link a coordinated and coherent green growth and climate change policy with its budgetary allocations and to report and measure over time the effectiveness of those policies and expenditures. The focus of project is to track national budget allocation to address climate change.</p>	<p>Through the UNDP project, private climate expenditures will be assessed. The CBIT project's Component 3 complements this through tracking international support received for climate action and will thus provide a different element of transparency of climate finance in the country.</p>
<p>Climate Change Benefits Analysis (Subproject of Strengthening Thailand's Capacity to Link Climate Policy and Public Finance)</p>	<p>2013-2017</p>	<p>SIDA/ UNDP</p>	<p>In this project, Climate Change Benefits Analysis (CCBA) guidelines were developed a tool for climate screening and investment appraisal. The guidelines support line Ministries and budget agencies/finance ministries to develop and monitor public investment projects in a more climate-responsive approach.</p>	<p>The CCBA method was first piloted in the development of budget proposals in the agriculture sector through the Ministry of Agriculture and Cooperatives and its Royal Irrigation Department. As part of a CCBA, climate change risks that may occur in the future are analyzed. The CBIT project through its national information gateway on climate risk, vulnerability and adaptation in the agriculture sector will support future CCBAs.</p>

Delivering Sustainability through Climate Finance Actions in Thailand (NDC Support Programme)	2019-2021	UNDP	The project will initiate Thailand's Climate Change Financing Framework (CCFF) and support the formulation of an inclusive, gender-responsive public budgeting process on climate change, the assessment of public incentives in stimulating investment to reduce emissions, and foster cooperation between public and private sectors for long-term relationship for future infrastructure investments.	UNDP's NDC Support programme will support the development of Thailand's Climate Change Financing Framework which includes, among other, the development of a climate budget tagging system enabling real-time climate expenditure reports. This project complements Outcome 3 of the CBIT project as well as ONEP's recently developed system for tracking international support received.
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As seen in the tables 4 and 5 above, several projects with different thematic focus have provided or are providing support for the development of Thailand's transparency/MRV system and related institutional arrangements. GIZ in particular, Germany's development agency, is a large support provider through its Thai German Climate Programme (TGCP) and has been supporting Thailand within the area of climate change policy for a number of years. Furthermore, the establishment of the Thailand Greenhouse Gas Emission Inventory System (TGEIS), through the support by the Australian Government, has been a major milestone towards Thailand's compliance with the future BTR requirements, notably to present a national greenhouse gas inventory report on a biennial basis. However, data collection in the different sectors through sectoral agencies remains a precondition for accurate and comprehensive GHG inventories. The CBIT project will complement the TGEIS database system with enhancing institutional arrangements, data collection efforts, increasing the accuracy through the development of country-specific emission factors, among other. While CBIT's work will mainly focus on the AFOLU sector, it will provide the transparency basis for expansion into other sectors. Furthermore, CBIT targets support within transparency of mitigation within agriculture, which is not covered by Thailand's NDC and its related roadmap. The NDC sectors, namely Energy & Transport, Waste and IPPU, are covered through activities by GIZ, GGGI and possibly through the NDC Partnership. Although the CBIT project does not contribute directly to the mitigation component of Thailand's existing NDC, it will provide the basis for its next NDC, as the Thai government is exploring the inclusion of mitigation actions in the Agriculture sector for its second NDC due in 2025.

Efforts to strengthen adaptation in Thailand have also been underway, mostly through the NAP process and sector specific adaptation projects. The NAP-Ag, implemented through UNDP and FAO, is particularly relevant for this CBIT project and laid the groundwork for adaptation in the agriculture sector. However, one of the lessons learned of the NAP-Ag project is that "there is a distinct need for

effective systems for M&E that are able to complement existing monitoring systems at the sector level[33]³³?. The NAP-Ag specifically developed options that strengthen M&E processes linked to the Thailand's Agriculture Strategy on Climate Change and expanded the knowledge base for sector adaptation planning. Furthermore, the expansion of the existing climate change knowledge base on agriculture and adaptation options through risk and vulnerability assessments is seen as critical. The CBIT project will thus provide a continuation and a timely response to the outcomes of the NAP-Ag project through the activities in component 4.

Thailand has also received support in advancing transparency of climate finance, mostly provided by UNDP's earlier climate budget tagging exercises (CPEIR & PCEIR) and through UNDP's current project on developing a Climate Change Financing Framework including tagging national climate budgets. The CBIT project complement's UNDP's activities by focusing on tracking of climate finance received/needed from international donors by advancing ONEP's existing system on tracking support received/needed.

Conscious of the past and ongoing transparency activities in the different sectors and in the areas of GHG inventory, mitigation, adaptation and climate finance, this CBIT project will specifically target the AFOLU/Agriculture sector and specific sub-activities, which are of high importance in the Thai context, among other, the open burning of biomass. A number of organizations, notably the GIZ and UNDP, already provide transparency-related support to Thailand; this CBIT project will thus complement these activities with a view to both avoid overlaps and create synergies.

Assessment of barriers, gaps and needs for Thailand to comply with the requirements of the ETF

Although Thailand has made significant progress in enhancing its arrangements for the preparation of GHG inventories through the various capacity building projects mentioned above, a number of gaps remain to be addressed before Thailand can successfully comply with the ETF framework of the Paris Agreement. Under the BUR and NC processes, Thailand identified a number of barriers and needs with regard to the quality of its GHG inventories and data collection procedures, especially in the AFOLU sector.

Thailand also underwent a technical analysis process following the submission of both the first and second BURs. The Technical Team of Experts (TTE) identified 12 capacity building needs with regard to reporting to the UNFCCC and Thailand identified priority capacity building needs. The TTE also

noted that the transparency of reporting could be increased by including information on underlying assumptions and description of domestic MRV arrangements for mitigation actions outside the scope of the NAMA roadmap. Regarding the reporting on institutional arrangements, the TTE pointed out that the transparency could have been improved if Thailand had included a description of roles of the different entities, mechanisms for information and data exchange as well as QA/QC procedures. Under the ICA process for the SBUR, Thailand has received a number of comments from the technical analysis, including questions on how country-specific emission factors for agriculture have been developed and whether the institutional arrangements of the FBUR process are still valid.

Further gaps identified during the BUR and NC process as well as presented in documents and in regional fora^[34],^[35] are listed below:

Arrangements for Data Collection and Reporting in the AFOLU sector

? A significant barrier in the GHG inventory process is the lack of mandates of agencies involved in the GHG inventory compilation to collect and provide data in a comparable and consistent manner. Various agencies are involved in data collection within the AFOLU sector. In addition, the collection of data from the private sector, for instance with regard to wood harvested, is currently cumbersome and needs to be enhanced through data collection agreements. This also applies to data collection from local governments. Lessons learned from Thailand's NAMAs also showed that access to sectoral data (e.g. from Forestry) can be difficult and that there is a need for clear institutional mandates for relevant agencies for data input for ex-ante assessment as well as data collection overall. Overall, there is a need to identify and implement the necessary legal and formal arrangements for data collection and reporting. The TNC also points out the need for stable permanent institutional arrangements in general for effective planning and implementing of climate change strategies.

? This will be addressed for the AFOLU sector through Output 1.1 (and Output 2.1).

? In its TNC, Thailand determined the need of developing and implementing a national GHG data management system, including the necessary procedures and plans, for tracking and archiving inventory information of each inventory period. For documentation and archiving, the need for capacity building is pointed out.

? This gap has already been addressed through the establishment of the Thailand Greenhouse Gas Emissions Inventory System (TGEIS), with support of the Australian Government

•Reporting of activity data in AFOLU from multiple agencies, needs to be unified through standardized templates and guidelines. For example, each agency involved in data collection for the LULUCF sector, such as the Royal Forest Department and the Forest Industry Organization, is currently using different methodologies and formats for data collection, which prevents a harmonization and comparison of submitted data. This relates specifically to the lack of a standardized land use map as currently the different agencies in the sector develop their own land use map and collect data for their own purposes with different scales, land classification and resolution, among other, as the data was collected for other purposes. Standardized reporting templates for activity data and a standardized land use map will support streamlining data collection processes as well as enhancing data consistency and comparability.

? This will be addressed for the AFOLU sector through Output 1.2.

? In addition, targeted training of national experts is required to address the barrier of limited technical expertise in the country for the development and implementation of climate change policies. The need for training and technical assistance on quality control and quality assurance, documentation and archiving are also recognized. The need for capacity-building is also pointed in relation to shifting from Land use, Land use change and forestry (LULUCF) to AFOLU reporting.

? This will be partially addressed for the AFOLU sector through Output 1.2 complimenting the efforts of other support projects as mentioned in table above.

GHG Inventory Quality

? For the estimation of Thailand's GHG emissions as part of its BUR and NC processes, the 1996 Revised IPCC Guidelines for National Greenhouse Gas Inventories had been previously used. Through the TGEIS, the country has adopted the 2006 IPCC Guidelines for estimating the emissions in the third BUR and subsequent GHG reporting documents. This early approach followed by Thailand will lay a solid foundation for submitting by 2024 a first biennial transparency report (BTR) and national inventory report (NIR), if submitted as a stand-alone report, in accordance with the Modalities, procedures and guidelines or MPGs. However, to keep improving the GHG inventory quality, a thorough use of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for estimating GHG emissions of all sectors is crucial. In the facilitative sharing of views under the ICA process, Thailand identified the challenge of using the most updated IPCC Guidelines due to lack of activity data and time constraints to follow the new requirements posed by these guidelines. A transition also

requires a substantial strengthening of professional capacities of technical staff involved in the inventory process. As identified in the TNC, capacity building and enhancement of local experts in the GHG inventory is necessary. In the LULUCF sector, Thailand faces the challenge of producing a time-series land-cover map following the IPCC guidelines as stated in the Volume 4-Chapter 3 of the 2006 IPCC Guidelines. Similar maps have already been produced by different agencies but are inconsistent and not comparable, due to the use of different technical specifications. This is a clear example showing the relevance of incorporating effective coordination mechanisms into the institutional arrangements at Government level, optimizing the use of scarce resources.

? This will be addressed for the AFOLU sector through Output 1.1.

? Although Thailand has already applied country-specific emission factors (EF) for a few sub-sectors, such as enteric fermentation (cattle and buffalo) and rice cultivation, IPCC default emission factors are used for the majority of the AFOLU sub-sectors. The TNC specifically identifies the need to develop country-specific emission factors for the main fuels used in Thailand including biofuels. The team of technical experts (TTE) of the ICA process for Thailand's first BUR, also identified the need to develop country-specific emission factors in various areas, including livestock and agricultural soils within the agriculture sector. In the light of new data and methodologies, existing country-specific emission factors require updating with a view to enhance data accuracy.

? This will be addressed for activities in the AFOLU and Energy sectors through Output 1.2.

? In addition to enhancing and developing local emission factors, there is a strong need to advance the quality of activity data in most sectors. Thailand experiences difficulties in transitioning to higher tier methodologies due to lack of research support. More accurate activity data for sub-sectors in the Agriculture, LULUCF and Waste sectors are also pointed out. Improvement of activity data is in particular important for the Agriculture and LULUCF sectors, as Thailand is planning to include this sector in its next NDC submission with a view to enhance the country's ambition.

? This will be addressed for the AFOLU sector through the Outputs 1.1, 1.2 and 2.3. Support to the waste sector is already provided through the Waste component of the Thai German Climate Programme.

? The need for the development and implementation of a Quality Assurance and Quality Control (QA/QC) system as well as an enhanced process for uncertainty analysis have been identified in Thailand's TNC process. Guidelines for quality control for the data collection process by line ministries are needed as well as for guidelines for lead agencies of the different sectors on how to assess the quality of data collected by their line ministries, As pointed out in the MPG's Decision 18/CMA.1 (Chapter II. National inventory report of anthropogenic emissions by sources and removals by sinks of

greenhouse gases, Section B. National circumstances and institutional arrangements) each party shall report on a variety of functions related to inventory planning, preparation and management on documentation about generating and aggregating data, including quality assurance/quality control (QA/QC). Following MPG's advice, this can be performed following the guidelines presented by the IPCC in its 2006 IPCC Guidelines for National Greenhouse Gas Inventories in its Volume 1 (General Guidance and Reporting) complemented with previous guidance provided by the IPCC on QA/ QC procedures and uncertainty analysis. This needs to be especially strengthened within the Agriculture and LULUCF sectors, adapting the guidelines presented in Volume 4 (Agriculture, Forestry and Other Land Use) of the 2006 IPCC Guidelines whereby sectorial advice targeted to Agriculture and LULUCF sectors of the Inventory is presented.

? This will be addressed for the Forestry sector through Output 1.4. Quality control templates in other sectors (Energy, Waste, IPPU and Agriculture) will be developed by GIZ's Thai German Climate Programme.

Monitoring and Evaluation of Adaptation Actions

? Standardized reporting templates are equally needed for improving data collection processes on vulnerability and adaptation from sectors prioritized in the Climate Change Master Plan. The standardization of the various sources of data on vulnerability and adaptation has been highlighted as a need and barrier throughout the NAP process, and specifically of importance in the Agriculture areas. Especially, the monitoring and evaluation of adaptation actions remain a challenge for the implementation of the Thailand's Agriculture Strategic Plan on Climate Change (ASPCC). The involvement of subnational and local authorities is crucial for an effective tracking of adaptation goals, which requires adjustment of existing metrics, indicators and methodologies to the subnational level.

? This will be addressed for the Agriculture sector through the Outputs 4.1, 4.2. and 4.3.

? Regarding adaptation aspects, from the six adaptation sectors identified earlier in this document, the Government of Thailand is in the process of pursuing appropriate M&E indicator and procedures to each of these adaptation components. Agriculture are most in need of specific development and deployment of metrics and indicators. Quantitative M&E may have to be complemented with qualitative and consultation approaches conducive to stakeholder engagement and participation.

? This will be addressed for the Agriculture sector through Output 4.1 and 4.2.

Tracking of Mitigation Actions

? Under the NAMA process, it became clear that capacity building for MRV is needed in all sectors. The TNC also identified the need for technical trainings for systematic data collection, including techniques for data gap filling. Capacity building on data collection processes and quality check is required for line agencies which collect and compile activity data within the NAMA and NDC sectors and especially within the related sub-sectors. As identified in the TNC process, Thailand is lacking relevant methodologies and tools, and related human capacities, for tracking progress of mitigation actions outlined in its NAMAs and NDC Roadmap. Under the ICA process, Thailand also stated that strengthening national capacity for the development of assumptions for all mitigation actions is a priority capacity building need.

? This will not be addressed through the CBIT project but is covered by GIZ's support activities. Instead, the CBIT project (Outputs 2.1, 2.2 and 2.3) will focus on MRV of mitigation actions within Agriculture, which is not included in the NDC. Few activities under the Thai Rice NAMA are related to the CBIT support in Output 2.2 and 2.3.

MRV of Support Received and Climate Expenditures

? Another barrier which has been identified in the TNC relates to the transparency of climate finance and specifically on how to enhance the accountability of institutions dealing with climate finance. A system is required to monitor the use of climate finance and support, and to manage the allocation of domestic financial resources.

? This will be addressed through the Outputs 3.1 and 3.2, complementing the activities by UNDP's project on developing the Thailand Climate Change Financing Framework.

Despite the large number of projects that have supported Thailand in advancing its transparency capacities in different areas and sectors, several barriers and gaps remain to be addressed. While Thailand's transparency capacities in the energy are relatively advanced, also due to support from many projects, particular challenges remain in the AFOLU sector, which requires specific technical capacities and data. In line with this barrier and in consultation with ONEP, the focus of the CBIT project will be on the AFOLU sector and will address a variety of gaps within the sector and sub-sectors. The exact activities of the CBIT project are outlined in following section.

3) Proposed alternative scenario with a description of project components, outcomes, outputs and activity/deliverables

The objective of the project is to enable Thailand having the necessary capacities and institutional arrangements to comply with the requirements of the Enhanced Transparency Framework, specifically the information to be reported by Thailand in its first BTR. This CBIT project includes activities related to the four elements of a Biennial Transparency Report as laid out in the Modalities, Procedures and Guidelines of the Enhanced Transparency Framework: a national inventory report, the tracking of progress in NDC implementation and achievement as well as information related to climate change impacts and adaptation and information on supported needed and received.

While the CBIT project will advance Thailand's transparency capacities in general, the outputs of the project are also linked to specific requirements/ recommendations by the MPGs (see Table 6). Although Outcome 2 of the project targets a sector (Agriculture) which is not covered by the mitigation component of Thailand's NDC, namely Agriculture, Thailand explores the option of including mitigation actions from the Agriculture sector in its second NDC due by 2025. As such, activities under Outcome 2 of the project, including institutional arrangements and indicators to track progress, provide the basis for the inclusion of Agriculture in Thailand's future NDC. The link of the CBIT project's Outcome 2 information to the BTR element on tracking progress in NDC is therefore provided in grey. While a national GHG inventory and tracking of NDC actions are mandatory reporting elements in the Biennial Transparency Reports (Outcome 1 & 2); information related to support received (Outcome 3) and climate change impacts and adaptation (Outcome 4) are voluntary reporting requirements. Despite their voluntary nature, reporting on these elements will provide a better understanding of support received and adaptation in a national context, raise the salience of these topics in an international context and will provide input into the Global Stock Take process.

Table 6. Comparison of BTR elements and MPG requirements/recommendations to the elements of Thailand's CBIT Project

BTR Elements	Thailand CBIT Project Elements		Specific MPG requirements/recommendations
I. National inventory report of anthropogenic emissions by sources and removals by sinks of	O U T	Output: 1.1	Each Party should implement and maintain <u>national inventory arrangements</u> , including institutional, legal and procedural arrangements for the continued estimation, compilation and timely reporting of national inventory reports in accordance with these MPGs. (II, section B, para 18, p. 22)

greenhouse gases <i>Mandatory</i>	C O M E 1	Output 1.2	<p>Each Party shall use methods from the IPCC guidelines referred to in paragraph 20 above. Each Party should make every effort to use a recommended method (tier level) for key categories in accordance with those IPCC guidelines.</p> <p>(II, section C, para 21, p. 23)</p> <p>Each Party is encouraged to use <u>country-specific and regional emission factors and activity data</u>, where available, or to propose plans to develop them, in accordance with the good practice elaborated in the IPCC guidelines referred to in paragraph 20 above.</p> <p>(II, section C, para 24, p. 23)</p>
		Output 1.3 (Agriculture and Energy)	<p>Each Party is encouraged to use country-specific and regional emission factors and activity data, where available, or to propose plans to develop them, in accordance with the good practice elaborated in the IPCC guidelines referred to in paragraph 20 above.</p> <p>(II, section C, para 24, p. 23)</p>
		Output 1.4	<p>Each Party shall elaborate an inventory QA/QC plan in accordance with the IPCC guidelines referred to in paragraph 20 above [?].</p> <p>(II, section C, para 34, p. 24)</p>
II. Information necessary to track progress in implementing and achieving NDCs <i>Mandatory</i>	O U T C O M E 2	Output 2.1	<p>Each Party shall provide information on the institutional arrangements in place to track progress made in implementing and achieving its NDC under Article 4, including those used for tracking internationally transferred mitigation outcomes, if applicable, along with any changes in institutional arrangements since its most recent biennial transparency report.</p> <p>(III, section A, para 61, p. 27)</p> <p>Each Party shall provide information on legal, institutional, administrative and procedural arrangements for domestic implementation, monitoring, reporting, archiving of information and stakeholder engagement related to the implementation and achievement of its NDC under Article 4.4</p> <p>(III, section A, para 62, p. 28)</p>

		Output 2.2	<p>Each Party shall identify the indicator(s) that it has selected to track progress towards the implementation and achievement of its NDC under Article 4. Indicators shall be relevant to a Party's NDC under Article 4 and may be either qualitative or quantitative.</p> <p>(III, section C, para 65, p. 28)</p>
		Output 2.3	<p>Each Party shall provide a description of each methodology and/or accounting approach used, as applicable for: (a) Key parameters, assumptions, definitions, data sources and models used; (b) IPCC guidelines used; (c) Metrics used; (d) Where applicable to its NDC, any sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, including as applicable:</p> <p>(III, section C, para 74, p. 29)</p>
<p>III. Information related to climate change impacts and adaptation</p> <p><i>Voluntary</i></p>	<p>O U T C O M E 4</p>	Output 4.1	<p>Each Party should provide the following information, as appropriate, related to monitoring and evaluation: (c) Assessment of and indicators for, (i) how adaptation increased resilience and reduced impacts; (i) Transparency of planning and implementation;</p> <p>(IV, section F, para 112, p. 35)</p>
		Output 4.2	<p>In order to enhance their adaptation actions and to facilitate reporting, as appropriate, each Party should report on the establishment or use of domestic systems to monitor and evaluate the implementation of adaptation actions. Parties should report on approaches and <u>systems for monitoring and evaluation</u>, including those in place or under development.</p> <p>(IV, section F, para 112, p. 35)</p>
		Output 4.3	<p>Each Party should provide the following information, as appropriate:</p> <p>(f) Efforts to integrate climate change into development efforts, plans, policies and programming, including related capacity-building activities;</p> <p>(IV, section D, para 109, p. 34)</p> <p>Each Party should provide the following information, as appropriate, related to cooperation, good practices, experience and lessons learned: (iii) Monitoring and evaluation.</p> <p>(IV, section H, para 116, p. 36)</p>

IV. Information on financial, technology development and transfer and capacity- building support needed and received <i>Voluntary</i>	O U T C O	Output 3.1 (support received only)	Developing country Parties should provide information on national circumstances and <u>institutional arrangements</u> relevant to reporting on support needed and received, including: (a) A description of the systems and processes used to identify, track and report support needed and received, including a description of the challenges and limitations; (VI., section A, para 130, p. 41)
	M E 3	Output 3.2 (support received only)	Developing country Parties should provide, in a common tabular format, information on financial support received, including, to the extent possible, and as available and as applicable: (a) Title (of activity, programme or project); (b) Programme/project description; (c) Channel; (d) Recipient entity; (e) Implementing entity; (f) Amount received (in domestic currency and in United States dollars); (g) Time frame; (h) Financial instrument (grant, concessional loan, non-concessional loan, equity, guarantee or other); (i) Status (committed or received); (j) Sector and subsector; (k) Type of support (mitigation, adaptation or cross-cutting); (l) Whether the activity has contributed to technology development and transfer and/or capacity-building; (m) Status of activity (planned, ongoing or completed); (n) Use, impact and estimated results.

The CBIT project focuses specifically on the Agriculture, Forestry and Other Land Use sector, as a priority sector in Thailand with as of yet insufficient transparency capacities and systems. In contrast to the AFOLU sector, Thailand's capacities in the Energy and IPPU sectors are more advanced, which is also grounded in the often more technical and complex nature of the sector.

While the AFOLU sector is not included in the mitigation component in Thailand's initial NDC, the adaptation component lists prioritized adaptation efforts within agriculture, such as the promotion of sustainable agriculture and forestry, including the increase of national forest cover to 40%. However, in Thailand's Third National Communication several Agriculture mitigation measures "beyond Thailand's NAMA and NDC Roadmap" are listed, including "alternate wetting and drying in paddy rice fields" and "avoiding burning of crop residues. The AFOLU sector is also included in a number of relevant climate change policies, including Thailand's Climate Change Plan and the Agriculture Strategic Plan on Climate Change (ASPCC) 2017-2021. The ASPCC comprises four strategies: 1. Database, knowledge and technology, 2. Adaptation actions, 3. Mitigation actions and 4. Driving mechanism which covers general strengthening of capacities.

In line with national climate change policies, the CBIT project aims to enhance Thailand's national institutions for transparency-related activities and formalize institutional arrangements in alignment

with national priorities, including the development of data-sharing agreements to be adopted by the government, with a focus on AFOLU sector. Specifically, the CBIT project is targeted towards institutional capacities, specifically focusing on developing capacities in institutions and providing relevant tools, guidelines, templates, databases and procedures, and building and enhancing adequate technical and institutional capacities to meet the provisions of the enhanced transparency framework. Taking account already available tools and databases, notably the Greenhouse Gas Emissions Inventory System (TGEIS) and, this CBIT project will build on existing structures and systems in advancing Thailand's transparency capacities in the areas of GHG inventory, tracking of mitigation actions and support received, as well as monitoring and evaluation of adaptation actions.

This will be complemented by a strong emphasis on the sustainability of the transparency work, identifying existing institutions to acquire full capacities in the required areas and subsequently providing training modules and capacity building activities for existing and specifically for new staff, hereby addressing the problem of staff turnover in the institutions. This approach will improve the overall data quality and data management procedures for the preparation of GHG inventories and for improving adherence to the principles of transparency, accuracy, completeness, consistency and comparability (TACCC), as stated as one of aims in Thailand's TNC.

In order to address the multitude of remaining gaps, barriers and needs as mentioned above, this project has been structured in four components geared towards achieving four corresponding key outcomes, in turn comprising several related outputs. The outputs for each of the components have been thoroughly discussed among relevant stakeholders and involved agencies to allow for broader feedback and stronger buy-in for the development of the transparency system. This will both help raising awareness among stakeholders about the importance of transparency, as well as increasing the acceptance of the transparency system and its sustainability over time.

Thus, the CBIT project, in combination with complementary and concurrent projects and technical assistance, will contribute to addressing the existing identified gaps and barriers before the first BTR. Specifically, on the BTR element of the National Inventory, Thailand faces barriers and gaps in order to fulfil the relevant requirements and recommendations, including:

- National inventory arrangements ? barriers and gaps identified include unclear description of roles of the different entities, mechanisms for information and data exchange as well as QA/QC procedures; lack of mandates of agencies involved in the GHG inventory compilation to collect and provide data in a comparable and consistent manner. CBIT Thailand's Output 1.1 will contribute to clearer roles through the creation of a working group for the development of satellite image translation models, as well as a working group and responsible focal point for Output 2.1 focused on open burning reduction. Activity data from Output 1.1, as well as a clear QA/QC model for forest sector activity data

acquisition from satellite imagery translation will result in a more systematic and continuous preparation of data.

- Use of methods from the IPCC guidelines, specifically recommended tier level? barriers and gaps identified include the need of additional technical capacity for a consistent use of methodologies, and the recent establishment of the Thailand Greenhouse Gas Emissions Inventory System (TGEIS), with support of the Australian Government, along with the capacity building associated to the TGEIS operation will improve the quality of analysis, with CBIT Thailand's Output 1.1 further addressing this barrier for the AFOLU sector. The need to transition to higher tier methodologies will be addressed for the AFOLU sector through the Outputs 1.1, 1.2 and 2.3. Support to the waste sector is already provided through the Waste component of the Thai German Climate Programme.

- Use of country-specific and regional emission factors and activity data? barriers and gaps identified include the need to unify reporting of activity data in AFOLU from multiple agencies, through standardized templates and guidelines. CBIT Thailand's Output 1.2. will contribute to closing this gap by developing EFs in the energy sector, which will upgrade the tier to be country-specific values leading to higher level of accuracy of the national inventory

- Elaboration of inventory QA/QC plan? barriers and gaps identified include the need for training and increased technical capacity on quality control and quality assurance, documentation and archiving, particularly in relation to shifting from Land use, Land use change and forestry (LULUCF) to AFOLU reporting. This will be partially addressed for the AFOLU sector through Outputs 1.2 and 1.4 complimenting the efforts of the development of quality control templates in other sectors (Energy, Waste, IPPU and Agriculture) through GIZ's Thai German Climate Programme. The CBIT project will not only assist in the development of QA/QC procedure of the Forestry Activity Data based on the QA/QC process developed by the GIZ, but also assist in enhancing the quality of the QA/QC for the data collection process and the techniques used in classifying the land use by satellite imagery. This will help ensure the quality throughout the QA/QC procedure since the start of data collecting process until the data reporting procedure. On the BTR element of information necessary to track progress in implementing and achieving NDCs, barriers and gaps exist for most MPG requirements, including institutional arrangements; legal, institutional, administrative and procedural arrangements; Indicators to track progress and methodologies and/or accounting approaches used. These barriers and gaps, explained in the relevant previous section, are mainly being addressed through GIZ's support, whereas CBIT Thailand will contribute to the readiness of progress tracking when Agriculture is included as an NDC sector.

On the BTR element of information on financial, technology development and transfer and capacity-building support needed and received, the main barriers towards the MPG voluntary requirements are the need to enhance the accountability of institutions dealing with climate finance. The enhancement of the existing system with ONEP via outputs 3.1 and 3.1 will contribute to addressing this gap. This will

complement the activities by UNDP's project on developing the Thailand Climate Change Financing Framework which will further contribute to addressing this gap by?

On the BTR element of information related to climate change impacts and adaptation barriers and gaps exist for most MPG voluntary recommendations, mainly on information related to monitoring and evaluation of impacts, planning and implementation; domestic systems to monitor and evaluate the implementation of adaptation actions; and the integration of climate change adaptation into development efforts, plans, policies and programming. These barriers include the standardization of the various sources of data on vulnerability and adaptation (particularly in the Agriculture sector), as well as the lack of involvement of subnational authorities in the tracking of adaptation. The development of metrics, indicators and methodologies for adaptation tracking (output 4.1) will provide a clear view of the needs to be addressed for adequate information generation, complemented by the standardization efforts of the information gateway (output 4.2) which will be developed first for the agriculture sector to serve as a template for other NAP sectors, and supported by specialized training (output 4.3) for integration of adaptation info policy formulation. Together, this will constitute a blueprint that can be followed by other key adaptation sectors to improve adaptation M&E towards a voluntary adaptation section of the BTR.

Component 1: Strengthening data collection processes and data quality for Greenhouse Gas inventory preparation

Outcome 1: Thailand has the institutional and human capacities to regularly prepare accurate and transparent GHG inventories through its national GHG inventory system of the Agriculture, Forestry and Other Land Use (AFOLU) Sector through its national GHG inventory system

The first outcome focuses on enhancing Thailand's institutional arrangements for the preparation of greenhouse gas inventories in the AFOLU sector. The implementation of component 1 will result in formalized institutional arrangements; processes and procedures for data collection and reporting; defined and clear roles and mandates of the different agencies involved in the GHG inventory process; sectorial guidelines, templates and tools; and country-specific emissions factors, as well as developing systems for data QA/QC in a key sector for GHG emissions. Through a comprehensive process of discussions with stakeholders, the government of Thailand has determined that focusing on the Agriculture, Forestry and Other Land Use (AFOLU) sector will have a stronger impact in terms of setting and testing a standard to follow up by the other sectors. The consultations are also focused on incorporating a gender-based approach so that these perspectives can be considered. Component 1 also includes the Energy sector in the activities related to the development of local emissions factors, since this was an area specifically identified as crucial in the stakeholder consultations.

The formalization of procedures and processes for data collection and reporting and the clear definition of roles and mandates of the different agencies in the AFOLU sectors will set an example of permanent institutional arrangements for transparency in the long term, prompting increased efforts in decision makers in other sectors, and improve interagency coordination in the AFOLU sector, promoting frequent communication among focal points and stakeholders, which is crucial for sharing information and streamlining processes.

The development of sectorial guidelines, templates and tools for data collection will enhance, harmonize and streamline the overall data collection processes from the multiple ministries and agencies involved in the AFOLU streams of the GHG inventory preparation, with a view to strengthen data flow, consistency and comparability. These guidelines and templates, complemented with a training provided to key staff in the different agencies, will support building in-house capacity over time and ease future GHG inventory preparation. An existing institution for the provision of training to staff, existing as well as new staff, will be identified in order to ensure the sustainability of those capacity building activities over time. These activities will also build on the Gender Action Plan for the project to be developed under Output 3.1.

The development of country-specific emission factors in key areas within the AFOLU sector and the Energy sector, considering national specific data and variables, will substantially enhance the quality and accuracy of GHG emission estimations and thus provide a more scientific base for decision-making. This will improve adherence to the 'TACCC' accounting principles, which Thailand aims to achieve for its future GHG inventories. The development of a QA/QC system for activity data for the Forestry sector will equally contribute to improving the accuracy of GHG emissions data, as also required by the Paris Agreement[36]³⁶.

Output 1.1 Institutional arrangements, including processes and procedures for data collection and reporting in the Agriculture, Forestry and other Land Use (AFOLU) sectors formalized

This output will formalize Thailand's institutional arrangements for transparency, including processes and procedures for GHG data collection and reporting of GHG emissions data in the Agriculture, Forestry and Land Use Change (AFOLU) sectors. As outlined in the barrier analysis above, the lack of mandates and roles of the various ministries and agencies involved in the GHG inventory process

currently impedes a streamlined and efficient data collection process. This is particularly relevant in the AFOLU sectors, where competencies are distributed across various offices and ministries.

The present GHG data collection process in the different sectors is done through sector-specific lead agencies, who compile the sectoral data and conduct a quality check before reporting the data to ONEP, who is in charge of preparing the overall GHG inventory through the use of the Thailand Greenhouse Gas Emissions Inventory System (TGEIS). GHG data collection from the AFOLU sector involves two separate data collection streams in Agriculture and Forestry. Within the Agriculture sector, the Office of Agricultural Economics (OAE), under the Ministry of Agriculture and Cooperatives, acts as the sectoral lead agency. The OAE compiles livestock-related emissions data from the Department of Livestock Development (DLD), and cultivation-related emissions data from Rice Department (RD), the Department of Agriculture (DOA), Land Development Department (LDD) and the Geo-Informatics and Space Technology Development Agency (GISTDA) under the Ministry of Science and Technology. Within the Forestry sector, the Department of National Parks, Wildlife and Plant Conservation (DNP), under the Ministry of Natural Resources and Environment (MONRE), acts as sectoral lead agency. The DNP collects data from the Royal Forest Department (RFD), the Department of Marine and Coastal Resource (DMCR), the Rubber Authority of Thailand, the Land Development Department (LDD) and the Geo-Informatics and Space Technology Development Agency (GISTDA).

While these two data collection streams within the AFOLU sector in theory exist, formalized arrangements with clear mandates are currently missing, which has resulted in overlapping and intersecting work from the different agencies in the AFOLU sector in the past. In order to avoid this going forward, this output will clearly define the respective roles and responsibilities of all involved agencies and will expand where needed, not only for the governmental agencies involved, as listed above.

This output will build upon the existing coordination mechanism and the data collection and reporting streams in the AFOLU sector and will deliver a proposed set of institutional mechanisms for inter-ministerial cooperation on collecting, reporting and data-sharing in the AFOLU sector.

Following the strengthening of AFOLU related institutional arrangements, data-sharing agreements will be drafted, discussed with stakeholders and implemented. These agreements may also include subnational institutions where needed, including a clear definition of roles, mandates and responsibilities of the involved ministries, agencies and other data providers such as local governments and share activity data in a timely and consistent manner. Those agreements will significantly enhance and streamline the data collection process and guarantee access to data. The results of this output will

be discussed by stakeholders in a series of workshops (seven in total), building consensus to endorse the resulting mechanisms and agreements and strengthening ONEP's role as the national focal point for the GHG inventory reporting and resulting in smoother coordination at ministerial and sectoral levels.

This output will significantly build upon existing arrangements established for the purpose of the BUR and the NC preparation as well as the processes established as part of the Thailand GHG Emissions Inventory System. Here, data-sharing agreements will support the data collection processes in the AFOLU sector and will streamline the overall inventory process more. It will contribute to retaining institutional memory, including the lead agencies for each sector within AFOLU, and will further empower ONEP as the national lead agency to manage Thailand's GHG inventory process. The availability of and access to activity data is a pre-condition for the regular compilation of a national GHG inventory. With the new reporting requirements laid out by the MPGs, a national GHG inventory has to be provided on a biennial basis, either as stand-alone report (National Inventory Report) or as part of the Biennial Transparency Reports. This is a strengthening from the BUR provisions as per the Cancun Agreements, where developing countries were *encouraged* to submit a BUR every two years, from 2014, which few countries complied to. Thailand has submitted its first BUR in 2015, and the second BUR in 2017 and is now in the process of developing its third BUR.

To foster learning among CBIT countries, especially on the subject of appropriate institutional arrangements, this Output also includes taking part in CBIT global meetings that are conducted annually with participation of CBIT countries globally as well as donors and other relevant stakeholders in the field of transparency. Here exchange with FAO's CBIT projects, both the national projects such as in Cambodia and Benin, as well as the global CBIT-AFOLU project, will be of particular relevance for Thailand's CBIT project. All of FAO's projects focus on the AFOLU sector, so sharing of lessons-learned among FAO CBIT countries and Thailand will be most useful. However, due to the COVID-19 pandemic it is uncertain when the next global CBIT global meeting will take place. The last global CBIT meeting which was supposed to take place in Japan in Spring 2020 has been postponed to an unknown date. Given this uncertainty, participation in other relevant international conferences, workshops and capacity-building activities related to the Enhanced Transparency Framework will be considered in due course. Such a relevant meeting could be for example, the Transparency Days at the Conference of Parties, which have been organized by the Paris Committee on Capacity-Building. Some of these activities might move turn a virtual edition, however budget is set aside for physical participation of key staff in relevant transparency-related events.

Proposed activities and expected deliverables

Activity 1.1.1 Outline clear and detailed institutional roles, mandates and responsibilities of ministries, agencies and external data providers involved in data production, collection and reporting of the AFOLU sector

? Deliverable 1.1.A: Report on proposed institutional mechanisms for inter-ministerial cooperation on collecting, reporting and data-sharing in the AFOLU sector

Activity 1.1.2 Draft and implement data-sharing agreements for the different data providers in the AFOLU sectors

? Deliverable 1.1.B: Data-sharing agreements for AFOLU sector

Activity 1.1.3 Organize a stakeholder workshop with all involved data providers, about the institutional roles and tasks for data production, collection and reporting of AFOLU sector

? Deliverable 1.1.C: AFOLU sector stakeholder workshop and corresponding workshop report and materials

The deliverables of this output, the report on the proposed institutional mechanism and the data sharing agreements, will be submitted to the National Committee on Climate Change Policy (NCCC) for their approval and will thus be formalized and integrated into governmental processes. The NCCC is the highest climate-change related committee in Thailand, chaired by the Prime Minister, and is responsible for climate change policies and strategies. The NCCC also approves Thailand's Biennial Update Reports and National Communications.

Output 1.2 Sectorial guidelines, templates and tools for data collection developed and training provided to support operationalization of the web-based inventory system in the Agriculture, Forestry and other Land Use (AFOLU) sectors

This output will deliver standardized sectorial guidelines, templates and tools for data collection with a view to enhance consistency and comparability of data and to facilitate the overall data collection process, especially from line and auxiliary agencies. The guidelines, templates and tools will institute the procedures on how and what kind of data is collected, processed and reported in the AFOLU sector. Currently, standardized templates for data collection only exist for the lead agencies of the different

sectors but not for the multiple line agencies below them where activity data is collected. Consistent and comparable GHG emission data are preconditions for a robust and transparent GHG inventory and will, through common quality requirements, also enable further improvements in data quality over time. It further allows for a holistic evaluation of GHG emissions development which is key for enhancing ambition of climate actions and related policy adjustments. This output directly addresses the barrier of different and incomparable data collection formats and methodologies within the AFOLU sector, as described in the barrier analysis above. As of now, every agency is using different formats and methodologies for the collection of activity data which burdens the sectoral lead agencies (the Office of Agricultural Economic and the Department of National Parks, Wildlife and Plant Conservation) and ONEP, as the coordinating agency, with the harmonization of all the data and compiling the overall GHG inventory. The guidelines and templates will be developed in collaboration with national and/or regional experts within each subsector with a view to reflect their unique needs and characteristics, including gender considerations

Activities will specifically focus on the critical need identified by the stakeholders in the Forestry sector to clearly and accurately identify forested vs. non-forest areas, through clear guidelines (including templates and necessary tools) for aerial photography and satellite image interpretation, as well as for the identification of the forestry and non-forestry areas. Since several government agencies?such as the Land Development Department ?have had their own approach in determining land areas and land uses under their mandate, the project aims to develop a single set of data for the country in order to unify and ensure consistency of data used by different agencies. This product will contribute to higher level of accuracy, consistency and transparency of forestry sector data to be populated and utilized in the web-based inventory system (TGEIS). The responsible government agency for this output is the Geo-Informatics and Space Technology Development Agency (GISTDA) which is responsible for space technology and geo-informatics applications. Currently, GISTDA has no official mandate for undertaking satellite interpretation in relation to climate change. This will be overcome through the activities under Output 1.1.1 in defining and implementing clear roles for all agencies within the AFOLU sector and will thus form the basis for this output.

Following the completion in Activities 1.2.1 and 1.2.2, the training will be provided by national experts from local universities with a view to enhance the national technical capacity and to ensure the strengthening of local capacity building skills and the sustainability of the training. This output complements the Thailand Greenhouse Gas Inventory System (TGEIS). The TGEIS project supported developing an IT based tool in line with the IPCC 2006 Guidelines for estimating GHG emissions. This will build on the TGEIS work and develop guidelines and templates for use by line agencies in the AFOLU sector in collecting data required for input to the TGEIS system. Tailor-made guidelines which are applicable in the Thai AFOLU context, as opposed to the use of standard IPCC Guidelines are considered essential to not only take into account the existing data flows, structures and limitations in the sector but also to increase the sustainability of the use of the guidelines. Training on the guidelines and the use of the templates and tools will be provided to staff in line agencies in the AFOLU sector to build the necessary technical capacity in-house instead of outsourcing this task to external consultants.

The development of sectorial guidelines directly addresses the issue of high staff turnover and will help to ensure continuity of data collection processes in the different sectors.

Proposed activities

Activity 1.2.1 Develop sector-specific guidelines and templates for data collection in the Forestry sector

? Deliverable 1.2.A: Guidelines (including templates and necessary tools) for aerial photography and satellite image interpretation, and identification of forestry and non-forestry areas

Activity 1.2.2 Develop the data collection systems of the forestry/non-forestry areas, soil carbon emissions and livestock manure management for the subsequent calculations of GHG inventories in the existing web-based inventory system (TGEIS)

? Deliverable 1.2.B: Data collection systems for Forestry, Land Use and Livestock under AFOLU sector

Activity 1.2.3 Deliver training on Forestry sector guidelines and templates to technical staff involved in the GHG inventory process

? Deliverable 1.2.C: Training workshop report and materials on Forestry sector guidelines for data collection

To ensure the sustainability of the deliverables under this output, GISTDA as the responsible entity for this output will ensure the updating of the guidelines and data collection systems, if necessary.

Output 1.3 Country-specific emission factors following IPCC Guidelines developed in the Agriculture, Forestry and other Land Use (AFOLU) and Energy Sectors

This output will deliver country-specific emission factors for selected categories in the AFOLU sector as well as one category in the Energy sector. Thailand has been using IPCC default emission factors for calculating GHG emissions from all of the five inventory sectors. For the GHG inventory represented

in the TNC, only IPCC default emission factors have been applied in the Energy and IPPU sector. Considering that the Energy sector contributes more than 70% (or 260 Mt CO₂e) to Thailand's total GHG emissions, the development of country-specific emission factors within this sector will likely have a large impact on the accuracy of Thailand's overall GHG inventory and is also considered good practice as per the 2006 IPCC Guidelines. The TNC specifically points out the need to develop country-specific emission factors for the main fuels in the country, including biofuels, as well as for emission factors in certain sub-sectors within agriculture. Under the NC4-BUR3 project an initial step is taken to improve the emissions factors but the focus will be on reviewing the literature and updating the existing default emission factors used. Only in some sub-sectors, country-specific emission factors have been applied. Within Agriculture for instance, country-specific emission factors have been developed for rice cultivation, enteric fermentation (cattle and buffalo, not swine), but given the importance of the sector for Thailand's economy and its emissions, much more work is needed. The use of default emission factors likely leads to an overestimation of Thailand's GHG emissions. In the second BUR for example, the national GHG emissions from the SNC have been recalculated for the years 2000-2004 through the use of updated activity data and revised emission factors, which led to total lower GHG emissions for the whole period. Thus, using country-specific emission factors significantly enhances the accuracy of GHG emissions estimations due to a more precise reflection of national circumstances. The use of country-specific emission factors in the preparation of national greenhouse gas inventories is also encouraged in the modalities, procedures and guidelines. The CBIT project will help to take this further by developing local emission factors within Energy, and Agriculture[37]³⁷, as two of the sectors with the largest GHG emissions in Thailand. This will include mapping the process and technologies used and undertaking actual measurements to collect the necessary data to determine country specific emission factors in these sectors. Starting from these sectors, emission factors for the other sectors can be developed, which has been recognized as need in Thailand's TNC process (see barrier analysis above).

The identified categories for emission factor development in the AFOLU sector are 'Agricultural Soils' and 'Manure Management', which account for 22.95% and 6.95% respectively of the total Agricultural GHG emissions. Manure management is the second largest source of GHG emissions in the sector, while Agricultural soils is the fourth largest source of GHG emissions.

For the GHG inventory presented in Thailand's TNC, a default emissions factor and Tier 1 have been used for estimating the nitrous oxide emissions of 'Agricultural Soils'. Tiers represent the methodological complexity and are described for categorizing both emissions factors and activity data. Tier 1 here refers to the use of a default emission factors as provided by the IPCC. For 'Manure Management', both default and country-specific emission factors, or a combination of Tier 1 and 2 approaches, have been used for estimating methane emissions (CH₄) in this category. However, for nitrous oxide emissions (N₂O) resulting from 'Manure management' default emission factors have

been used. As part of the Asia Pacific Regional Workshop of the Partnership for Transparency in the Paris Agreement (PATPA) in 2019, Thailand specifically pointed out the need to move towards country specific emission factors that take into account the factors that control GHG fluxes in agricultural processes, and thereby, lead to a reduction in the associated uncertainty[38]³⁸.

Activities on related to developing a country-specific emission factor for 'Agricultural Soils' will involve both extensive fieldwork and research activities for the development of the data pool specifically for the purposes of soil carbon emissions assessment. The aim is to develop a 'Soil Carbon Emission Map' to establish the baseline of soil inventory covering the entire country. For the development of a country-specific emission factor for 'Manure Management' (for nitrous oxide and partially for methane emissions) thorough fieldwork and research will be conducted.

The development of country specific EFs for the main fuels in the energy sector was identified as the key need in the TNC. The Energy sector is by far the largest sector in terms of GHG emissions in the Thai context, thus improvement in EF for main fuels will improvement the accuracy and the quality of future GHG inventories in Thailand. The identified category for emission factor development in the Energy sector relates to selected fuels, covering the most common fuels including diesel and petroleum. Specifically, the objective is to update the data on (i) Carbon content, and (ii) Net Calorific Value (NCV) to support the development of country-specific emission factors in this sector. Given the use of similar fuels, this output will also improve GHG inventories from the Energy sub-sectors manufacturing industries and construction.

For the GHG inventory prepared for the TNC, default emission factors by the IPCC (Tier 1) have been used for all 'Fuel Combustion Activities' as well as for 'Fugitive Emissions from Fuels. The net calorific value of each fuel followed the official annual reports of the Ministry of Energy. However, an update of these values is required to increase accuracy of emissions data in the energy sector. The carbon content and the net calorific value of selected fuels will be updated in collaboration with local experts through measurements and testing.

Proposed activities

Activity 1.3.1 In collaboration with local experts, develop country-specific emission pool for agricultural soils

? Deliverable 1.3.A: Report on soil carbon emissions

Activity 1.3.2 In collaboration with local experts, develop relevant data set for the establishment of country-specific emission factors for the manure management in Livestock sector

? Deliverable 1.3.B: Report on necessary data for emission factor development in the Livestock sector

Activity 1.3.3 In collaboration with local experts, develop country-specific emission factors for selected fuels in Energy sector

? Deliverable 1.3.C: Report on emission factor development in Energy sector

Following the development of the reports on the emission factors in the three different categories, ONEP as the responsible agency for the GHG inventory, will adopt them for the application and integration in the TGEIS.

Output 1.4 Methodology and system for QA/QC for data from the Forestry sector developed

Quality assurance (QA) and quality control (QC) are essential procedures for ensuring the quality of data in the process of GHG inventory compilation. Establishing a QA/QC system, including the elaboration of a QA/QC plan and related procedures, facilitates a regular GHG inventory compilation, which involves large amounts of data and information, provided by different agencies and institutions. Ten different agencies are involved in the Forestry sector. For the purpose of preparing the SBUR and TNC, Thailand has established QA/QC procedures where lead agencies from each sector check and verify GHG emissions data (QA) provided by the different agencies before submission to ONEP, who calculates the GHG emissions. The results are subsequently submitted to five working group, the appointed representatives of the five sectors, for review. However, despite this system in place, QA/QC procedures within Forestry remain insufficient. This output therefore directly addresses the need for an enhanced QA/QC system as outlined in the barrier analysis above and is complemented by output 1.1.1 on formalized institutional arrangements. This output will also complement the Thailand Greenhouse Gas Emission Inventory System. Building on the QA/QC procedures of the BUR and NC processes, this output will deliver a well-defined and institutionalized QA/QC system specifically for the Forestry sector, including methodologies and guidelines for the different agencies, with a view to strengthen the integrity, correctness and completeness of Thailand's GHG inventories and enhance technical capacities in the long-term.

Activities under this output focus on the development of a QA/QC plan for the Forestry sector and include defining general and category-specific QC procedures and methods, following IPCC guidance; defining QA review procedures to assess the quality of data collected; outlining a schedule for sector-specific QA/QC activities in the Forestry sector, from initiation of the inventory process through to the reporting of the final GHG results; assigning personnel to coordinate and undertake those QA/QC activities; and defining documentation, reporting and archiving procedures of inventory material and QC activities. To facilitate the deployment of increase effectiveness of the QA/QC provisions, specific guidance will be developed, incorporating existing practices from the different agencies in the Forestry sector. This will provide the basis for adopting detailed QA/QC procedures in other sectors.

The compilation of a GHG inventory is not an on-off exercise but a regular and comprehensive undertaking. Thus, standardized procedures for data collection and estimation with several control points are necessary to ensure a standard quality of the GHG inventory and to increase adherence to the TACCC accounting principles, which is considered good practice. A QA/QC system will also allow for continuous improvement of the GHG inventory process with a view to comply with the Enhanced Transparency Framework. The QA/QC system will follow 2006 IPCC's General Guidance and Reporting procedures (vol.1, Ch. 6.) as well as sector-specific IPCC guidance (vol. 2 & vol. 4). As part of the GHG inventory under the Biennial Transparency Reports, countries are specifically requested to ?elaborate an inventory QA/QC plan in accordance with the IPCC guidelines referred to in paragraph 20 above? (2006 IPCC guidelines and any subsequent refinements).

Proposed activities

Activity 1.4.1 Develop guidance on the application of QA/QC procedures in the GHG inventory compilation for the Forestry sector

? Deliverable 1.4.A: Resulting from activities 1.4.1 and 1.4.2: Guidance on the application of QA/QC procedures in the GHG inventory compilation for the Forestry sector

Activity 1.4.2 Hold a final stakeholder workshop for all staff in the different agencies involved in the GHG inventory process, as well as other relevant data-providers (e.g. sub-national entities)

? Deliverable 1.4.B: Report of the stakeholder workshop for GHG inventory process in the Forestry sector

Following the development of the guidance on the QA/QC procedure has established, the government will integrate this guidance into the existing data reporting structures in the forestry sector and relevant staff in the different agencies will be trained on the use of this guidance.

Component 2: Strengthening tracking and reporting of Thailand's mitigation action

Thailand's initial NDC and the related NDC Roadmap covers mitigation actions within Energy, Transport, IPPU and Waste to be achieved through a large number of sectoral plans such as the Power Development Plan. As elaborated in the Baseline Scenario (see table 3), Thailand receives targeted support within the NDC sectors, particularly through the Thai-German Climate Programme by the GIZ as well as other GIZ projects, such as the RAC NAMA and the TRANSfer projects. The Global Green Growth Institute provided specific NDC support for the Industrial sector. Thailand also became a member of the NDC Partnership in the beginning of 2020. As such, this CBIT project will focus on mitigation actions outside Thailand's NDC.

Although Thailand's Agriculture sector is not included in its current NDC, Thailand aims to incorporate agricultural mitigation measures in its next NDC, due in 2025. The Agriculture sector is the second largest source of GHG emissions in the country and a major economic sector, employing roughly one third of Thailand's labor force. Few projects targeting mitigation in the Agriculture sector, such as the Thai Rice NAMA, exist. Thailand specifically included a section on "Other Mitigation Measures beyond Thailand's NAMA and NDC Roadmap" in its TNC and listed potential eight mitigation measures in the Agriculture sector and four measures LULUCF sector. Notwithstanding, that mitigation measures within the Agriculture sector do not count towards Thailand's NDC, they equally require thorough monitoring procedures, especially if they will be integrated in Thailand's second NDC. As such, tracking progress of mitigation actions is essential for raising ambition in the NDC cycles as called for by the Paris Agreement.

This component will provide the basis for tracking mitigation action in the Agriculture Sector through the enhancement of institutional arrangements, development of monitoring indicators and methodologies, tools and templates for estimating greenhouse gas reduction. Doing so, Thailand will have the necessary basis for integration of Agriculture mitigation measures in the future.

Outcome 2: Thailand's transparency framework is enabled to track progress in implementing its mitigation action and report regularly as per Paris Agreement

Work under this Outcome will specifically focus on 'Open burning reduction' as mitigation measure in the Agriculture sector. Initially, five key measures were identified for this outcome: (i) Alternate wetting and drying water management irrigated rice field, (ii) Biogas, (iii) Animal feed, (iv) Fertilization, and (v) Open burning reduction. However, four of these measures are being further analyzed through other projects and studies. For example, the Department of Livestock Development, in close collaboration with the Thailand Greenhouse Gas Management Organization, is conducting a study on biogas as a mitigation measure. The measure on 'Alternate wetting and drying water management irrigated rice field' is included in the Thai Rice NAMA project, which is implemented by the GIZ (see Table 3 for project details). After consultation between the Office of Agricultural Economics (OAE) and the Department of Livestock Development, both agencies agreed that the measure of open burning reduction should be included in and further analyzed through this CBIT project. Importantly, the focus on this measure in this CBIT project has also been approved by the Agricultural Sector Working Group for GHG data collection.

Open burning of agricultural residues is a common agricultural practice in Thailand and is often used on rice, sugarcane and corn fields to remove crop residues, control weeds and prepare the land for the next crop cycle. Open burning is a more cost-effective measure than mechanical clearing and is also a quicker method as there is often a very short period between harvesting and cultivation of the next crop. Open burning on rice fields is particularly common in Thailand's central and lower northern regions. This activity is a source of different greenhouse gases: carbon dioxide (CO₂), carbon monoxide (CO), methane (CH₄), nitrous oxide (N₂O), nitrogen oxide (NO_x) and comparatively less Sulphur dioxide (SO₂). Open burning further leads to aerosols, notably black carbon, and hydrocarbons in the atmosphere due to the incomplete burning of organic matter.

In Thailand's second BUR, field burning of crop residues amounted to 1,825.76 GgCO₂eq or 3.59% of the total Agriculture emissions. Although it is the smallest source of emissions in the Agriculture sector, compared to for instance rice cultivation with a share of 54.72%, the reduction of open burning is a priority issue in Thailand due to its large impact on air pollution, in the form of PM_{2.5}, and the resulting health issues. Substances released through open burning further contribute to the formation of ground-level ozone. The World Health Organisation states that there is enough evidence that exposures to PM_{2.5} and ground-level ozone are the most health damaging types of air pollution and account for large attributable health burdens[39]³⁹.

The burning of crop residues has a strong seasonality and significantly increases PM_{2.5} concentrations in the dry season and contributing to local and regional pollution episodes. Haze resulting from open burning of agricultural residues particularly affects Thailand's northern and southern regions but also Bangkok is often heavily affected by haze pollution, in addition to air pollution from other sources,

including transport and industry activities. However, haze is not only a national but also a transboundary pollution problem in Southeast Asia. To tackle this widespread issue, ten ASEAN member countries signed the 'ASEAN Agreement on Transboundary Haze Pollution' already in 2002, however with limited results to date. Thailand is also a member of the Climate and Clean Air Coalition (CCAC), a global partnership to reduce short-lived climate pollutants, which has an 'Open Burning Global Transition Strategy'. According to the CCAC, 'no-burning' methods of managing agricultural waste have the potential to reduce black carbon emissions by half[40]⁴⁰. Globally, the reduction of short-lived climate pollutants (SLCPs), such as black carbon, methane and nitrous oxide, is central in limiting global temperature increases. As reported in the UNEP Emission Gap Report (2017), reducing SLCPs has the potential to decrease the rate and degree of warming in the next few decades, due to their rapid effect on temperature, as opposed to reducing CO₂ emissions with a slow effect on temperature decreases.

In addition to causing health problems and contributing to global warming, open burning of agricultural residues is detrimental to soil quality as much of the nutrients such as nitrogen, phosphorous and potassium are released into the air. By incorporating the residues into the soil, instead of burning, the soil organic matter and drought resistance increases, and farmers achieve higher yields fields[41]⁴¹. Focusing on open burning reduction as a mitigation measure as part of this CBIT project will thus contribute to generating multiple co-benefits. Most importantly, the reduction of open burning will support Thailand in achieving progress towards the Sustainable Development Goals, and the specific SDG targets 3.9[42]⁴² and 11.6[43]⁴³.

This is also aligned with information in the TNC (section 3.2.6, p. 63) under 'Agricultural mitigation measures' where it is specifically stated that 'Mitigation options should be developed alongside *other co-benefits*, including climate change adaptation, farmer's economics, quality of life and the environment' (italics added). Further health and economic benefits of the reduction of open burning are elaborated on in this document in section 6.) Global environmental benefits and/or adaptation benefits.

The outputs under this outcome will enable design and implement climate actions to reduce GHG emissions in the Agriculture sector. The strengthened capacities to monitor the implementation of mitigation actions in this sector and plan actions for the sector would support their inclusion in the future NDCs and strengthen the coverage of NDC in addressing emissions. Better data would also enable assessing effectiveness of policies and allow better designed interventions. Overall, the enhanced collaboration resulting from formalization of institutional arrangements as well as the

bottom-up and top-down communication between institutions, providing the GHG impact data, and Thailand's decision-making bodies will be better positioned for adjusting policies for enhancing effectiveness and ambition.

Output 2.1 Institutional arrangements for the tracking of mitigation action, including quality check of GHG reduction estimations, formalized in the Agricultural sector

This output will deliver formalized institutional arrangements for the tracking of the selected mitigation action on open burning reduction within the Agricultural sector. As reported in Thailand's TNC, stopping crop-burning has been encouraged by Thailand's relevant government agencies and the Department of Agricultural Extension (DOAE) has promoted the project of 'No burning in croplands' nation-wide with an emphasis on the Northern part of Thailand. The Geo-Informatics and Space Technology Development Agency is hereby of particular importance in identifying hotspots in croplands.

The DOAE also provided education to farmers on crop residue management. The Land Development Department equally promoted a no-burning policy. Thailand's '20-Year Agriculture and Cooperatives Strategy' specifically includes an indicator on 'The number of farmers who stop burning their land [?]' amounts to 76,900 person(s)'. As such, open burning reduction it is an important mitigation measure in the Thai agricultural context, despite not counting towards Thailand's NDC.

Thailand's institutional arrangements for monitoring of mitigation actions have improved from the FBUR to the SBUR. However, a need remains for a formalized and permanent institutional framework for the evaluation of Thailand's climate actions. This is particularly needed in the Agricultural sector, given its strategic and developmental importance, and its comparatively later incorporation into institutionalized national mitigation efforts. Building on the preliminary institutional structure, notably through the Working Group on GHG Inventory and Mitigation Measure under the National Committed on Climate Change, this output will formalize the necessary institutional arrangements of the monitoring of GHG emission reductions related to open burning reduction, including processes and procedures for collection, reporting and quality control of GHG estimations. The project will assess the existing processes and procedures for data collection related to open burning reduction. To this end, the project will seek collaboration and/or knowledge exchange with the Thailand Rice NAMA. Although it only focuses on the rice sector, one of the 'mitigation technologies' included in the NAMA is 'Straw and stubble management'. The Thailand Rice NAMA, implemented by the GIZ, works closely together with the Rice Department, which will form part of the institutional arrangements to be put on place through this CBIT project.

Overall, the formalization of institutional arrangements will enhance the collaboration between ministries and as well as the bottom-up and top-down communication between institutions, providing the GHG impact data, and Thailand's decision-making bodies, adjusting policies if needed. Well-functioning inter-ministry collaboration is key for achieving a long-term sustainable transparency framework and streamlining overall information processes and flows. Lessons learned from this exercise can be transferred to other sectors.

Proposed activities

Activity 2.1.1 Strengthen and formalize the institutional arrangements for the monitoring of open burning reduction measures in the Agriculture sector, including outlining the responsibilities of relevant institutions to deliver the necessary data and information to track progress.

? Deliverable 2.1. A: Report of proposed institutional arrangements for tracking of open burning reduction measures

Activity 2.1.2 Adjust and develop processes and procedures for data collection, reporting, and quality control of GHG estimations from open burning reduction measures in the Agriculture sector

? Deliverable 2.1. B: Guidelines of processes and procedures for collection, reporting, and quality control of GHG estimations from open burning reduction measures

The Office of Agricultural Economics (OAE) as the lead agency for the Agriculture sector will submit the deliverables of this output to the Agricultural Sector Working Group for GHG Data Collection for their approval. Subsequently, the relevant agencies both at central and local level will be assigned to conduct the tracking activities of open burning reduction.

Output 2.2 Monitoring indicators and information matrix to track progress of mitigation action in the Agricultural sector developed, and training to lead agencies to report indicators is provided

This output will deliver monitoring indicators and an information matrix to track progress of mitigation action in the Agricultural sector and will provide training to staff from the relevant agencies in the sector. As outlined in the barrier analysis above, Thailand is lacking relevant methodologies and tools,

and related human capacities, for tracking progress of mitigation actions, which will be addressed through this output. An integrated exercise will be conducted to identify existing metrics and indicators, information compilation mechanisms and how they fit into overall mitigation action tracking, incorporating the monitoring and evaluation system for the selected agricultural mitigation action (open burning reduction).

Proposed activities

Activity 2.2.1 In collaboration with sectorial experts and agencies, identify sector-specific indicators and information matrix for tracking of open burning reduction measures in the agriculture sector

Activity 2.2.2 Develop monitoring and evaluation system to monitor the implementation of open burning reduction measures in the agriculture sector

? Deliverable 2.2.A, resulting from activities 2.2.1 and 2.2.2: Guidelines for the sector-specific indicators, information matrix, and evaluation system for open burning reduction measures

The deliverable of this output will be embedded into the processes of the relevant agencies (local and central bodies) as appropriate. The exact application will be determined by responsible agencies accordingly.

Output 2.3 Methodologies, tools, and templates for estimating GHG emissions reduction impacts in the Agricultural sector developed, and capacity building of stakeholders on the usage of the tools provided

Under this output existing methodologies/tools to estimate GHG emissions reductions in the Agriculture sector will be assessed, gaps will be identified, and further development areas will be determined. The training will be provided by national experts with a view to enhance the national technical capacity and to ensure adequate technical understandings by the responsible agencies on the information matrix and the reporting on the specific indicators, as well as methodological tools and templates for the estimation of GHG emissions reductions. This output will also include a peer-to-peer exchange workshop with subnational authorities on tracking progress of open burning reduction measures in the Agriculture sector. The focus on waste and agricultural residues in the Alternative Energy Development Plan (AEDP) is a good example of policy coordination and alignment with

decentralized implementation. The AEDP objectives are aligned with those of the National Economic and Social Development Plan (NESDP) as well as laws for municipal level governance. Thailand's economy is largely based on the production and export of agricultural products such as rice, sugarcane and palm oil, and related biomass residues can be used for the production of electricity or biogas.

Proposed activities

Activity 2.3.1 Assess fitness for purpose, and if necessary, adapt existing methodologies/tools to estimate GHG emissions reductions in the agricultural sector

Activity 2.3.2 Develop methodologies and templates for the specific purpose of the open burning reduction measure

? Deliverable 2.3.A, resulting from activities 2.3.1 and 2.3.2: Guidelines, including templates on estimating GHG emissions reduction impacts from open burning reduction in the Agriculture sector, incorporating results from Outputs 2.1 and 2.2

Activity 2.3.3 Provide training to staff in relevant agencies on the use of the information matrix and the reporting on the specific indicators, as well as methodological tools and templates for the estimation of GHG emissions reductions

? Deliverable 2.3.B: Training and corresponding materials for open burning reduction measures

ONEP has developed a reporting system for tracking mitigation actions under the NDC Roadmap from the relevant agencies. The templates delivered under this output will be synchronized and integrated to the existing reporting system at ONEP, with the possibility for incorporation in future Biennial Transparency Reports, if measure is included in the NDC, and subsequent National Communications.

Component 3: Enhancing tracking of support for NDC implementation

This component will focus on the characterization and tracking of support received, thus covering one of the least advanced areas on average of the ETF. Efforts within this component will complement the existing national system and protocols, developed by ONEP, to measure and track the financial flows

and identify the institutional arrangements for the existing donor procedures/guidelines for tracking, reporting and verifying the support received towards climate change mitigation and adaptation in Thailand. Although the reporting on support needed and received is only a voluntary reporting element in the Biennial Transparency Reports, this information will facilitate improved planning and prioritization of funds and areas of support and will support the identification of gaps in relation to support needed vs. support received.

As per the modalities, procedures and guidelines, developing countries are encouraged to provide information on financial support needed and received and should provide a number of informational elements in a tabular format, including the type of financial instrument, the sector and sub-sector and the area of support, among other. In addition to that, developing countries are asked to provide information on national circumstances and institutional arrangements in relation to support received/needed as well as a description of the systems and processes for tracking support received/needed as well as encountered challenges and limitations.

Outcome 3 Thailand has systems and tools to effectively track international support received and report transparently as per international obligations

Acknowledging the importance of transparency of support received/needed, ONEP has initiated the development of a database system for international support needed and received. The system has been up and running with different levels of accessibility. Administrative management is by (ONEP) and its staff is responsible for inputting and adjusting raw data received from partner agencies. The public interface allows wider public and donors to view the final data, information and analysis. The data is collected from relevant line agencies and processed by ONEP on annual basis. ONEP will be the responsible agency for this system and data from the relevant agencies is collected through the reporting templates. The CBIT project will build upon this system contributing specifically on adjusting it to the standard of BTR reporting requirements. This will provide the basis for regular data flow, as well as with the development of user-friendly web-based templates, to facilitate the reporting of information. In addition to that, a training on the reporting of supported received will be conducted.

The outputs will result in better systems to track continuously the resources allocated to different climate action, assess the gaps and overlaps in the financing and appropriately allocate resources for different sector. The gaps in financial flows will also be addressed through designing policies and regulations that increasingly integrate climate change into finance flows from government and non-government sources.

Output 3.1 Institutional arrangements to track support received established

This output will deliver relevant institutional arrangements to enhance the coordination and information flow among ministries and agencies on support received and linking it with the NDC investment strategy. ONEP, as a climate change national focal point will be responsible for the tracking of international support received for climate change and NDC implementation, with the support from all relevant focal agencies in each sector.

Activities under this output include a stocktaking of existing mandates, processes and procedures of key agencies in order to understand and elaborate the roles and responsibilities of all agencies in tracking climate change related international support received. Furthermore, gaps and barriers to financial data collection and reporting will be identified and possibilities to overcome those barriers will be explored. The advancement of institutional arrangements will not only ensure a steady data flow of information to ONEP but will also increase the collaboration between agencies on this topic.

The enhancement of institutional arrangements and the tracking of financial support received, provides for an excellent opportunity to integrate sex-disaggregated indicators. Funds are dedicated for a consultant to work together with the team to identify leverage points for the project where the integration of gender is most crucial. Based on this analysis, a Gender Action Plan will be developed which will be integrated into the project execution.

Proposed activities

Activity 3.1.1 Take stock of current institutional arrangements, including procedures and processes of involved agencies and ministries in relation to storing and reporting information on support received

Activity 3.1.2 Identify gaps and barriers in relation to the flow of information on support received and inter-ministerial communication

Activity 3.1.3 Establish and formalize institutional arrangements, outlining reporting responsibilities

? Deliverable 3.1.A, resulting from activities 3.1.1 and 3.1.2: Report on proposed institutional arrangements, for the tracking of support received

Activity 3.1.4 Conduct a study to devise a Gender Action Plan for the project as a whole

? Deliverable 3.1.B: Gender Action Plan

The report on the institutional arrangements will be presented to the National Committee on Climate Change Policy (NCCC) for its approval and subsequent implementation.

Output 3.2 Web-based templates and training for reporting of the MRV of support developed and disseminated

For the database system that ONEP has initiated for the tracking of support received basic templates have been designed requiring ONEP to enter the data into the system. As the database system is only in its beginning phase, it will benefit from the development of advanced and user-friendly web-based templates. ONEP plans to collect and store data on international support received electronically to ease and facilitate the reporting by the respective ministries and agencies and ministries into the system. For the development of the web-based templates the exact (voluntary) reporting requirements of support needed and received, as per the MPGs, will be assessed and the reporting templates will be configured accordingly. Furthermore, backup support and provisions for updates of the templates will be identified. A trial run of the system and a test reporting of the web-based templates will be conducted, to check for the operability and user-friendliness of the web-based templates and the system and identify potential improvement areas. To ensure a proper understanding of the database system and on the reporting requirements, two trainings will be provided to staff in relevant ministries and agencies.

Proposed activities:

Activity 3.2.1 Assess reporting requirements on support needed and received, as laid out in the modalities, procedures and guidelines and compare with informational elements of the existing basic templates.

Activity 3.2.2 Generate an appropriate web-based reporting template for international climate support received in compliance with the MPG requirements

? Deliverable 3.2.A, resulting from activities 3.1.2.1 and 3.1.2.2: Web-based reporting template framework for international support received

Activity 3.2.3 Deliver trainings on the use of the web-based reporting templates

? Deliverable 3. 2.B: Trainings and training materials on monitoring and evaluation framework for international support tracking

Activity 3.2.4 Conduct trial run of the system and test the web-based reporting template with selected agency and to report on support received

? Deliverable 3.2.C: Summary report of trial activities with selected agency

The web-based reporting templates will be integrated by ONEP into the existing tracking system to be used by the different agencies. ONEP has already encouraged relevant agencies to report information on support needed/received in the context of the NC and BUR preparation. The web-based reporting templates will ease the reporting process for the relevant agencies and thereby enhance the ONEP's tracking system.

Component 4: Strengthening of transparency framework for adaptation actions and resilience building

This component focuses on improving the use of existing data and the ongoing collection of data on vulnerability and adaptation in order to mainstream climate change adaptation into relevant sectoral policies in Thailand.

Outcome 4 Thailand has tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development in the Agriculture Sector

Although Thailand has integrated adaptation in its Climate Change Master Plan and other national policies, information on climate related risks and specific adaptation options was lacking. Furthermore, an insufficient integration of adaptation needs in subnational planning processes was noticed. Responding to these gaps, Thailand has been engaging in the NAP Process since 2015, starting with studying climate projections and vulnerability, and conducting a risk assessment in six sectors (water management, public health, tourism, natural resources management, human settlement & security, and agriculture and food security). A specific working group for the NAP development working was established under the Subcommittee on Climate Change Policy and Planning Integration. In 2016, a database of best practices and adaptation options has been developed and a first NAP has been drafted which was subject to public hearings. In 2017, adaptation was integrated into selected pilot areas and pilot sectors. In 2018, the monitoring and evaluation structure of adaptation has been studied and the second NAP draft has been elaborated. A national public hearing was conducted on the second draft NAP, which was subsequently approved by the National Committee on Climate Change at the end of 2018.

The NAP consists of national and sector-specific risk assessments as well as sector-specific adaptation measures and its timeframe is aligned with the 20-year National Strategy and the National Economic Social Development with a five-year revision cycle. The NAP encompasses the six adaptation sectors, as included in the Climate Change Master Plan, and related sectoral strategies with one inter-sectoral strategy on capacity building. The NAP development process unveiled the different starting point of the sectors in addressing climate change, where some ministries have already elaborated sector-specific strategies and others have initiated the process during the NAP. The Ministry of Public Health for instance has finalized its 'National Strategy on Adaptation in the Health sector' and the Ministry of Finance together with MONRE develops an 'Integrated Budget Allocation Framework'. The NAP document serves to communicate progress in the adaptation component of the NDC and the first revision of Thailand's NDC which is prepared in 2020 will feature the NAP goals.

The NAP development process pointed out the importance of adequate data bases and data sets, especially for downscaling projections to the regional and sectoral level, and for developing a monitoring system and defining clear indicators for adaptation targets. The process for establishing monitoring and evaluation procedures for adaptation action is considered to be 'at an early stage' (GIZ 2018)[44]⁴⁴.

In 2017, a workshop specifically focusing on developing an M&E framework for the Thai National Adaptation Plan has been held with stakeholders from the Office of Agriculture Economics, the

Department of Health, the Office of The National Economic and Social Development Board and the Department of Water Resources as well as representatives from non-governmental agencies and international organizations. During the workshop, indicators that were used in the draft Thai NAP, in particular from the agricultural and health sectors, were reviewed and further revised.

A NAP M&E framework is being developed with a focus on aligning it with parallel processes for M&E of adaptation in the different ministries. Challenges and key factors pointed out in relation to the M&E Framework include, among other, interpretation and consistency of data, unification and standardization of the database system as well as continuity of adaptation work and support[45]⁴⁵. Addressing the need for continuous support, Component 4 of the CBIT project will build upon the existing M&E structures and procedures and will advance Thailand's efforts in tracking adaptation actions.

The CBIT project will also consider earlier projects that assisted Thailand in furthering the NAP process, notably GIZ's Risk NAP project and the NAP-Ag project by UNDP and FAO. Due to its sectoral focus on agriculture, the NAP-Ag project is of particular importance for the CBIT project. For example, the NAP-Ag project supported the Office of Agriculture Economics in strengthening M&E processes for adaptation consistent with the results framework of the NAP. Under the NAP-AG project, potential indicators to monitor adaptation processes in the Agriculture sector have been explored, building on existing M&E frameworks by the Ministry of Agriculture and Cooperatives, and related capacity-building has been provided. However, a report on the NAP-Ag points out that M&E of adaptation activities "remains a challenge for the successful implementation of the Agriculture Strategic Plan on Climate Change (ASPCC)"[46]⁴⁶. The NAP-Ag project unveiled a distinct need for effective systems for M&E which can complement existing monitoring systems at the sector level as well as the need for resources for the collection and evaluation of data on agriculture adaptation projects for the implementation of the ASPCC and the adaptation component of the NAP. Another challenge pointed out by the NAP-Ag programme is the inconsistency of data availability on climate and impact analysis across different agencies under the Ministry of Agriculture and Cooperatives, which hinders adaptation mainstreaming into their programming and planning processes.

Outcome 4 of the CBIT project will build on the comprehensive efforts of the NAP-Ag project with a view to overcome the highlighted challenges and to generally advance the work on monitoring and evaluation of adaptation and improve data on vulnerability and risks. The ongoing NAP process in Thailand delivered some key M&E elements 1) risk maps based on risk or vulnerability georeferenced databases, 2) a database of existing adaptation measures to reduce vulnerability, and 3) an M&E framework.

However, conducting systematic climate risk and vulnerability assessments, and Adaptation M&E will face significant challenges, including the absence of a comprehensive database that integrates the mentioned elements, and/or additional information. Such additional information may be highly relevant, including research, case studies, and the results of the M&E of individual adaptation projects. Thus, there would be a value in developing a unified platform ? a national gateway ? for planners in line ministries to access information on: 1) Sectoral vulnerability indicators; 2) Risk maps and georeferenced databases; 3) Adaptation options; and 4) Projections of climatic impacts. Ongoing projects and processes, notably the NAP, are oriented in that direction by building up the evidence base and M&E procedures and indicators. The CBIT will support these efforts by targeting some of the many intermediate steps in the in the process towards such platform. The whole of component 4 will be supported by experts from Chiang Mai University, which were involved in the Risk-NAP project and worked on issues related to the Agriculture sector including vulnerabilities, risks, and food security. As such, they are well-positioned to continue similar work with focus on M&E under this CBIT project and ensures continuity of outcomes of the Risk-NAP project.

Output 4.1.1 Metrics, indicators and methodologies for Agriculture for the purpose of tracking the adaptation goals outlined in the NDC and NAP developed

Besides their fundamental role in vulnerability reduction and resilience building, subnational and local authorities are crucial stakeholders for an effective tracking of adaptation goals. However, their involvement in M&E of adaptation actions tends to be limited as has also been pointed out by the NAP-Ag project. Often times the metrics, indicators and methodologies used at the national level are not operational for regular use at the subnational or local levels due to for example different scales and varying quality of information. Current vulnerability and adaptation tracking in Thailand remain largely centralized and top-down. However, recent activities are aiming at the involvement of local authorities in adaptation planning, with local plans being developed in several regions. Adapting metrics, indicators and methodologies to their needs and circumstances while maintaining comparability would aid in in facilitating their engagement.

Although the reporting on adaptation under the Enhanced Transparency Framework is not mandatory, Thailand aims to systematically construct sector-specific M&E approaches in all six priority sectors of the NAP. Here, Agriculture is to be the first sector where a comprehensive M&E approach is to be developed. A summary report will be elaborated on relevant data and information regarding climate change impacts and adaptation in Agriculture, on a national and subnational level, as well as existing and proposed metrics, indicators and methodologies. Based on the review in Activity 4.1.1, the development of draft metrics, indicators and methodologies is expected to fill in any gaps in M&E in this sector and especially for use at a local level. A consultation with relevant agencies and subnational

stakeholder for the draft metrics, indicators and methodologies for climate change impacts and adaptation in the Agriculture sector will be held within this activity. In addition, the draft metrics, indicators and methodologies for the Agriculture sector will be tested at a selected subnational entity, and the results analyzed. These inputs will be collected into the final deliverable of this activity, a report on metrics, indicators, methodologies and baselines for climate change impacts and adaptation in the Agriculture sector for use at the national and sub-national level.

In addition, this Output is designed to synthesize lessons learned and provide an operational framework for conducting V&A and for the training to be provided under Output 4.1.3.

Proposed activities

Activity 4.1.1 Collect and analyze domestic and international evidence and experiences in impacts, risks and vulnerability assessment and M&E of adaptation actions in the Agriculture sector as well as existing metrics, indicators and methodologies of the Agriculture sector, on a national and sub-national level

? Deliverable 4.1.A: Summary report on relevant data and information regarding climate change impacts and M&E of adaptation in Agriculture, as well as existing and proposed metrics, indicators and methodologies

Activity 4.1.2 Develop metrics, indicators and methodologies in accordance with the NAP and the general practices of the Agriculture sector, including monitoring and evaluation practices at national and sub-national level, and the development of the baseline of indicators for evaluation

? Deliverable 4.1.B: Report on draft metrics, indicators, methodologies and baselines for climate change impacts and adaptation in the Agriculture sector for use at the national and subnational level

Activity 4.1.3 Take stock of current institutional arrangements for reporting, monitoring and evaluation of adaptation actions in the Agriculture sector, including procedures and processes of involved agencies and ministries, and establish and formalize institutional arrangements, outlining reporting responsibilities

? Deliverable 4.1.C: Report on current institutional arrangements for adaptation tracking in the Agriculture sector

The output and the related deliverables as well as all the other outputs of this component shall be adopted by the Ministry of Agriculture and Cooperatives, which is the lead agency responsible for adaptation activities of this sector. The Office of Agriculture Economics is the key institution involved in Component 4 and will pursue for the adoption of the outputs at ministry level through the ministry's internal procedural approach with the potential of assigning a dedicated working or committee to oversee the activities of this component.

Output 4.2 Templates for a national information gateway on climate risk, vulnerability and adaptation to monitoring and evaluation adaptation action in the Agriculture sector developed and disseminated

Information relevant to vulnerability and adaptation tends to be generated with a sectoral view, resulting in various datasets with different structures and standards. The standardization of the various sources of data on vulnerability and adaptation has been highlighted as a barrier throughout the NAP process. A related matter is the interoperability of climate-related databases which means to integrate different autonomous data collection, so that search queries can be resolved by searching all databases simultaneously. The standardization and interoperability of all relevant databases is a significant challenge and requires a baseline analysis and proposed mechanisms to overcome this. This output will include a consultation to obtain feedbacks on the template of reporting, monitoring and evaluation of climate change adaptation in the Agriculture sector. Activities under this Output aim to provide a template for reporting monitoring and evaluation, which is applicable adaptable for different databases under the Agriculture sector and a reporting database ? a national information gateway ? on monitoring and evaluation. The template and database will be complemented with guidelines on the use of the templates and database. The national information gateway will be a web-based platform to collect M&E data on the adaptation actions. The setting of this will be similar to the deliverable of component 3, whereby the audiences could be classified into at least 2 tiers ? for the admin to input the data and adjust the raw data, and for the wider public and donors to see the data and analysis. However, as Thailand still has no platform for adaptation action, this will be the first initiative for the country. Therefore, this national information gateway aims to start from the adaptation action in agriculture sector first. Subsequently the blueprint for M&E template development will be extended to other sectors under the NAP project which too will be executed by the ONEP

Proposed activities

Activity 4.2.1 Develop the template for reporting on performance, and monitoring and evaluation, of adaptation activities in the Agriculture sector according to the NAP and climate change strategies/plans/measures for agricultural sector, as well as the framework under the Paris Agreement

? Deliverable 4.2.A: Template for reporting, monitoring and evaluation of climate change impacts and adaptation in the Agriculture sector

Activity 4.2.2 Develop a reporting database ? a national information gateway ? for performance, monitoring and evaluation of adaptation actions in the Agriculture sector

Activity 4.2.3 Test the reporting database for performance, monitoring and evaluation of adaptation actions in a selected agency in the Agricultural sector, and assess the results

Activity 4.2.4 Publish reporting database of monitoring and evaluation of climate change impacts and adaptation in the Agriculture and disseminate to related agencies

? Deliverable 4.2.B, resulting from activities 4.2.2, 4.2.3 and 4.2.4: Reporting database for monitoring and evaluation of climate change impacts and adaptation in the Agriculture sector, including the results from beta testing, for relevant agencies.

Activity 4.2.5 Develop Guidelines for reporting, monitoring and evaluation of adaptation actions in the Agricultural sector

? Deliverable 4.2.C: Guidelines and methodological framework for reporting, monitoring and evaluation of climate change impacts and adaptation in the Agriculture sector

All deliverables under this output shall be adopted by the Ministry of Agriculture and Cooperatives, as the lead agency responsible for adaptation activities of this sector.

Output 4.3 Capacity building on integrating information and knowledge on impacts, risks and vulnerability from climate change into policy formulation, and on monitoring and evaluation of adaptation activities strengthened in the Agricultural sector

Knowledge and awareness have been identified as constraints for implementation in the NAP process. Mainstreaming basic mechanisms for transparency in adaptation require significant human and institutional capacities, including on the use of data on risk, vulnerability and adaptation and their effective integration in the policy cycle. A training curriculum to be designed within this output will focus on the integration of climate change impacts, risks and vulnerabilities and adaptation into policies and plans in the Agriculture sector. The training will be used for human resource development for officials under central and local agencies. The contents will be revisited periodically as needed.

Proposed activities

Activity 4.3.1 Analyze practices for applying information and knowledge on impacts, risks and vulnerabilities from climate change in policy formulation in the Agriculture sector

Activity 4.3.2 Develop training curriculum, integrating relevant climate change and V&A knowledge, for the Ministry of Agriculture and Cooperatives, following Activity 4.3.1

? Deliverable 4.3.A, resulting from activities 4.3.1 and 4.3.2: Report on relevant knowledge in the collection, reporting and policy planning use of climate change vulnerability and adaptation (V&A) information in the Agriculture sector and training curriculum for policy mainstreaming

Activity 4.3.3 Provide training to relevant agencies in integrating adaptation issues in climate change plans/measures/strategies following the Activities 4.3.1 and 4.3.2

? Deliverable 4.3.B: Training workshop, workshop report and training materials for relevant agencies

Activity 4.3.4 Provide training to relevant agencies on the use of the reporting database (under Output 4.2) following the guidelines developed under Activity 4.2.5

? Deliverable 4.3.C: Training workshop report, training materials and user manual for the reporting database

All deliverables under this Output shall be adopted by the Ministry of Agriculture and Cooperatives, as the lead agency responsible for adaptation activities of this sector.

4) Alignment with GEF Focal Area and/or Impact Program strategies

This CBIT project addresses the GEF Focal Area Climate Mitigation 3-8 *‘Foster enabling conditions for mainstreaming mitigation concerns into sustainable development strategies through capacity building initiative for transparency?’.*

The GEF-7 Climate Change Focal Area Strategy aims to support developing countries in undertaking transformational changes towards low-emission and climate-resilient development pathways. The Capacity building Initiative for Transparency, as per COP decision[47]⁴⁷ of the 21st session of the COP, complies with this Focal Area Strategy by:

- ? Strengthening national institutions for transparency-related activities in line with national priorities;
- ? Providing relevant tools, training and assistance for meeting the provisions stipulated in Article 13 of the Agreement; and
- ? Assisting in the improvement of transparency over time.

The project addresses the need for enabling conditions to mainstream climate change concerns into the national planning and development agenda through its support for enabling activities, including obligations of the Convention and the Capacity building Initiative for Transparency through sound data, analysis, and policy frameworks. The four different components of this project are well aligned with the transparency-related activities of the Proposed Programming Priorities specified under paragraph 18 (national level) in the CBIT Programming Directions (GEF/C50/06)[48]⁴⁸. The alignment of the specific project outputs with the CBIT Programming Directions is specified below.

Output 1.1: Activities to strengthen national institutions for transparency-related activities in line with national priorities, (a) Support to national institutions to lead, plan, coordinate, implement, monitor, 4 and evaluate policies, strategies, and programs to enhance transparency, including identification and dissemination of best/good practices for institutional strengthening and national network of practitioners; (c) Assistance with deployment and enhancement of information and knowledge management structure to meet Article 13 needs.

Output 1.2: Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13 (d) Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets, and database system tools and economic models needed for implementation of enhanced transparency-related activities; (e) Country-specific training and peer exchange programs on transparency activities, such as establishing domestic MRV systems, tracking nationally determined contributions (NDCs), enhancement of greenhouse gas (GHG) inventories and economic and emissions projections, including methodological approaches, data collection, and data management, and adaptation monitoring, evaluation, and communication measures.

Output 1.3: Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (f) Development of country-specific emissions factors and activity data.

Output 1.4: Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (d) Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets, and database system tools and economic models needed for implementation of enhanced transparency-related activities; (e) Country-specific training and peer exchange programs on transparency activities, such as establishing domestic MRV systems, tracking nationally determined contributions (NDCs), enhancement of greenhouse gas (GHG) inventories and economic and emissions projections, including methodological approaches, data collection, and data management, and adaptation monitoring, evaluation, and communication measures.

Output 2.1: Activities to strengthen national institutions for transparency-related activities in line with national priorities: (a) Support to national institutions to lead, plan, coordinate, implement, monitor, and evaluate policies, strategies, and programs to enhance transparency, including identification and dissemination of best/good practices for institutional strengthening and national network of practitioners; (c) Assistance with deployment and enhancement of information and knowledge management structure to meet Article 13 needs.

Output 2.2: Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (g) Assistance in quantifying and reporting impact of policy measures.

Output 2.3: Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (d) Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets, and database system tools and economic models needed for

implementation of enhanced transparency-related activities; (g) Assistance in quantifying and reporting impact of policy measures.

Output 3.1: 1) Activities to strengthen national institutions for transparency-related activities in line with national priorities: (a) Support to national institutions to lead, plan, coordinate, implement, monitor, and evaluate policies, strategies, and programs to enhance transparency, including identification and dissemination of best/good practices for institutional strengthening and national network of practitioners; (c) Assistance with deployment and enhancement of information and knowledge management structure to meet Article 13 needs; and 2) Activities to assist with improvement of transparency over time: (j) Capacity needs assessment for transparency, in particular to assess institutional arrangements for data collection, analysis, and reporting: the assessment supports mapping of current baseline and planned reporting and related activities, including associated institutions, tools, methodologies, MRV systems, associated data systems.

Output 3.2: Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (i) Assistance in quantifying and reporting on support provided and received.

Output 4.1: 1) Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (d) Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets, and database system tools and economic models needed for implementation of enhanced transparency-related activities, (e) Country-specific training and peer exchange programs on transparency activities, such as establishing domestic MRV systems, tracking nationally determined contributions (NDCs), enhancement of greenhouse gas (GHG) inventories and economic and emissions projections, including methodological approaches, data collection, and data management, and adaptation monitoring, evaluation, and communication measures;

Output 4.2: 1) Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (d) Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets, and database system tools and economic models needed for implementation of enhanced transparency-related activities, (e) Country-specific training and peer exchange programs on transparency activities, such as establishing domestic MRV systems, tracking nationally determined contributions (NDCs), enhancement of greenhouse gas (GHG) inventories and economic and emissions projections, including methodological approaches, data collection, and data management, and adaptation monitoring, evaluation, and communication measures; and 2) Activities to assist with improvement of transparency over time: (j) Capacity needs assessment for transparency, in particular to assess institutional arrangements for data collection, analysis, and reporting: the

assessment supports mapping of current baseline and planned reporting and related activities, institutions, tools, methodologies, MRV systems, associated data systems.

Output 4.3: 1) Activities to strengthen national institutions for transparency-related activities in line with national priorities: (a) Support to national institutions to lead, plan, coordinate, implement, monitor, 4 and evaluate policies, strategies, and programs to enhance transparency, including identification and dissemination of best/good practices for institutional strengthening and national network of practitioners; (b) Support on how to integrate knowledge from transparency initiatives into national policy and decision-making; (c) Assistance with deployment and enhancement of information and knowledge management structure to meet Article 13 needs. 2) Activities to provide relevant tools, training, and assistance for meeting the provisions stipulated in Article 13: (d) Access to tools, templates, and applications to facilitate the use of improved methodologies, guidelines, datasets, and database system tools and economic models needed for implementation of enhanced transparency-related activities; (e) Country-specific training and peer exchange programs on transparency activities, such as establishing domestic MRV systems, tracking nationally determined contributions (NDCs), enhancement of greenhouse gas (GHG) inventories and economic and emissions projections, including methodological approaches, data collection, and data management, and adaptation monitoring, evaluation, and communication measures.

5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

Thailand places great importance on the global efforts towards addressing climate change and will continue to play a constructive role in the UNFCCC process. The country's efforts towards transparency of its GHG emissions and climate actions have been demonstrated with the preparation of two BURs and three NCs.

However, the newly established Enhanced Transparency Framework poses a great challenge to countries requiring them to significantly enhance their transparency systems as a whole, including transparency of mitigation and adaptation actions as well as support needed and received, requiring countries to significantly enhance their coordination mechanisms at the central government level but also at the subnational level. Building on the activities and outcomes of Thailand's BUR and NC processes, this project will establish formalized and permanent institutional arrangements for GHG data collection and reporting as well as tracking of mitigation adaptation actions in the AFOLU sector, and will provide the necessary methodologies and tools to improve data collection and quality.

Thailand receives considerable support in the area of GHG inventory, MRV of mitigation and transparency supported related to adaptation. The GIZ in particular is one of the largest support providers in this field and aids through NAP and NAMA projects as well as through the comprehensive Thai German Climate Programme. Also, other organizations are very active in this field, for instance UNDP through its NDC Support Programme and GGGI through its NDC-related support in the Industry sector. The Energy sector has generally received more support than the other sectors in the Thai context.

Mindful of the existing support transparency programmes in Thailand, the CBIT project overcomes sectoral gaps by focusing on the AFOLU sector and is targeted towards addressing the barriers, gaps and needs identified in the BUR, NC and ICA processes, such as the need for developing country-specific emission factors and establishing a QA/QC system for certain sectors. The need for improved data collection processes from the various agencies involved in the GHG inventory process in the AFOLU sector will be addressed through this CBIT project, specifically through data-sharing agreements and sectoral templates and guidelines. Thailand has established the Greenhouse Gas Emissions Inventory System but requires support in advancing the supporting structures for data collection and reporting, notably institutional arrangements. In addition, there are no templates or guidelines available for line ministries on how to collect activity data, and guidelines for the sectorial lead agencies to assess the quality of data collected and provided by their line ministries are also lacking. This represents a significant gap in Thailand's transparency system and a barrier to enable the full functionality of the TGEIS which will be addressed through this CBIT project in the AFOLU sector. Furthermore, this project will support Thailand in fully transitioning towards the 2006 IPCC Guidelines, as the recent inventories were based on 1996 Revised IPCC Guidelines, and help to enhance the tracking of climate support received, by building on a newly established system by ONEP. This CBIT project will support Thailand in advancing monitoring and evaluation for adaptation within Agriculture, as a priority adaptation sector in its NDC and the Climate Change Master Plan.

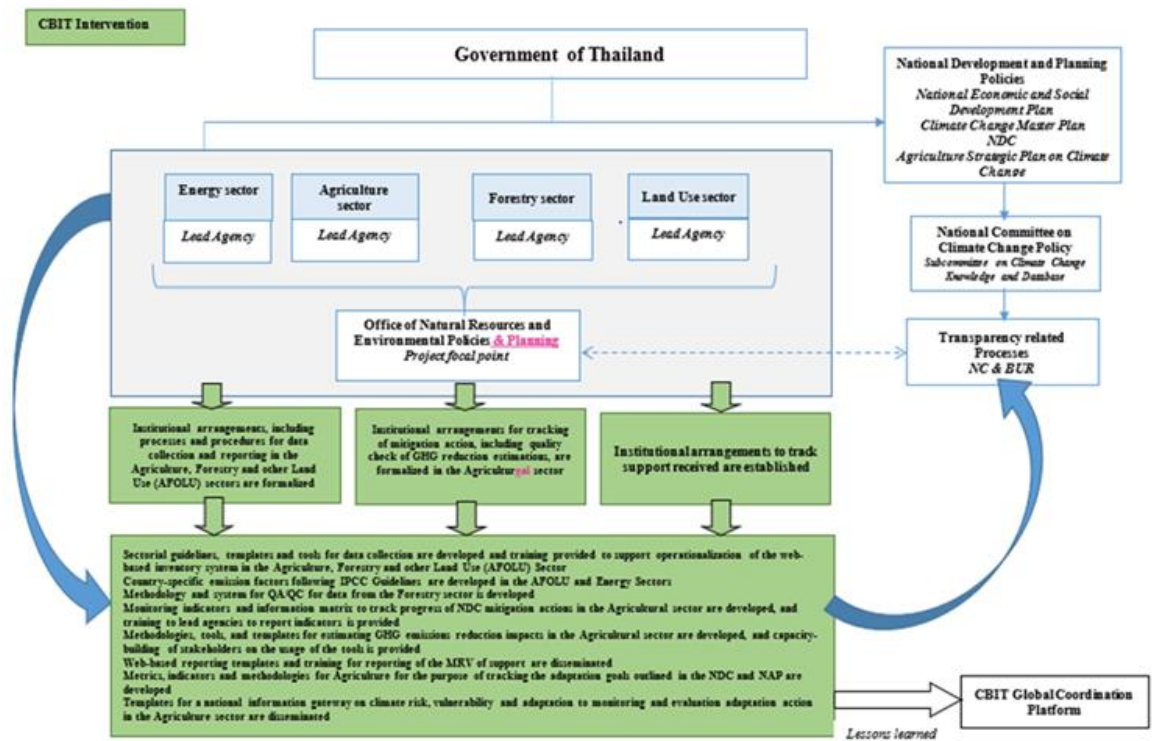
The outputs of the project will allow Thailand to develop and enhance its transparency system in line with the requirements of the Enhanced Transparency Framework. Enhancing data quality and strengthening capacities to monitor progress are preconditions for the effective implementation of climate actions. Although Thailand's NDC mitigation component does not encompass the AFOLU sector, Thailand is exploring the inclusion of mitigation actions in the Agriculture sector in its second NDC, due in 2025. In addition, relevant agencies in various sectors are now in the process of formulating specific sectoral plans to address climate change including concrete mitigation and adaptation activities which can be supported by establishing an improved transparency system in the country. The outputs and deliverables of the CBIT project will be integrated into governmental processes and several of the deliverables will be presented to the National Committee on Climate Change Policy, which is chaired by Thailand's Prime Minister.

Without the resources from this project, Thailand's technical and institutional capacities will remain insufficient to fulfill the transparency provisions of the Paris Agreement, notably to present an accurate GHG inventory on a biennial basis. Most importantly, the project will enable the country to expand the scope of its NDC to also include the AFOLU sector in its second NDC. Moving towards an economy-wide emission reduction target is also called for by the Paris Agreement.

The CBIT intervention in Thailand is illustrated more specifically in Figure 1.

Figure 1. Schematic representation of the CBIT Thailand interventions

Figure 1. Schematic representation of the CBIT Thailand interventions



The GEF CBIT program is designed to improve mandatory reporting of signatories of the UNFCCC. As such, this project is financed on fully agreed cost basis, and no co-finance is needed. In the case of this program, eligible activities have been described in the GEF document Programming directions for the Capacity Building Initiative for Transparency (GEF/C.50/06). The activities of this project are consistent with the scope of the programming directions. Co-financing is not a necessary requirement for a CBIT project, however the Kingdom of Thailand through the Office of Natural Resources and Environmental Policy will contribute to the project with an in-kind co-financing of US\$ 1,000,000, as has been included in table B and C. Also, other key stakeholders involved in this project are anticipated to provide co-financing. At the time of this proposal, co-financing letters from the respective agencies are being prepared.

6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

Global environmental benefits from this project will stem from its support to the implementation of Thailand's mitigation and adaptation actions in the AFOLU sector, and the potential in enhancing and widening the scope of Thailand's second NDC. This project will strengthen institutional arrangements for transparency in the AFOLU sector and will enhance the quality and accuracy of Thailand's GHG inventory through sectorial templates in LULUCF, country-specific emission factors for Agricultural Soils, Manure Management and selected fuels as well as a QA/QC system for the Forestry sector, the country's fourth largest source of GHG emissions.

The project's support in advancing monitoring and evaluation of adaptation actions in the Agriculture sector, on the national and sub-national level, will improve the planning, assessment and ultimately the effectiveness of adaptation in that sector. The Agriculture sector, as a major economic sector in Thailand, employs roughly one third of the work force, including many smallholder farmers, and is heavily affected by climate change impacts. Fostering adaptation actions in this sector is therefore a priority in the Thai context. The advancement of transparency of international support received under Outcome 3 of this project will equally support improved planning and assessment of international support for climate change. Tracking information on what kind of funding is being provided for which thematic area by which donor enables Thailand to strategically plan its available funding as well as future funding streams.

The implementation of mitigation actions will not only result in GHG emissions reduction but will also bring about a variety of environmental and social co-benefits, not the least a decrease in air pollution. Specifically, an improved tracking of progress in interventions towards the reduction of open burning of agricultural biomass (component 2) could contribute to improving the air quality all key agricultural provinces as well as in Bangkok, where the practice crucially contributes to particulate matter pollution (Phairuang et al., 2019). In fact, open burning is associated to a doubling of overall air pollution in the whole country, with monthly averages of the months with the agricultural burning being higher by around 1.9-2.1 times than the rest of the months (Junpen, Pansuk, Kamnoet, Cheewaphongphan, & Garivait, 2018). Air pollution, mainly from inhalable particulate matter, Nitrous and Sulphur oxides, and tropospheric ozone, is associated with a large burden of disease and premature mortality in Thailand (Guo et al., 2015), in turn representing significant economic costs at the societal level in Thailand and beyond, for a significant proportion of air pollutants contributes to transboundary pollution. Conversely, due to the high proportion of black and elemental carbon of PM from agricultural residue burning, a reduction of open burning would also contribute to comparative reductions in Thailand's emissions of short-lived climate pollutants. As such, a reduction in open burning activities, through enhanced monitoring, will also contribute towards air pollution related

SDG indicators. The burning of agricultural residues also has adverse impacts on soil quality and drought resistance with negative impacts reducing agricultural yields and livelihoods.

Monitoring of climate actions is a precondition to make necessary adjustments and enhance ambition

over time. As Thailand considers the integration of mitigation actions from the Agriculture sector in its second NDC in 2025, the project will lay the basis for such an integration and thus an expansion of Thailand's NDC. This is also in line with the Paris Agreement, encouraging developing country Parties to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances (UNFCCC 2015, p.3, para 4). National transparency activities are also important in a global context as tracking progress in the implementation of mitigation actions and adaptation actions as well as of support received will also inform the Global Stock Take, with a view to enhance the global response to climate change in line with the long-term temperature goals, as well as the global goal on adaptation.

7) Innovativeness, sustainability and potential for scaling up

Innovativeness:

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The innovation potential of this project is manifold. Firstly, the formalization of Thailand's institutional arrangements for transparency in the AFOLU sectors is innovative in a context where so far, such arrangements have largely been *ad hoc*, for the purpose of preparing BURs and NCs. The elaboration of data-sharing agreements and institutional mandates will improve communication and coordination among different agencies and will ensure greater involvement of the AFOLU sector in transparency work implementation of mitigation actions in general. In addition, the large-scale use of aerial photography and satellite data under standardized procedures represents a significant innovation at the local level in comparison to the baseline, with the scattered use of scarcely comparable data sources. Equally, the development of an emission factor for selected fuels in the Energy sector will be innovative as so far solely default emission factors have been used for GHG estimations from all activities within the Energy sector.

The development of standardized templates, guidelines and tools for line agencies involved in AFOLU and in adaptation within agriculture is a new activity as so far, no such templates and guidelines exist, i.e. guidelines for line ministries on how to collect data and guidelines for lead agencies to assess the

quality of data. Streamlining and standardizing collection of GHG data from the different sectors will be an innovative building block of this project and will facilitate the functioning of Thailand's Greenhouse Gas Emission Inventory System, the first GHG database system in Thailand. Moreover, the support towards the system for tracking international support received, in the form of development of web-based templates to complete, is innovative in the Thai context as so far there has been no mechanism to track such support. The development of a full set of operational climate risk, vulnerability or adaptive capacity indicators in the Agriculture sector as well as a template for a national information gateway on climate risk, vulnerability and adaptation for standardized reporting are equally innovative and will both enhance the quality and consistency of data.

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Sustainability:

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A key factor for the sustainability of the outcomes of this CBIT project is to ensure adequate human and technical resources in the government to operate the system for collecting information, analyzing data and preparing the necessary reports. Capacity-building activities for existing and new staff will be provided in order to address the problem of staff turnover in the institutions, for instance under the Outputs 1.1.2 and 3.1.2

To ensure a continuity in the capacity of government stakeholders and to also train new human resources, national universities will be engaged in the training of the line ministries and relevant government agencies under different outputs of the project. Universities are generally established and stable national institutions with vast experience in research and teaching and are thus well-equipped to deliver transparency-related activities during the implementation period of the project and beyond. Involvement of national academic institutions does also increase the ownership of the project, beyond governmental agencies. Specifically, Kasetsart University (KU) will be engaged in the measurements and development of the emission factor for selected fuels in the Energy sector under Output 1.1.3, thus embedding the protocols and methodologies into a teaching institution and multiplying the capacity building potential. In addition, Chiang Mai University (CMU) will be a key partner for the implementation of the whole of Component 4, thus building research capacity as well as locally generated evaluation knowledge. The involvement of the Chiang Mai University also helps to increase the geographical balance of project activities, as most project stakeholders, notably government agencies, are based in Bangkok, the capital of Thailand. This particularly relevant for adaptation-related activities (in the Agriculture sector) which are often more localized activities. This project will also anchor local capacity in existing institutions within the country. The project will engage experts based in national institutions for training and also identify arrangements for enabling backstopping of government capacity. The development of guidelines and templates in collaboration with national and/or regional experts with a view to reflect the unique needs and characteristics of GHG emissions accounting and reduction tracking in AFOLU will contribute to creating long-term capacity.

Overall, the outputs of this CBIT project will be integrated into or will build on government systems and processes which will ensure the sustainability of the outputs beyond the duration of the project. For example, the sectoral guidelines and templates under Output 1.2 will be aligned with and will complement the Thailand Greenhouse Gas Emission Inventory System as well as the country-specific emission factors to be developed under Output 1.3. Equally, this project will build on ONEP's existing system to track international support received and will thus utilize existing structures and systems and develop them further. Most importantly, the CBIT project will establish institutional arrangements in Output 1.1, 2.1 and 3.1 which provide the basis for future GHG inventory preparations, and the tracking of mitigation actions and support received as per the transparency requirements of the Paris Agreement.

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Potential for scaling-up:

The experience gained from data collection, monitoring, stakeholder consultation, data management and documentation will be used to expand activities in a more detailed manner in other climate change mitigation and adaptation priority sectors, at both national and subnational levels. Output 1.1.3 for example can be expanded to improve already existing country-specific emission factors, incorporating the latest science in the respective sectors. Moreover, the detailed development of M&E systems, metrics and capacity in a complex and atomized sector such as agriculture can serve as a learning experience for other sectors. In addition, Thailand attaches great importance to south-south cooperation and is a key provider of capacity building for MRV to other countries. The project outputs and their related capacity built will be used to support other countries in the region, for instance by using the ASEAN-wide channels created as a result of the of the TGO-CITC project, and thereby offer opportunity for scaling up and replicating similar activities in Southeast Asia and beyond. Considering that all countries undergo similar processes of enhancing their transparency systems and capacities, sharing of lessons-learned through different fora and platforms will be an important element of this project. Thailand is for example already engaged in knowledge-sharing activities through the Asian Regional Group of the Partnership for Transparency in the Paris Agreement (PATPA) and also participates in regional climate change and transparency-related activities organized by UNFCCC's Regional Collaboration Centre in Bangkok. Engagement in the CBIT Global Platform and participation in global CBIT meetings for sharing/receiving lessons learned to/from other countries are crucial in that regard. Knowledge-sharing and interaction with the global CBIT-AFOLU project, which is implemented through the FAO, is here of particular importance. While the project is implemented in 13 pilot countries, such as China and Myanmar, the project focuses on the development of tools, guidance, training packages and e-learnings which can be utilized by other countries. The project specifically

states that 'the tools will be disseminated to a wider audience of countries and transparency practitioners[49]⁴⁹.

[1] There is a change in Component 2, see following page

[2] While developing country Parties were in theory also required to submit their Biennial Update Reports every two years from 2014 onwards, in practice only few countries did so. So far only 31 and 10 developing countries submitted their second and third BUR respectively.

[3] Germanwatch 2019. Global Climate Risk Index 2020. Available at:
https://www.germanwatch.org/sites/germanwatch.org/files/20-2-01e%20Global%20Climate%20Risk%20Index%202020_14.pdf

[4] <https://climateknowledgeportal.worldbank.org/country/thailand/climate-data-projections>

[5] <https://www.ldeo.columbia.edu/chrr/research/profiles/thailand.html>

[6] https://info.undp.org/docs/pdc/Documents/THA/3771_THA_Annexes.pdf

[7] <http://www.fao.org/3/I8683EN/i8683en.pdf>

[8] <https://reliefweb.int/report/thailand/coronavirus-disease-2019-covid-19-who-thailand-situation-report-21-july-2020>

[9] <https://news.un.org/en/story/2020/08/1069191>

[10] <https://bangkok.unesco.org/content/reporting-climate-change-context-covid-19>

[11] <https://www.bangkokpost.com/opinion/opinion/1938088/recovery-after-covid-19-lets-make-it-green>

[12] <https://thediplomat.com/2020/04/thailand-confronts-its-triple-disaster-in-2020//>

[13] <https://thediplomat.com/2020/04/thailand-confronts-its-triple-disaster-in-2020//>

[14] <https://www.undp.org/content/dam/thailand/docs/UNDP%20Thailand%20COVID-19%20Brochure.pdf>

[15] <https://www.adaptationcommunity.net/wp-content/uploads/2019/04/giz2019-en-factsheet-nap-thailand-low-res.pdf>

[16] World Bank Group

- [17] Food and Agriculture Organization of the United Nations
- [18] <http://documents1.worldbank.org/curated/en/723821601519046290/pdf/Thailand-Thailand-HCFC-Phase-out-Project.pdf>
- [19] United Nations Development Programme
- [20] <https://www.iea.org/articles/putting-a-price-on-carbon-an-efficient-way-for-thailand-to-meet-its-bold-emission-target>
- [21] Federal Ministry of the Environment, Nature Conservation and Nuclear Safety
- [22] Deutsche Gesellschaft für Internationale Zusammenarbeit
- [23] https://iiasa.ac.at/web/home/research/researchPrograms/air/7_Haze_WS_Savitri_Garivait.pdf
- [24] Global Green Growth Institute
- [25] International Climate Initiative
- [26] https://www.thai-german-cooperation.info/en_US/thailand-plans-to-enhance-transparency-of-ghg-emission-reporting-through-improved-quality-control-process/
- [27] Japan International Cooperation Agency
- [28] Integrating Agriculture in National Adaptation Plans (NAP-Ag) Programme Case study Thailand: https://www.adaptation-undp.org/sites/default/files/resources/thailand_case_study_.pdf
- [29] United Nations Office of Project Services
- [30] European Union
- [31] Good Governance for Social Development and the Environment Institute
- [32] Swedish International Development Cooperation Agency
- [33] Integrating Agriculture in National Adaptation Plans (NAP-Ag) Programme Case study Thailand: https://www.adaptation-undp.org/sites/default/files/resources/thailand_case_study_.pdf
- [34] Presentation by Ms. Ratana Lukanawarakul, Department of National Parks, Wildlife and Plant Conservation at the workshop of the Asia-Pacific Regional Group of the Partnership for Transparency in the Paris Agreement (PATPA), 24-26 April 2019. Available at: <https://www.transparency->

partnership.net/system/files/document/24042019_AFOLU_Tracking%20Progress%20NDC_Thailand_0.pdf

[35] Presentation by Mr. Sivach Kaewcharoen on 1 August 2019

http://www-gio.nies.go.jp/wgia/wg17/pdf/4-3_Session_4_Thailand.pdf

[36] Paris Agreement Art. 4 para 13: "*In accounting for anthropogenic emissions and removals corresponding to their nationally determined contributions, Parties shall promote environmental integrity, transparency, accuracy, completeness, comparability and consistency, and ensure the avoidance of double counting, in accordance with guidance adopted by the Conference of the Parties serving as the meeting of the Parties to this Agreement.*"

[37] Agriculture contributes approximately 17% to Thailand's total GHG emissions, based on CAIT
<https://www.climatewatchdata.org/countries/THA>

[38] <https://www.transparency-partnership.net/news/tracking-progress-implementing-ndcs-asia>

[39] <https://ccacoalition.org/en/resources/air-pollution-asia-and-pacific-science-based-solutions-summary-full-report>

[40] <https://ccacoalition.org/en/activity/open-agricultural-burning>

[41] https://iiasa.ac.at/web/home/research/researchPrograms/air/7_Haze_WS_Savitri_Garivait.pdf

[42] By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

[43] By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

[44] <https://www.adaptationcommunity.net/wp-content/uploads/2019/04/giz2019-en-factsheet-nap-thailand-low-res.pdf>

[45] https://www.slideshare.net/NAP_Global_Network/thailand-nap-me-framework-kollawat-sakhakara-monre

[46] https://reliefweb.int/sites/reliefweb.int/files/resources/thailand_case_study_.pdf

[47] FCCC/CP/2015/L.9/Rev.1, para 85, available at
<https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>

[48] Available at: https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.50.06_CBIT_Programming_Directions_0.pdf ah

[49] <https://www.transparency-partnership.net/news/building-capacity-support-countries-fulfil-reporting-requirements>

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

The project will take place within the borders of the Kingdom of Thailand (illustrated in Figure 2) and seeks to achieve positive impacts in the entire country. As a country in Southeast Asia, Thailand is located latitude 15.8700323 and longitude 100.9925385[1] The table below provides geographical coordinates of the location of key stakeholders involved in this project, as does Annex E.

Figure 2. Map of Thailand



Source: Department of Field Support Cartographic Section UNITED NATIONS



Source: Department of Field Support Cartographic Section UNITED NATIONS

Table 7. Geographical coordinates of key stakeholders involved in the project

Name of Key Stakeholders	Geographical Coordinates
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Office of Natural Resources and Environmental Policy & Planning (ONEP)	Bangkok 13.783544 N, 100.536416 E http://www.onep.go.th/
Department of Alternative Energy Development and Efficiency (DEDE)	Bangkok 13.749580 N, 100.517566 E http://www.dede.go.th/
Office of Agricultural Economics (OAE)	Bangkok 13.845198 N, 100.573981 E http://www.oae.go.th/view/1/Home/EN-US
Land Development Department (LDD)	Bangkok 13.838258 N, 100.574474 E http://www.ddd.go.th/ddd_en/
Department of Livestock Development (DLD)	Bangkok 13.755851 N, 100.533851 E http://en.dld.go.th/index.php/en/home-top
Geo-Informatics and Space Technology Development Agency (GISTDA)	Bangkok 13.882891 N, 100.564405 E https://www.gistda.or.th/main/en

[1] Source: <https://www.geodatos.net/en/coordinates/thailand>

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations

Indigenous Peoples and Local Communities

Private Sector Entities

If none of the above, please explain why: Yes

The project design discussions were led by the Office of Natural Resources and Environmental Policy and Planning (ONEP) team, which is the lead agency responsible for reporting to UNFCCC. ONEP consulted in total, there were 13 relevant public agencies that have been participated in the bilateral consultation sessions during 18 February ? 6 March 2020. The agencies contacted were those that within the government mandate are responsible for reporting on the GHG inventory and climate change actions. The CSOs and private sector would be engaged in the project implementation stage through technical working groups. A validation workshop was organized to validate the project design was organized on 11th September 2020, where all the key public agencies that will participate in the project were present.

Please provide the Stakeholder Engagement Plan or equivalent assessment.

The main stakeholders for this project, their contributions and expected roles are specified in Table 8 below.

Table 8. Stakeholders and contributions to the project

Stakeholder Main Group	Stakeholder Name	Existing activities with potential to be leveraged	Content engagement, contributions to the project (identified by Component or Output)
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Government	Office of Natural Resources and Environmental Policy and Planning (ONEP)	The Office of Natural Resources and Environmental Policy & Planning provides information about policies and regulations on conservation and management of natural resources and the environment. ONEP is the national climate change focal point to the UNFCCC.	<p>Components 1, 2, 3 and 4. Responsible for the overall coordination of all activities defined in this project, for ensuring communication with other key stakeholders, as well as the co-financing (in-kind contribution) from the government of Thailand. ONEP will further oversee the activities of the Project Management Unit of the CBIT project. ONEP will carry out a process to identify a third-party entity which will manage the funds and conduct procurement, on behalf of ONEP.</p> <p>For Component 3, in particular, ONEP will be responsible to all Outputs contributed to the systems and tools to effectively track international support received and report transparently as per international obligation (Outcome 3.1).</p>
Government	Department of Alternative Energy Development and Efficiency (DEDE)	The Department of Alternative Energy Development and Efficiency is responsible for, among others, energy efficiency promotion, energy conservation regulation, energy sources provision and alternative development of integrated energy uses. DEDE has also been responsible for the establishment of national fuel specific properties.	Component 1. Responsible for the estimation of the Emission Factor for the energy sector (under Output 1.1.3), with an objective to verify and update the data on (i) Carbon content, and (ii) Net Calorific Value (NCV) to support for the EF for the energy sector which have been used for 10-30 years ago.

Government	Office of Agricultural Economics (OAE)	The Office of Agricultural Economics is Thailand's lead organization in developing and formulating agricultural strategies, providing agricultural data and information services, conducting research and preparing reports on the agricultural economic situations as well as monitoring of projects undertaken by the Ministry of Agriculture.	<p>Components 1 and 2. Responsible for supervising the project of developing methodologies for MRV for estimating changes in soil carbon (under Output 1.1.3), and developing methodologies, tools and templates for estimating GHG emissions from the agricultural sector (open burning measure) (Component 2).</p> <p>Component 4. As a policy body under the Ministry of Agriculture and Cooperatives, OAE will be responsible for all Outputs under this Component to ensure Thailand has the tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development (Outcome 4.1).</p>
Government	Land Development Department (LDD)	The Land Development Department has the duty to conduct soil surveys and analyses as a basis for establishing land classification and utilization maps, land development, and to define land use areas, and soil and water conservation areas according to a land census. It is further responsible for the collection of statistics as a basis for conducting land censuses.	<p>Components 1 and 2. Responsible for the development of country-specific emission factor for soil carbon emission (under Output 1.1.3) and methodology for estimating open burning reduction (Component 2)</p>

Government	Department of Livestock Development (DLD)	The Department of Livestock Development is responsible for the development of knowledge, resources and expertise in the livestock sector. DLD has had ongoing activity funded by the country's national budget	Component 1. Responsible for the development of the relevant dataset for the development of a country-specific emission factor for manure management (Output 1.1.3)
Public Organisation	Geo-Informatics and Space Technology Development Agency (GISTDA)	The Geo-Informatics and Space Technology Development Agency is responsible for developing geo-informatics and space technology as a non-boundary knowledge for the country development.	Component 1. GISTDA will serve as a central agency responsible for the assignments and work jointly with DNP, LDD and DLD on the aerial photography and satellite image interpretation for the identification of forestry and non-forestry areas.
National Universities	Kasetsart University (KU)	The team at the Faculty of Engineering at Kasetsart University, have been conducting analyses of energy data, especially on fuels used and carbon footprint for the past several years, with experienced team members, private sector connections and a fuel database.	Component 1. Provide technical expertise in assisting DEDE for the development of the Emission Factors for energy sector (under Output 1.1.3).
National Universities	Chiang Mai University (CMU)	The Faculty of Agriculture of Chiang Mai University has vast experience which have been referenced in several studies. Recently the Risk-NAP project has also involved an expert from CMU to work of the issues related to agricultural sector including vulnerabilities, risks, food securities, etc.	Component 4. Provide technical expertise to work with OAE in the development of all Outputs under Component 4.

Government	Office of Women's Affairs and Family Development (OWAFD), Ministry of Social Development and Human Security	The project will result in data collection that goes into policy making and the development of programmes. This stakeholder will also contribute to ensuring equal benefits to all genders and groups and minimizing potential negative impacts on women. Having a representative from Ministry will help get inputs to ensure that these concerns are addressed.	Component 3 Provide review inputs and support finalization of gender mainstreaming plan and gender considerations Components 1,2,3, 4 ensuring equal benefits to all genders and groups and minimizing potential negative impacts on women. Representative will participate in the relevant meetings and trainings to support integration of gender aspects in project outputs.
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In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

ONEP officially engaged each of the involved government agencies through the project validation workshop, during the course of this CEO Endorsement Document development, in order to confirm a mutual understanding on roles and responsibilities of each entity under Thailand CBIT project. It held extensive consultations with stakeholders, involving 13 relevant public agencies during the period from 18 February ? 6 March 2020. Each stakeholder expressed their concerns, priorities for the project and information on ongoing and upcoming complementary activities to promote synergies and avoid overlaps. Below is a short summary of their views and priorities:

Land Development Department

- The aim is to develop ?Soil carbon emission map? to establish the baseline of soil inventory covering entire country, which at the moment is still absent from current Thailand?s NDC
- LDD proposed ?the pilot mitigation actions in agricultural sector?, as this type of mitigation activities is still absent from the current Thailand?s NDC
- LDD also proposed to develop ?the sensitive area map? as a warning system for the Thai farmers, since these natural disasters.

Department of National Park, Wildlife and Plant Conservation

- Since manual-recorded statistical data is highly uncertain, DNP aims to focus on the area of forest according to the REDD+ definition. In order to avoid confusion of 'Forest' in this project, definitions should be clearly explained. DNP proposed they could cover the forest area (under REDD+), while non-forest could be performed by GISTDA (Geo-Informatics and Space Technology Development Agency) and/or LDD.
- The work is to focus on methodology development and capacity building of DNP staff to perform necessary steps to undertake emission factor (EF) determination, rather than actual implementation of EF development since the practices could be time and resource consuming.
- DNP already conducted their QA/QC process. With this, they are interested to receive the support from this CBIT project for development of the formal QA/QC manual, considered DNP current practice coupled with international methods.
- DNP suggested to develop the reporting system as the internet-based form, which will also be pursued for the possibility during the implementation of this project.

Geo-Informatics and Space Technology Development Agency

- As proposed by the DNP, GISTDA is willing to support and work jointly on the interpretation of such non-forest area out of the REDD+ forest definition. This task is expected to be performed on a yearly basis.
- However, since this is not the mandate of GISTDA, hence GISTDA requested ONEP to hierarchically propose this mandate to the Working Group, Subcommittee, and National Committee on Climate Change to endorse for the GISTDA's mandate on this task, and capable of maintaining this follow up system in long run.

Office of Agricultural Economic

- Enhance comprehensiveness of agricultural data form mainly aims to include the data on fertilizer consumption and the pilot process for data collection on this particular information.
- The OAE expressed the interest in developing the monitoring system of mitigation actions in agricultural sector. However, the measures should be predetermined.
- Methodologies for estimating GHG emission reduction in agricultural sector based from the earlier study, supported by the GIZ, on five potential measures for emission reductions from the mitigation actions, which are (i) Alternate wetting and drying water management irrigated rice field, (ii) Biogas, (iii) Animal feed, (iv) Fertilization, and (v) Open burning reduction.
- OAE aims is to develop the sectoral indicators in the agricultural sector that is consistent with the National Adaptation Plan (NAP), as well as develop the baseline and M&E system. It is noted that there is also the earlier study by the OAE on the national food security as one of the NAP's goal ? included five indicators, which are (i) food adequacy, (ii) food access, (iii) food utilization, (iv) food stability, and (v) food nutrition.

Department of Livestock Development

- DLD is interested in developing EFs for manure managements, which they have learnt that it is best to revise these data every 5-10 years. DLD will find out from other unit if there is additional need to study on Fermentation activities.

- DLD expresses their interest in pilot mitigation activities, i.e. animal food and breeding improvement. It is noted that the GHG management in livestock sector evolves around the issues of manure management, animal feeds and breeding improvement. However, this sector is still not covered in current Thailand's NDC.

Rice Department

- The Rice Department expressed their willingness to provide support to the development of template and reporting system. With this, the OAE will be the key responsible partner.

- The Component 4 focusses on the integration and analyses of necessary data from various sources to inform policy directions. The Rice Department was clearly informed that the project might need support from the Department.

Department of Alternative Energy Development and Efficiency

- The objective of Data Update to enhance Emission Factor calculation for the Energy Sector is to verify and update the data on (i) Carbon content, and (ii) Net Calorific Value (NCV) to support for the EF in the energy sector which have been developed for 10-30 years.

- However, DEDE also expressed the view that in comparison, the inventory of energy sector in Thailand might already be more advanced and have received much more resources and supports, comparing to such other sectors as waste/IPPU/agriculture. Hence, ONEP might consider those sectors with higher priorities under this CBIT project.

Energy Policy and Planning Office

- EPPO proposed MRV systems for EE measures in order to complement and extend the scope of works of MRV systems earlier done by GIZ which cover only for energy label (until November 2020) to other Energy Efficiency measures. The extension might include Building Energy Code (BEC) (as mentioned by EPPO), and other EE measures.

- EPPO also mentioned regarding their wish to conduct the long-term GHG reduction strategy for energy sector to enhance the comprehensive view of all the activities in this sector for the achievement of Thailand's NDC in the long run. Although this proposed activity is seen to be unfit into this CBIT project, ONEP would have it recorded for future opportunities.

Office of Transport and Traffic Policy and Planning

- OTP expressed their interest in updating Emission Factor for Vehicle Type 1, which covers the majority of the vehicles in Thailand and is the most difficult type to get EF. To calculate EF, also need

to classify each type of vehicle further by the type of fuel they use as well. To work on this issue, OTP might need to receive support from DEDE and cooperate with the Pollution Control Department (PCD) for the lab test of each type of vehicle and fuel. The current EF used the data as of 2011; however, the EF for E85 is not available. The rough estimated cost of the last EF estimation (10 years ago) for 10% sampling size is approximately THB30,000 (USD955) per type of vehicle and type of fuel.

State Railway of Thailand

- Currently, Thailand reports the inventory of railway transport based on Tier 1. The meeting discusses on the potential to explore for the estimation of Tier 2 ? specific emission factor for Thailand, which might require more complicated and systematic of data collection and monitoring system of the railway operation of each type of the locomotive engine.

National Housing Authority

- NHA was engaged to provide support in developing consistent template and institutional arrangement in tracking for all the relevant international support. At present, there is one international support received from EU in the form of capacity building (no financial figure known).

Civil Aviation Authority of Thailand

- The Civil Aviation Authority of Thailand (CAAT) informed that there still no need for the support from CBIT at the moment. General facts and findings are noted below.
- Institutional arrangement and web-based platform has already been in place. Data collection and recording are based on ICAO (International Civil Aviation Organization) standard/requirements. It was informed that there will be regulatory requirements for data reporting from aviation sector. Fuel used for international flights has to be reported to ICAO. Thus, the use for domestic flights can be determined.
- Forms, template and training ? To complete TGEIS and fulfill ICAO requirements, all are in place.
- Emission Factor ? CAAT informed that there is only one fuel type and they apply the default value which is acceptable at this point.
- QA/QC ? CAAT informed that the verification procedure has already been embedded in the database.

There will be two approaches in key stakeholder engagement along the project timeframe as follows:

? Strategic Guidance: A Project Steering Committee (PSC) will be set up, comprising of representatives from key involved agencies, as well as other non-governmental entities, as special invitees related to the various areas under this CBIT project. The PSC will be convened at least twice a year.

? Technical cooperation: Technical working groups will be established in the project for all key output areas. Technical staff of related ministries, and technical experts from non-government organizations including CSOs will be invited to technical working group meetings.

? Administrative engagement: ONEP, as the project executing agency, plans to involve an independent, third part to perform the administrative and financial supports for the entire project timeframe. This entity will be responsible for periodic engagement on procurement and financial matters with each and every agency.

Select what role civil society will play in the project:

Consulted only;

Member of Advisory Body; Contractor; No

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor;

Other (Please explain) Yes

The members of CSO will be engaged through the technical working groups established as part of each of the outcomes/outputs as well as in the training programmes. The lead public agency for the output will identify the most relevant CSOs with experience in the field and invite them to participate in the TWGs to support the review and development of outputs.

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

Gender analysis:

In recent years gender equality has improved in Thailand. In particular, a reduction in the proportion of women living in poverty and the education enrolment and completion rates are improved in the country.

Thailand ranks relatively high in terms of gender equality compared to other South East Asian countries.

In a Global Ranking on gender gap issues, Thailand is ranked number 75 out of a total of 153 countries, according to the World Economic Forum's *Global Gender Gap Report 2020*^[1]. The country has seen a notable increase of women in ministerial positions and has according to the report fully closed its gender gap on the technical and professional workers indicators. Despite those improvements, gender gaps still remain present in the country and will therefore also be included in this project. In 2018, the overall Human Development Index (HDI) was 0,765, which means that Thailand is in the high human development category, and the female HDI value for Thailand was 0.763 in contrast with 0.995 for males, resulting in a Gender-related Development Index (GDI) value of 0.995. Thailand has a Gender Inequality Index (GII) value of 0.377 ranking it 84 out of 168 countries in the 2018 index. In Thailand, 5.3 percent of parliamentary seats are held by women, and 43.1 percent of adult women have reached at least a secondary level of education compared to 48.2 percent of their male counterparts. Female participation in the labour market is 59.5 percent compared to 76.2 for men (UNDP, 2019).

The Thai Government is giving more attention to gender equality and committed to overcome gender discrimination through legal arrangements. In 2015, it was adopted the Gender Equality Act where for the first time it was defined and prohibited gender discrimination. Moreover, in 2017 the Constitution declared the principle of equality between man and women. The Women's Development Strategy (2017-2021) is the national gender strategy that sets goals and targets. Thailand has regularly prepared five-year Women's Development Plans and is also signatory to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the ASEAN Declaration on the Gender-Responsive Implementation of the ASEAN Community Vision 2025 and Sustainable Development Goals. The National Committee for Sustainable Development (CSD), Thailand's mechanism for sustainable development, comprises of 37 members from the public and private sector, as well as academia and civil society. In 2015, Thailand appointed the permanent secretaries of the different ministries as Chief Gender Equality Officer to promote gender equality in their respective ministries, which will be consulted for advice during the implementation of this project. Thailand's Voluntary National Review of the implementation of the SDGs also stated that elements of SDG 5 on gender equality will be implemented in the next Women Development Strategy.

The gender assessment for specific project identified the following:

- (i) Formalization of roles and responsibilities within the legal framework and institutional arrangements can emphasize consideration for gender issues and gender disparity itself if gender related ministries and CSOs are not incorporated into the final arrangements.
- (ii) The project activity related to strengthening GHG inventory preparation has no direct links with gender aspects in terms of the data collection and analysis of the data to prepare GHG inventory.
- (iii) The project activities related to development of MRV framework for Agriculture sector is primarily focused on collection of data for estimating the GHG impacts. The methodologies on collecting GHG impact related are gender neutral. The assessment of socio-economic impacts of

climate action on community could benefit from gender disaggregated data to enable better targeted and inclusive climate mitigation action design. The project is not focused on socio-economic data collection for tracking climate mitigation actions.

(iv) The project activities related to tracking of meeting adaptation goals would benefit from gender disaggregated data on assessing climate vulnerability reduction from adaptation actions.

(v) It was also identified that project should ensure that capacity building in the project should provide equal access to all and be inclusive.

(vi) It was also identified that equal participation should be ensured in thematic working groups as the work will shape the outputs of the project. Such participation will allow for identifying entry points for integrating gender issues.

(vii) Training and capacity building could influence availability of technical expertise across both genders equally in the future if the project ensures to provide training to a group of stakeholders with an equal gender split, where possible. Not only access to training however, training must also be delivered in a gender sensitive manner.

These aspects were considered for developing the gender action plan. The challenge in addressing the points above lies in the existing availability of female technical experts within relevant stakeholder institutions. There is a need therefore to ensure that gender disaggregated data on participation and project access is made available for future human resource decisions within relevant line ministries.

Gender Action Plan:

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Considerations of gender equality and women's empowerment will be integrated in the implementation of the project activities, notably through a balanced gender representation in the training and capacity building provided to experts and staff in different agencies. Gender considerations will also be mainstreamed in the selection of the project management team as well as the consultants and experts for this project.. References are been made to the GEF Gender Equality Action Plan (GEAP) 2015-2018 as well as to the UN Environment Gender Equality and the Environment policy brief to further integrate gender in transparency work. Moreover, the project will benefit from the Global Coordination Platform activities on gender. Mainly, under its output 2.4 "Assistance provided to countries with integrating the UNFCCC Gender Action Plan into enhanced transparency frameworks" of the PIF approved GEF project "Global Capacity Building Initiative for Transparency (CBIT) Platform Phase II A: Unified Support Platform and Program for Article 13 of the Paris Agreement. The project activities are also aligned with the 12th National Economic and Social Development Plan which includes the activity of guiding development in the sub-region, region and other developing economies under the SDG agenda, including inequality reduction and social opportunities for women.

The National Statistical Program is well-established in Thailand, and the data available assesses typical gender gaps divided by different sectors on each province. However, even if the National Gender Data Plan is accessible, according to the Statistical Act in Thailand, gender is one of the 21 areas where data is needed, which is essential to assess gender needs and informing policy development. Indeed, some gender-relevant statistics are obsolete and there are some concerns regarding data quality issues, with different sources of information providing different statistics and limited analysis of the statistics available. Another challenge stakeholders mentioned is the limited data on how gender intersects with other equality characteristics.. These women can suffer from particularly acute inequalities, and a greater understanding of these can inform policy development that can help address these. (OECD. Thailand: Gender Budgeting Action Plan). However, sex-disaggregated data is not always sufficient to determine whether the project outputs have responded appropriately to the differentiated needs of women and men. Therefore, further qualitative information needs to be gathered on whether equality of opportunity has been provided. This includes conducting surveys that assess the effectiveness of training provided and analyses of gender barriers to appointed positions. This information should be gathered throughout the project and the lessons learnt fed back into the development process.

During the initial phase of the project implementation period, funds are set apart for a consultancy to implement the Gender Action Plan and provide further details of specific actions based on the outputs of each of the components, specifically working with the components 3&4 related to adaptation and climate finance tracking. The action gender expert will facilitate gender mainstreaming, perform stakeholder mapping, incorporate gender into vulnerability analysis, and guidance to the technical team how to ensure that data collected is disaggregated by sex.

To ensure gender equality and sensitivity throughout the project implementation phases, the undertaking of the following activities will be ensured :

- ? Identification and approach of gender gaps in participatory processes;
- ? Promote the national and local participation of women in decision-making according to their roles and responsibilities in public organizations related to the project.
- ? Include gender-disaggregated data gathering specially in context of the mitigation and adaptation action tracking to better inform gender responsive climate policies, plans, strategies and actions related to this project.
- ? Avoid gender stereotypes in all training material , employ inclusive language and use appropriate illustrations;
- ? Encourage women representation during capacity building workshops (both, among trainers and training participants) to promote gender parity;
- ? Address gender in the project team and stakeholder meetings, to help identify other areas where gender goals could be established.

[1] <https://www.weforum.org/reports/gender-gap-2020-report-100-years-pay-equality>

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women

Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

The sectors and sub-sectors covered under the project activities include resources owned by public sector (forestry) and/or individuals (agriculture farms). The focus of all outputs is on collecting information and data from public enterprise or government enterprises. Activities like emission factor development would engage research institutions. Within each sub-sector the mandate of engaging private sector, where relevant, is with the related government authority. These government institutions, as mentioned in stakeholder engagement plan, would engage the private sector as per the need in activities they will be responsible for.

The sectoral working group for GHG inventory preparation comprises public and private agencies which can request data through each sectoral working group. DEDE, the agency who is responsible for this activity, routinely requests data from private companies regarding use of fossil fuels such as natural gas, oil and coal, and is planning to set up technical working group which include private sectors during the project implementation period for review and consider related information such as heating value, carbon content and EF.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation. Additional information is available in the UNEP Safeguard Risk Identification Form (SRIF) document, attached to this submission.

Table 9. Identification of risks and mitigation strategies

Table 9. Identification of risks and mitigation strategies

Risk description	Main category	Risk level rating	Risk mitigation strategy and safeguards	By Whom / When?
<p>Insufficient participation of key institutions:</p> <p>Participation of lead agencies in the overall GHG inventory process, i.e. data collection and reporting, is key for the preparation of inventories and for tracking progress of the NDC implementation.</p>	<p>Institutional</p>	<p>Low</p>	<p>The formalization of the institutional arrangements, including procedures and processes definition of roles and responsibilities for data collection and reporting, and related trainings will raise awareness and ensure a greater buy-in of lead agencies in the national GHG inventory process and other key institutions. This is also built on existing informal coordination used for NCs and BURs.</p>	<p>ONEP/ throughout</p>

<p>Limited cooperation on data and information sharing among stakeholders:</p> <p>The provision of data from the various ministries, agencies and other stakeholders is a precondition for the elaboration of a national GHG inventory encompassing all relevant sectors.</p>	Communication	Low	<p>The project will build on recently established institutional arrangements to formalize timely data provision, and trainings that will raise awareness of the importance of each step of the information chain.</p>	All agencies involved in implementation/throughout
<p>Slow or in-existent coordination among institutions:</p> <p>Ministries tend to work independent from each other with limited or no coordination between them. Lack of coordination can lead to a duplication of work, ineffective use of resources and jeopardizes sharing of information and the harvesting of synergies.</p>	Institutional	Medium	<p>This project will build on existing institutional arrangements for transparency and climate change as a whole, established for the BUR and NC processes. Formalizing the institutional arrangements for data collection and defining clear roles will also enhance coordination and the communication flow between ministries and agencies. ONEP is also part of the National Committee on Climate Change Policy, comprising members from various ministries.</p>	All agencies involved in implementation/throughout

<p>Professional and staff turn-over:</p> <p>The provision of capacity building support is an integral part in this project. A high staff turnover, especially in key institutions, can lead to a loss of technical capacities and the overall institutional memory</p>	Capacity	Medium	<p>The development of sectorial guidelines, templates for data collection processes, as well as regularly provided trainings ensure the continuity of required technical capacities and skills.</p>	<p>ONEP, in collaboration with national technical institutions and academia/ throughout</p>
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<p>Lack of political willingness:</p> <p>High political support is crucial for the overall process and to ensure the buy-in of all relevant ministries and agencies.</p>	<p>Political</p>	<p>Low</p>	<p>The National Committee on Climate Change Policy (NCCC) is chaired by Thailand's Prime Minister and has members from 15 ministries and agencies such as the Ministry of Commerce and the Ministry of Transport and Communications. The Climate Change Master Plan, Thailand's framework document for coping with climate change, is approved by the cabinet.</p> <p>Thailand has further integrated climate change in a number of national policies, most notably the 12th National Economic and Social Development Plan, serving as the country's overall strategic development plan. Thailand has already submitted two National Communications, with the third one being published in August 2018, and two Biennial Update Reports, showing Thailand's overall commitment of complying with the international reporting requirements of the UNFCCC.</p>	<p>NCCC/beginning of project and thereafter through steering committee meetings</p>
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<p>Duplicity of activities among other related projects:</p> <p>Communication between relevant stakeholders and coordination of on-going projects is essential to harvest synergies and avoid overlaps.</p>	<p>Communi-cation</p>	<p>Medium</p>	<p>This project will build on existing institutional arrangements set-up for the preparation of the BURs and NCs, with ONEP as the lead coordinating agency for GHG inventories as well as the national focal point to the UNFCCC in order to sustain institutional arrangements. Key stakeholders involved in pre-existing transparency work will be engaged from the beginning of this project with a view to retain institutional memory.</p>	<p>ONEP/ throughout</p>
<p>Not completing the project on time: finishing the project in its 3-year timeframe demands a continuous monitoring of the adequate implementation of activities and outputs</p>	<p>Organi-zational</p>	<p>Low</p>	<p>The Institutional Arrangements defined for the implementation of the project facilitate a close tracking of the project on a regular basis. The relative independence of the different activities defined for the project may allow to implement several of the activities in parallel during the project, and, in case some delays at the beginning or in between the project are produced.</p>	<p>ONEP/as per monitoring and evaluation plan</p>

<p>Restrictions in stakeholder participation and other activities due to periodical COVID-19 outbreaks: restrictions set in place in order to reduce the transmission of SARS-nCOV-2 may affect the mobility and participation of stakeholders and implementers</p>	<p>Systemic</p>	<p>Medium</p>	<p>It is plausible that, if the COVID-19 pandemic continues unabated, it may affect the project implementation. However, Thailand has been relatively successful in controlling outbreaks, IT-based modes of work are widespread in institutions and companies, and most stakeholders are used to remote participation. Internally within Thailand no cases have been reported since June 2020. The measures taken by the government are strong to control any internal outbreak and has the capacity to quickly react. This is likely to ensure that internal travel within Thailand will not be affected and, hence, data gathering activities will not be significantly delayed. The project is expected to start by April 2021 and likelihood of vaccination being available in H2 of 2021 will improve the situation further.</p> <p>The risk of COVID related assessment will be continuously kept under review by the PMU and measures designed to address any emerging situation.</p>	<p>All agencies involved in implementation/throughout</p>
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<p>Climate-related risks: climate-related exposures, impacts and parallel activities affecting the project implementation</p>	<p>Systemic</p>	<p>Low ? medium (see extensive assessment below)</p>	<p>Climate-related impacts and exposures, such as extreme weather events, as well as others, could affect the implementing ability of involved agencies and stakeholders, and competing parallel activities subtract resources and attention to CBIT. Especially the activities related to the emissions factor development in the agriculture sector, namely fieldwork activities to estimate soil carbon emissions, could be affected by climate impacts such as flooding or fires, depending on where these field measurements will be conducted. In case of those events, appropriate other areas for field measurements will be identified. Overall ONEP and the other agencies have a long experience of implementing activities throughout exceptional periods. Outcome 4 of this project will enhance the information base on climate risks, impacts and vulnerability in the country and will thus enable more targeted adaptation actions and integration of adaptation matters into policymaking in the future.</p>	<p>All agencies involved in implementation/throughout</p>
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<p>Delayed implementation and /or insufficient coordination with other initiatives to strengthen MRV and ETF Impacts the overall achievement of the CBIT project</p>	<p>Institutional</p>	<p>Low ?</p>	<p>The risk is low as ONEP's has a record of timely implementing donor projects. ONEP is responsible for coordinating all MRV/ETF related donor projects and internal projects. Existing ONEP mechanism of coordination will be used to regularly track progress of other initiatives and ensure synergies. TOR requires the PM to regularly review and coordinate with other MRV/ETF initiatives.</p>	<p>National Project Director, supported by the PM</p>
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Climate Risk Assessment

Thailand's climate change risks

Thailand is an upper-middle income country and the second largest economy in Southeast Asia with an expected annual Gross Domestic Product (GDP) growth rate of 3%. The economic growth has caused a continuous increase of GHG emissions as well as environmental costs, including large losses of primary forest areas in the country. At the same time, climate change poses an increasing challenge for Thailand which, due to its geography and socio-economic characteristics, is highly vulnerable towards the adverse impacts of climate change

With a total coastline of over 3,150 kilometers, where more than 12 million people live, Thailand is highly vulnerable towards coastal flooding, and ranks among the ten most affected countries by climate change. The country is experiencing an increase in temperatures and changes in rainfall patterns, leading to severe droughts, as well as floods and subsequent landslides. The country has been affected by a number of extreme floods in recent years, most notably the flood in 2011. The risks for flooding are exacerbated by land conversion activities in particular the Northeast of the country in the province of Nan, where forested hills are converted to maize fields, driven by a growing demand for fodder for poultry production in the region. While the forests slowed down the water flow, in case of heavy rainfall, the water now flushes

down the bare hills into the Nan river, which is one of the most important tributaries to the Chao Phraya river which flows through the capital of Thailand.

As one of the largest rice producers in the world and with one third of the country's labor force employed in the agricultural sector, those climatic changes lead to great economic losses and jeopardize the country's food security. Drought severely affects subsistence farmer as they largely depend on rain-fed agriculture, and approximately 80% of the farmland in the North and Northeast of Thailand is without irrigation. The impacts on infrastructure through floods is also substantial, and the flood in 2011 alone led to economic damages and losses of approximately US\$ 46.5 billion, mostly within the Bangkok metropolitan area. Adaptation to climate change is therefore seen as a top priority in the country.

Overall, the country of Thailand is divided into four major natural geographic regions with a mountainous north, an arid northeast with the Korat plateau, the fertile central plains, including the Chao Phraya River basin and the southern peninsula. The country has a coastline of over 2500km along the Gulf of Thailand in the east and the Andaman Sea in the west. Thailand's climate is classified as tropical savanna in the mainland and tropical monsoon in the Southern Peninsula, with influences of monsoons and tropical hurricanes. Overall, there are three distinct seasons in Thailand (hot, wet and mild) with the highest temperatures usually occurring in April. The mean annual temperature ranges from 22-32°C and the average range of annual rainfall is 1,300-2,000 mm, where especially the Southern Peninsular receives more rainfall on average than the mainland. Thailand is already experiencing the effects of climate change and has experienced a large number of floods, storms and extended drought periods, with particular challenges agricultural sector. Thailand ranks number eight of the countries most affected by extreme weather events in the period 1999 to 2018 (long-term climate risk index) in the Global Climate Risk Index[1], followed by Nepal and Dominica. The Global Climate Risk Index analyses the quantified impacts of extreme weather events both in terms of fatalities as well as economic losses and is based on data by the Munich Re NatCatService. For Thailand, a total number of 147 extreme weather events have been recorded for the period of 1999 to 2018 with a total death toll of 140,000 and a total economic loss of 7 764.06 in million USD in purchasing power parity.

As per the World Bank's Climate Change Knowledge Portal[2], based on the Coupled Model Intercomparison Project, Phase 5 (CMIP5) models included in the IPCC's Fifth Assessment Report (AR5), key projected climate trends for Thailand are the following

- A mean annual temperature increase of 1.4 to 1.8°C by the 2060's, and 3.0 to 3.8°C by the 2090's.
- The projected rate of warming is similar in all three seasons, but more rapid warming is projected for the northern and central regions of the country than in the southern, coastal regions.
- The annual precipitation is projected to rise by 81.77mm (-270.38mm to 532.10mm) in the period 2040-2059 (RCP 8.5)
- Overall, different models show a range of changes in precipitation for Thailand with projections varying between +28% to +74% by the 2090's.
- The percentage of 'wet days' is projected to largely increase in all seasons with the maximum increase for November and the February to May season

In addition to that, further climate projection as presented in Thailand's Third National Communications are the following:

Regarding extreme weather, an increase in the number of days with a maximum temperature of more than 40°C is projected for the lower part of Northern Thailand and the upper part of Central Thailand. Consecutive dry days in Northern, Central, Western and North-eastern Thailand are projected to amount to roughly 100 days.

- The number of days with a daily rainfall of more than 35 mm is projected to be 15-20 days for Eastern and Southwestern Thailand, while the number of days with more than 90mm is projected to be 3-5 days for Eastern and Southern Thailand.

According to the Center for Hazards and Risk Research at Columbia University[3], Thailand is significantly affected by hydrological and drought events, particularly in the central, eastern, and southern regions. The entire country is severely impacted by floods with regard to mortality and impacts on GDP, whereas droughts only rank in the moderate to lower deciles Overall, the risk profile of Thailand to natural disasters include the following[4]:

- Moderate risk to tropical cyclones
- High risk to floods
- Moderate risk to drought, land slide, fire, earthquake and agricultural pests & diseases

Regarding floods, Bangkok and its vicinities as well as the Chao Phraya river basin as well as the areas along the Chi and Mun river are identified as vulnerability hotspots. The mountainous North of the country is hereby particularly vulnerable towards flash flooding and landslides, while the northeastern Korat Plateau is also prone to flash flooding as well as freshwater inundation during the rainy season. The central Chao Phraya River Basin is also prone freshwater inundation during the rainy season. The southern peninsula is vulnerable towards mudslides and forest fires as well as tropical storms and rainfall- and ocean-induced flooding in low-lying and coastal areas. The central part of the northern region and the northeastern region which is not connected to the Mekong river are vulnerability hotspots for drought. The country's Agriculture sector has been recognized in the country's strategic climate change plans (e.g. NAP and NDC) as particularly vulnerable to climate risks in the form of extreme rains event and floods in some parts of Thailand and extended periods of drought in other areas. In addition to that, temperatures above 34°C negatively affect rice yields.

To cope with disaster and climate risks, the Government of Thailand has formulated the Disaster Prevention and Mitigation Act 2007, the Disaster Mitigation Plan by the Ministry of Defense and the National Disaster Risk Management Plan (2015), which has been updated to include the principles and tasks of the Sendai Framework for Disaster Risk Reduction and to consolidate strategies for implementation, including a focus on disaster risk reduction, the application of an integrated emergency management system, strengthening and enhancing efficiency of sustainable disaster recovery or build back better and safer, and promoting international cooperation on disaster risk reduction. It aims to serve as a

tool for reducing the impact of disasters, realizing disaster risk management standards in every community as well as for further integrating disaster risk reduction thinking and methods into the national sustainable development process. This plan outlines implementation strategies in accordance with the country's Disaster Prevention and Mitigation Act (2007). All relevant agencies are required to use this plan as a blueprint, framework and guideline for national disaster management actions.

Thailand's Climate Change Master Plan also includes several medium- and long-term goals related to disaster management. The medium-term goal for 2020 includes the development of effective and comprehensive early warning measures such as pest and meteorological forecasting for the agricultural sector and natural disaster management. As long-term (2050) and ongoing goals, the soil and water restoration in areas with repeated natural disasters shall be enhanced, and the proportion of farmers in areas at risk who have received training in natural disaster prevention shall be increased. Additionally, vigilance and early warning systems for natural disasters in areas that are at risk shall be strengthened and overall, the number of fatalities and losses due to natural disasters shall be limited. The adaptation strategy included in the Climate Change Master Plan further lists specific activities for natural disasters management specific to the agriculture sector, including the development of agricultural risk maps that will aid in forecasting the occurrence of disasters such as outbreaks of plant and animal diseases, flooding, drought, landslide, saltwater intrusion as well as the development of accurate and long-range forecasting and prediction techniques for climate variation and extreme weather events in Thailand. Overall, the Climate Change Master Plan aims to enhance adaptive capacity in all sectors but emphasizes sectors with high sensitivity to change that possess low capacity for handling the impacts. This includes low-income citizens, communities in areas with natural disaster risks as well as agricultural and business groups relying primarily on weather and natural resources.

Regionally, the ASEAN Agreement on Disaster Management and Emergency Response has been formed with the objective to provide effective mechanisms to achieve substantial reduction of disaster losses in lives and in social, economic and environmental assets of ASEAN member parties and to jointly respond to disaster emergencies.

Thailand's response to climate change

Recognizing these serious threats posed by climate change, and to safeguard the livelihoods of the population dependent on agriculture and in support of the global efforts to address climate change, Thailand ratified the UNFCCC and the Kyoto Protocol (KP) in 1994 and 2002 respectively, and the Paris Agreement in September 2016. Thailand is committed to mitigate its emissions and is increasing its efforts towards a low-carbon economy. At the Conference of the Parties (COP) 20 in Lima in 2014, Thailand pledged to lower its CO₂ emissions from 7-20% by 2020, compared to Business as Usual (BAU), through Nationally Appropriate Mitigation Actions (NAMAs) within the sectors Energy and Transport. Important policies and plans to promote low-carbon and climate resilient development and green growth in Thailand include the 12th National Economic and Social Development Plan (2017-2021) and the 20-Year Strategy (2017-2036) by the National Economic and Social Development Board (NESDB) and the National Policy on Green Growth (2013-2030).

The country's highest-level policy document is the 'Thailand Climate Change Master Plan' (2015-2050), developed by the Office of Natural Resources and Environmental Policy and Planning (ONEP) and its

Climate Change Management and Coordination Division, in close collaboration with the public. The Climate Change Master Plan (CCMP) serves as a framework document and mechanism for the country's response to climate change for the transition towards a low-carbon and climate-resilient society, in line with a sustainable development pathway and based on the philosophy of sufficiency economy. To achieve this vision, the CCMP specifies three key strategies: 1) Adaptation for coping with the negative effects of climate change, 2) Mitigation of greenhouse gas emissions and increase of greenhouse gas sinks and 3) Strengthening the capacity of human resources and institutions and to manage the risks from the effects of climate change and cross cutting issues and 18 sectoral priorities, six of which are focused on adaptation. The document sets out a number of short- (2016), medium- (2020) and long-term (2020-2050) targets for the three strategies. The CCMP acts as five-year rolling plan and is under revision for 2020. Sectoral efforts to address climate change have also been underway. In the Agriculture sector for example, the Agriculture Strategic Plan for Climate Change (ASPCC) (2017-2021) was developed in alignment with the Climate Change Master Plan to guide adaptation in Thailand's agriculture sectors.

Thailand communicated its Intended Nationally Determined Contribution (INDC) on 1 October 2015 and its first NDC on 21 September 2016 to the UNFCCC. The NDC (2021-2030) includes a mitigation and adaptation component and lays out an economy-wide (excluding Land Use, Land-Use Change and Forestry, or LULUCF) GHG emissions reduction of 20 percent compared to the business-as-usual (BAU) level, estimated at 555 MtCO₂ in 2030. Through additional means of implementation via capacity building, financial resources and technology development and transfer, the emission reduction goal is expected to be increased to 25%. Thailand's adaptation component includes a large number of prioritized adaptation efforts such as the promotion of sustainable agriculture and the increase of national forest cover to 40% through local community participation. To raise Thailand's adaptive capacity, the need for adequate financial resources and technology development and transfer is pointed out, especially for the agriculture sector and for water resource management.

For the implementation of its NDC and to achieve Thailand's emission reduction goal, an NDC Roadmap has been developed through a national consultative process. The cabinet approved the NDC Roadmap on Mitigation for the period from 2021 to 2030 on May 23, 2017. The NDC Roadmap lays out mitigation actions in the sectors Energy & Transport, Waste and Industrial Processes and Product Use (IPPU) and is based on a number of national plans such as the Energy Efficiency Plan and the Alternative Energy Development Plan. The NDC Roadmap is envisioned to bring about a GHG emission reduction of 115.6 MtCO₂e.

Responding to requirements laid out in the Paris Agreement, Thailand is currently in the process of revising its NDC with the support of the NDC Support Programme by the United Nations Development Programme (UNDP). Thailand further responds to the call to Parties of the Paris Agreement to submit a long-term low greenhouse gas development strategy in 2020. ONEP is currently in the process of developing the country's first Long Term Strategy for Climate Change, which will be aligned with the Climate Change Master Plan and will be built upon the NDC Roadmap 2030 to achieve low GHG emissions and climate-resilient growth. ONEP is in the process of drafting the Climate Change Act, which will be subject to a public hearing process, and is expected to be submitted to the Cabinet in March 2021. Thailand is further planning to submit a new NDC by 2025 and to this end it will explore the inclusion of mitigation actions within the Agriculture sector in the new NDC.

In order to effectively plan, implement and monitor these climate actions, and to overcome existing gaps and barriers, it is necessary to enhance Thailand's institutional, human and technical capacities in the medium- and long term. Some of the main gaps include methodologies for GHG data collection, compilation and reporting especially from AFOLU, the need for enhanced technical capacities of key staff involved in the inventory process and the need for a transition towards the 2006 IPCC Guidelines. Addressing these gaps will significantly enhance the GHG inventory quality and will enable the country to report GHG inventory according to the 2006 IPCC Guidelines. In addition, Thailand will be able to track progress of NDC implementation by accounting on emission and removal corresponding to its GHG inventory.

[1] Germanwatch 2019. Global Climate Risk Index 2020. Available at:
https://www.germanwatch.org/sites/germanwatch.org/files/20-2-01e%20Global%20Climate%20Risk%20Index%202020_14.pdf

[2] <https://climateknowledgeportal.worldbank.org/country/thailand/climate-data-projections>

[3] <https://www.ldeo.columbia.edu/chrr/research/profiles/thailand.html>

[4] https://info.undp.org/docs/pdc/Documents/THA/3771_THA_Annexes.pdf

This CBIT project will strengthen Thailand's institutional and technical capacities to comply with the Enhanced Transparency Framework of the Paris Agreement, with a particular focus on the AFOLU sector, which is strongly affected by the impacts of climate change, notably flooding and droughts. Overall, the project targets institutions and capacities at the central government level based in Bangkok, with the subnational level included in component 4. The main climate risk in Bangkok is flooding and the city is also often affected by haze mainly from the burning of agricultural residues as well as forest fires, which are in many cases anthropogenic.

This project will enhance the institutional arrangements for tracking GHG emissions in the AFOLU sector as well as for tracking the mitigation measure of open burning reduction. Strengthened institutional arrangements in the sector will also enhance overall collaboration among the different ministries and agencies involved in the AFOLU sector which facilitates a timely response in case of extreme events. Increased transparency on the open burning mitigation measures will facilitate an overall reduction of open burning in the Agriculture sector with a view to increase the resilience of crop cultivation and avoid the spread of fires, especially in the dry season.

Most importantly, the CBIT project will strengthen technical and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development in the Agriculture Sector by, among other, the development of metrics, indicators and methodologies for tracking adaptation goals. Enhanced capacities on integrating information and knowledge on impacts, risks and vulnerability from climate change into policy formulation in the Agriculture sector will enhance the resilience and overall adaptive capacity of the sector towards climate change impacts which is aligned with goals put forward in the Thailand's Agriculture Strategic Plan on

Climate Change. Increased capacities on monitoring and evaluation of adaptation actions will equally increase adaptive capacity of this sector.

In summary, the project is a low-risk project in relation to climate change risks but will in fact contribute to reducing climate risks by enabling evidence-based policy making.

6. Institutional Arrangement and Coordination

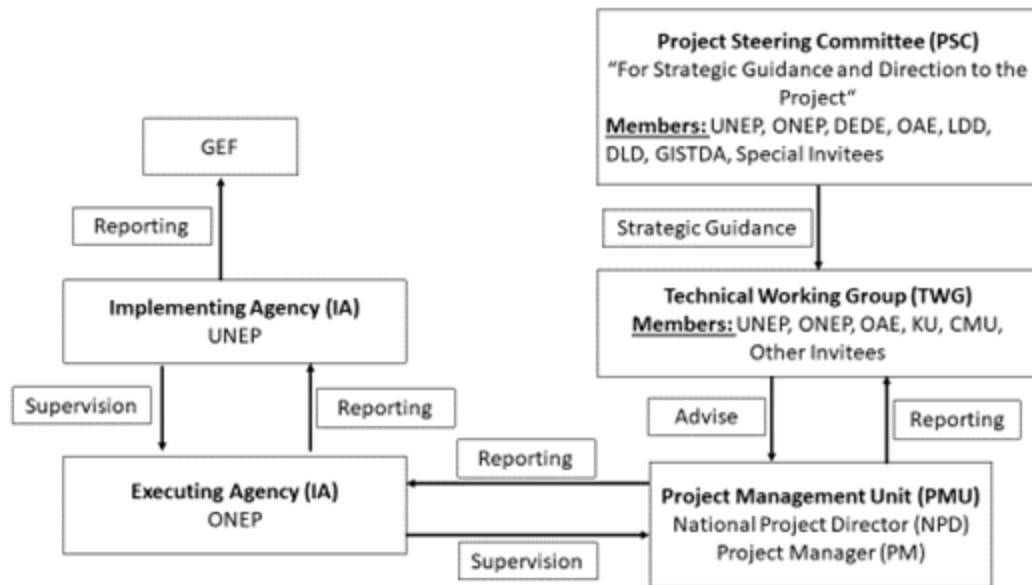
Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

? Institutional arrangements:

The project is funded by the Global Environment Facility (EF) with the United Nations Environment Programme (UN Environment) acting as the GEF Implementing Agency. The Office of Natural Resources and Environmental Policy and Planning (ONEP), under the Ministry of Natural Resources and Environment (MoNRE), is the Executing Agency. ONEP will carry out a process to identify an appropriate entity to provide administrative support, notably for managing the GEF funds and to conduct procurement in the project, on behalf of ONEP. An agreement will be entered between UNEP and the selected entity for the transfer of the GEF funds from UNEP to the entity.

The structure is illustrated in Figure 3 below and roles and responsibilities of each bodies are detailed in the following graph:

Figure 3 CBIT Thailand institutional arrangements and coordination



The project will establish a Steering Committee that will meet twice a year, ensuring a coordination across different initiatives occurring in parallel and a Project Management Unit which will be composed by a National Project Director (NPD) and a Project Manager (PM).. A third party support entity will be selected by ONEP to provide administrative support to the project in the form of fund management and procurement.

The project will further establish a relevant Technical Working Group with relevant entities to provide technical advice to the Project Management Unit.

The initiative will follow the detailed institutional structure described in Annex H. Project Implementation Arrangements.

Coordination with other initiatives:

This project will build on the activities and outcomes of other transparency-related initiatives which have been undertaken in Thailand (please see baseline scenario), notably the support provided for the preparation of Thailand's two Biennial Update Reports (BUR) and three National Communications (NC)

and the ongoing support for Thailand's fourth NC and third BUR with support from the GEF through the United Nations Development Programme. ONEP is the executing entity of the NC4-BUR3 project which will have an overlapping timeframe with the implementation of the CBIT project. The CBIT work CBIT will be thus closely coordinated, especially by having a common focal point for the two projects in ONEP, to ensure that the outputs of the two projects are implemented synergistically and to avoid duplication of efforts. Also, where possible the outputs of CBIT will be tested by application to tasks undertaken in the NC4-BUR3 project in preparing GHG inventory and reporting on mitigation action progress and impacts.

The Office of Natural Resources and Environmental Policy (ONEP), as the national climate change focal point, has been coordinating the preparation of GHG inventories for the BURs and NCs. Building on the institutional structures, put in place for the preparation of the BURs and NCs, ONEP will act as this project's Executing Agency, coordinating the different activities and stakeholder involvement, and will thus be able to identify overlaps and synergies with other activities and initiatives. ONEP is also the lead agency of the Thailand Greenhouse Gas Emissions Inventory System (TGEIS) and a newly initiated database system for tracking support received, both of which provide the basis for activities in this project through. The project can further draw on lessons learned from both mitigation and adaptation projects, notably the Thai German Climate Programme (Agriculture component), the Thai Rice NAMA and the NAP-Ag project by the FAO and UNDP.

Since ONEP is the main counterpart of most of these initiatives, plays a significant part in all as the national focal point on climate change agenda, and will ensure the smooth and complete integration of all efforts into the whole transparency systems. For example, currently, GIZ under the Thai-German Climate Programme (TGCP) is helping the Climate Policy Project to support capacity development to prepare the first biennial transparency report due in 2024. The Quality Control (QC) of Activity Data (AD) is crucial for improving the quality and transparency of National GHG Inventory for NC and BUR, as well as the BTR in the future. To improve QC of AD in each sector the project aims to develop QC template so as to perform the QC of AD and to add on this part to MRV Handbook of GHG inventory of each sector. At this stage, the QC template of energy and waste sectors are prepared to test-run by related agencies. Thus the activities funded by CBIT project will be built upon the initial QC procedure development under the GIZ project.

With support from World Bank's Forest Carbon Partnership Facility, Thailand is currently developing a national REDD+ strategy, including a component on forest monitoring and emissions, and the development of an IPCC compliant MRV system for REDD+. The development of a Reference Emissions Level is stated to require intensive coordination between different agencies in the forestry sector such as the Royal Forest Department and the Department of National Parks and other stakeholders. The CBIT project (Output 1.1) will enhance such coordination through strengthening institutional arrangements in the whole of the AFOLU sector. In addition to that, the FAO supported Thailand in developing a Forest Reference Level (FRL), against which emission reductions can be measured under the REDD+ mechanism, and further assisted the country in advancing its national forest monitoring system. CBIT activities, specifically under Output 1.1 and 1.4, must thus consider those REDD+ efforts.

Several countries in the region are also involved in CBIT activities through UN Environment, including Lao, the Maldives and Myanmar, and are at the implementation stage or design stage. Cambodia and Mongolia, supported through FAO, are in the implementation phase of their projects. Further, UNEP is working in a number of countries on CBIT projects and is partnering UNDP on Global Support programme for MRV. These experiences and knowledge from these projects will be leveraged where relevant. Efforts for coordination with these countries to foster knowledge-sharing and synergies, will be undertaken within this CBIT project, among other through regional peer-learning events

All in all, since all the donor projects relevant to the CBIT projects are in partnership with ONEP, the coordination of Donors is in-built as ONEP is and will be the lead agency in executing all projects related to the MRV and strengthening of ETF.

This project will also coordinate with the CBIT Global Support Programme (GSP) through utilization of the knowledge products developed under the GSP and will engage with peer-to-peer exchange through GSP. Furthermore, the CBIT project will coordinate with UN country team in Thailand particularly the UN Resident Coordinator's Office and team. The CBIT project is aligned with the United Nations Partnership Framework (UNPAF) for Thailand, especially with regard to its Outcome Strategy 1 (Collaborate at national and sub-national levels to strengthen systems, structures and processes for effective, inclusive, and sustainable policymaking and implementation), particularly to fulfil the extent to which implementation of comprehensive measures, plans, strategies, policies, programmes to achieve low greenhouse gas emission and climate resilient development objectives has improved that is aligned with the CBIT project objective: Thailand has the necessary capacities and institutional arrangements to comply with the requirements of the Enhanced Transparency Framework.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

This project is strongly aligned with Thailand's national priorities and builds upon national policies and plans. Thailand's *12th National Economic and Social Development Plan (2017-2021)* has among others the objective to "*improve the capacity for greenhouse gas reduction and adaptation*" and states that a GHG inventory is critical for developing a reliable MRV systems. One of the activities mentioned in the plan is to prescribe measures and mechanisms to support greenhouse gas reduction in all sectors as well as to encourage the private sector, state enterprises and local administration to collect and report GHG emissions data and other relevant information for updating the national GHG inventory and forecasting GHG

emissions development. Those activities will directly benefit from an enhanced national transparency system, established through this CBIT project, especially from strengthened technical capacities monitoring of mitigation actions and enhanced institutional arrangements for data collection. Thailand's *20-year National Strategy (2017-2036)*, translated into action by the five-year country development plans (i.e. the 12th Economic and Social Development Plan) also establishes the goal of GHG emissions reduction as well as an increase in forest cover, following the overall sufficiency economy philosophy. Establishing permanent institutional arrangements for transparency and enhancing technical capacity of local experts and staff will contribute to this long-term strategy.

This project will also support the implementation of Thailand's framework document on climate change and long-term plan, *the Climate Change Master Plan (CCMP)*. The Plan's vision of a climate-resilient and low-carbon society shall be achieved, through adaptation and mitigation components and cross-cutting activities such as capacity building and awareness-raising as well as developing appropriate knowledge base, databases and technologies. One of the short-term goals of the Master Plan is the development of a GHG emission database, a GHG mitigation registry and a database to support climate change negotiations. The CBIT project can specifically support this plan by enhancing the quality and extent of national GHG data, and by strengthening technical capacity over time. In addition, the project is strongly in line with and will address the national barriers, gaps and needs identified in Thailand's *BUR* and *NC* processes, including the *ICA* process. These include, insufficient capacity for GHG estimation activities, the lack of country-specific emission factors, with Agriculture and Forestry among the highlighted sectors, as well as the need for stronger cooperation among related agencies. This CBIT project is targeted towards enhancing Thailand's transparency system in the long-term and will therefore support Thailand in complying with requirements under the Enhanced Transparency Framework. More specifically, the sectoral guidelines, templates and tools to be developed, among others, in all four components of this project will facilitate the biennial reporting from the different agencies.

Although the project focuses on the AFOLU sector, which is not included in the mitigation component of Thailand's of Thailand's NDC, it lays the groundwork for future inclusion of mitigation actions in this sector, as planned for by Thailand, particularly through Component 2 of this project. The development of a country-specific emission factor for selected fuels in the Energy sector also contributed to enhanced transparency of emissions in the Energy sector. Adaptation is also a top priority of Thailand's NDC requiring substantive capacity building of relevant stakeholders. This CBIT project, notably component 4, will support achieving this priority. Enhanced transparency of international support received will also support implementation of mitigation and adaptation actions in general and will facilitate strategic decisions on future international funding. The CBIT project is aligned with Thailand's United Nations Partnership Framework for the period 2017-2021. One of the envisioned results in this framework is to largely improve the 'implementation of comprehensive measures, plans, strategies, policies, programmes to achieve low greenhouse gas emission and climate resilient development objectives' (indicator no. 6). Strengthened transparency and MRV capacity through the CBIT components support Thailand's efforts towards this result. Moreover, the CBIT project, notably component 1, complements efforts towards a

second result stated in this framework: to achieve a positive trend in sustainably managed forest cover (indicator no. 4).

The project contributes to Thailand's efforts towards the *Sustainable Development Goals*, addressing three specific indicators under three SDGs. SDG 13 on Climate Action comprises the target 13.3 'Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning' and its indicator 13.3.2 'Number of countries that have communicated the strengthening of institutional, systemic and individual capacity building to implement adaptation, mitigation and technology transfer, and development actions'. All components of the CBIT project, putting a strong emphasis on institutional and individual capacity building, support Thailand's efforts towards indicator 13.3.2. The CBIT project further contributes to SDG 2 with the target 2.4 'Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality' and its indicator 2.4.1 'Proportion of agricultural area under productive and sustainable agriculture'. The specific focus of the CBIT project on an enhanced transparency system in the agricultural sector in components 1, 2 and 4 facilitates the shift towards more sustainable agriculture, including improved soil quality, and contributes to enhanced resilience and adaptation capacity. The project also addresses SDG 15 with the target 15.2 'Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally' and its indicator 15.2.1 'Progress towards sustainable forest management'. Specifically, component 1 aims to establish improved institutional mechanisms and GHG inventory capacities in the forestry and land use sector. Lastly, Component 4 is fully aligned with Thailand's National Adaptation Plan, addressing monitoring and evaluation, and mainstreaming into policy of adaptation in Agriculture, which is one of the six priority sectors identified in the NAP, as directed by Thailand's Climate Change Master Plan (2015-2050). The NAP aims to help Thailand become resilient and adapt to the impacts of climate change.

Thailand's United Nations Partnership Framework (UNPAF) (2017-2021) is aligned with the 12th National Economic and Social Development Goals and is guided by the analysis of the Common Country Assessment (CCA). One of the opportunities for Thailand stated in the UNPAF is 'Data revolution' and it is pointed out as a challenge that 'data from different sources is not consistently collated and analysed, and its use in policy deliberations and decision-making is limited' as well as that 'statistical consistency and knowledge acquiring in new areas such as SDG Indicators, environmental statistics, etc., still remains challenging'. One of the four Outcome Strategies of the UNPAF is to 'Collaborate at national and sub-national levels to strengthen systems, structures and processes for effective, inclusive and sustainable policymaking and implementation'. As such, the CBIT project is aligned with this Outcome Strategy as it will strengthen institutional arrangements and data collection processes, building on existing systems (e.g. TGEIS) and enhance the evidence basis for policymaking. Further it is stated to this Outcome Strategy that 'The UN system in Thailand will support the RTG (Royal Thai Government) and other development stakeholders in enhancing mechanisms and processes for making and implementing policies within the

sectors and areas that are pertinent to national development?. The AFOLU sector, and the Agriculture sector in particular is a key sector in the Thai economy with millions of livelihoods depending on it and as a major exporting sector. The CBIT project with its focus on the AFOLU/Agriculture sector is thus contributing to achieving this Outcome Strategy.

The fourth Outcome Strategy is to "Collaborate at national and sub-national levels to build systems, structures and processes that expand the methodical exchange of expertise and technology available regionally/globally to support social, political and economic development?". Here it is further mentioned that this strategy "reflects Thailand's strategic position in ASEAN and the wider Asia-Pacific region, and the country's commitment to contribute to sustainable development of its neighbors, including through experience exchange and mutual learning?". The exchange of knowledge and expertise through for instance the CBIT Global Coordination Platform and other fora such as the PATPA Asia Pacific Group will contribute to this Outcome Strategy.

Furthermore, one of the indicators included in the Results Matrix of the UNPAF is the "Extent to which implementation of comprehensive measures, plans, strategies, policies, programmes to achieve low greenhouse gas emission and climate-resilient development objectives has improved?". As means of verification ONEP is stated to assess and compile relevant information annually. The CBIT project is aligned with this indicator as it will improve the information flow and better enable such assessments by ONEP in the future.

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

Under this project, Thailand will further engage in the CBIT Global Coordination Platform^[1] (for sharing of lessons-learned and other relevant data and information. Thailand already has a project page on the platform, which will be regularly updated by the project manager with information about the implementation of the CBIT project activities, announcing events related to the project implementation, such as stakeholder inception workshop, technical meetings, and trainings (agenda, presentations, and photos can be uploaded), uploading of project documents related to the implementation of the project, for example deliverables, reports, and any knowledge resources that are generated through the project activities, information about other transparency initiatives and projects in the country, and information about capacity needs and country's priorities for capacity-building. Participation in global CBIT meetings, conducted annually, with CBIT countries and donors and other relevant transparency stakeholders is also planned (under Output 1.2) for learning and sharing lesson-learned on data collection and transparency in general in the AFOLU sector. In particular, exchange with FAO's Global-CBIT AFOLU project as well as its various national projects such as those in Mongolia and Cambodia, both focusing on the AFOLU sector, is important. However, given the COVID-19 pandemic, the future format of those global CBIT meetings is uncertain. The last global CBIT meeting, which was supposed to take place in Spring 2020, has been postponed to unknown date. Also, other appropriate transparency-related events will be considered for

participation such as the Transparency Days at COPs, which have been organized by the Paris Committee on Capacity-building.

The project will take advantage of every opportunity to learn from lessons learned of previous projects and experiences including those in other countries. The key annual UNFCCC's workshop "Regional Training Workshop on the Building of Sustainable National Greenhouse Gas Inventory Management Systems, and the Use of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for the Asia-Pacific and the Eastern Europe Regions" would serve as one of the best platform where the Thai government could gather valuable lessons learnt from other countries. In addition, other donor meetings arranged in country may provide additional lessons learnt from other similar and/or related projects.

In addition, ONEP, as the national focal point coordinating climate change action in Thailand, will be leading the management of information and knowledge products resulting from the different project activities and will also provide regular update on those activities to the different agencies and ministries. ONEP will also share project-related information through the National Climate Change Committee (NCCC), which will ensure a wide outreach to the representatives of different ministries and experts. Under Thailand's CBIT project, there is a budget of approximately US\$ 154,000 allocated to knowledge management and dissemination-specific activities, namely publication, translation and consultations, all of which are specified in the overall budget. The key deliverables for knowledge dissemination as a result of this project are listed below:

- ? Guidelines (including templates and necessary tools) for aerial photography and satellite image interpretation, and identification of forestry and non-forestry areas (Output 1.1.2)
- ? Proposed guidance on the application of QA/QC procedures in the GHG inventory compilation for the Forestry sector (Output 1.1.4)
- ? Guidelines of processes and procedures for collection, reporting, and quality control of GHG estimations from open burning reduction measures (Output 2.1.1)
- ? Guidelines for the sector-specific indicators, information matrix, and evaluation system for open burning reduction measures (Output 2.1.2)
- ? Guidelines on estimating GHG emissions reduction impacts in open burning reduction measures (Output 2.1.3)
- ? Guidelines and methodological framework for reporting, monitoring and evaluation for climate change impacts and adaptation in the Agriculture sector (Output 4.1.2)
- ? Training curriculum for adaptation in Agriculture sector (Output 4.1.3)

Under this project a number of guidelines and guidance documents (i.e. Outputs 1.1.2, 1.1.4, 2.1.1, 2.1.2, 2.1.3, 4.1.2 and 4.1.3) as well as tools for data collection will be developed and will serve the knowledge management of this project. The guidelines and guidance documents will further help to address the issue

of knowledge loss related to high staff turnover, as explained in the 'sustainability' subsection. The involvement of the Kasetsart University (Component 1) and the Chiang Mai University (Component 4) will further involve knowledge dissemination in the form of scientific products, conference presentations and training of graduate students. Involved sectors and their lead agencies will further be engaged in knowledge management of the project, by collecting and providing relevant information to its staff and other agencies and ministries. The timeline for knowledge management work heavily depend on the precedent activities leading to the documentation of these guidelines and guidance. While those under Components 1 and 2 are aimed to be in the development process from quarter 4 of the project implementation year 1 onwards, the guidelines for the adaptation component (Component 4) is to be developed much later than that, expectedly, starting from the beginning of year 3.

As an active member of the ASEAN community and as a major economy in the region, Thailand can assume a leading role in transparency work, aligned with the Paris Agreement, and become a reference point for neighboring countries in Southeast Asia, contributing to building their capacity in peer-to-peer learning settings such as the Climate Change International Technical and Training Center (CITC). The 12th National Economic and Social Development Plan also acknowledges Thailand's increasingly crucial role on the international and regional stage, and in neighboring countries. The country therefore attaches high importance to the role of South-South Cooperation to achieve climate change as well as sustainable development goals and supports the Southern Climate Partnership Incubator initiative to accelerate climate partnerships among developing countries.

[1] The CBIT Global Coordination Platform can be accessed here: <https://www.cbitplatform.org>

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The project will use quarterly financial reports (to review the rate of progress of inputs), half yearly progress report and yearly Project Implementation Review (PIR). Its purpose is to assess project performance, to analyze whether the project is on track, what problems and challenges the project is encountering, and which corrective actions are required so that the project can achieve its intended outcomes by project completion in the most efficient and sustainable way. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented.

In-line with the with UNEP Evaluation Policy and the GEF Evaluation requirements, the project will be subject to an independent Terminal Evaluation. The Evaluation Office will be responsible for the Terminal Evaluation (TE) and will liaise with the project manager throughout the process.

The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. The project performance will be assessed against standard evaluation criteria using a six-point rating scheme. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP staff and implementing partners. The direct costs of the evaluation will be charged against the project evaluation budget. The TE will typically be initiated after the project's operational completion. If a follow-on phase of the project is envisaged, the timing of the evaluation will be discussed with the Evaluation Office to feed into the submission of the follow-on proposal.

The draft TE report will be sent by the Evaluation Office to project stakeholders for comment. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. The final determination of project ratings will be made by the Evaluation Office when the report is finalised. The evaluation report will be publicly disclosed and will be followed by a recommendation compliance process. The evaluation recommendations will be entered into a Recommendations Implementation Plan template by the Evaluation Office. Formal submission of the completed Recommendations Implementation Plan by the project manager is required within one month of its delivery to the project team. The Evaluation Office will monitor compliance with this plan every six months for a total period of 12 months from the finalisation of the Recommendations Implementation Plan.

The Task Manager will undertake a mid term review (MTR) if required based on the PIR assessment.

A summary of the planned M&E activities is provided in Annex J. The total GEF contribution for M&E activities (including the Inception and finalization Workshops, and the Terminal Evaluation) is US\$ 52,000. To that is added 20% of the Project's manager staff time for the preparation of reports and updates (this cost is listed under project management costs).

Co-partner agencies together with assigned consultants will response for managing and executing in each activity. Furthermore, this project will be managed in tripartite form which third party will be management unit. Besides, the project will have the project steering committee which responsible for overseeing completeness of each activity under the project.

Expenditure Description	Budgeted Amount (USD)
Estimated time of Project Manager in preparing Monitoring reports and organizing and conducting PSCs. (20% time)	11,520
Inception workshop and Final Workshop	17,000
Terminal Evaluation	35,000
Total	63,520

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCE/SCCF)?

Implementing the Enhanced Transparency Framework of the UNFCCC should help raise ambition and ultimately facilitate progress towards the ultimate objective of the UNFCCC Convention in terms of stabilizing the concentration of GHG gases in the atmosphere, thus reducing dangerous anthropogenic interference with the climate system and their impacts. This has become more evident following the results presented by the Intergovernmental Panel on Climate Change (IPCC) in October 2018 stating the urgency of climate action in the next following decades, in terms of avoiding the worse effects of changes in climate conditions at global and local level. At the global level, if Thailand complies with its NDC and is able to demonstrate it with a robust tracking system, it will effectively contribute with its share of mitigation of GHG emissions to the global common effort, as well as setting an example at the regional level and beyond. Moreover, this will also have important benefits in the areas of GHG inventory, mitigation, capacity building and tracking of finance. The design of a domestic tracking system for the NDC as well as the support received, and the innovative elements contained in this project, are not only coherent with the Article 13 of the PA related to transparency, but also with the NDC implementation and its periodical revision described in article 4.

Moreover, given the growing emphasis of development assistance on accountability, projects leading to increased transparency will likely facilitate access to additional funds (e.g. through the Green Climate Fund and others). At the national and local levels, a robust Transparency Framework for Climate in Thailand will also make more evident the benefits of the implementation of climate related projects at sub national level, allowing also for a better internalization of the climatic impacts posed by vulnerable communities of the country. Specifically, the engagement of stakeholders in AFOLU and specifically Agriculture may help visualize problems experienced by climate vulnerable communities throughout the country. In terms of subnational work, Components 1 and 4 have defined specific activities aimed at strengthening capacities at the local level and for non-state actors. This includes training activities aimed particularly with subnational officials. The compilation and use of activity data in AFOLU will be useful to improve the GHG Inventory of Thailand, strengthening also the implementation of mitigation measures at the subnational level.

In terms of adaptation benefits, Component 4 is specifically geared towards the effective integration of adaptation issues in climate change plans/measures/strategies, thus directly aiming at increasing the resilience of basic development in the areas of Agriculture. Climate change-induced impacts on Agriculture disproportionately affects the most vulnerable communities; a climate-resilient agricultural policy planning will bring benefits to these population groups.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification *

PIF	CEO Endorsement/Approval	MTR	TE
Low			

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

This is a low-risk project. However, UNEP ESSF guiding principles-- resilience and sustainability; human rights, gender equality and women empowerment, accountability and leave no one behind--are still applicable for low-risk projects. Project level grievance mechanism (if the government does not have such venue) should be established for any complaints to be handled swiftly at the project level

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
SRIF_CEOED_Thailand_201020	CEO Endorsement ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Project Objective	Objective level Indicators	Baseline	End of project Target	Means of Verification	Assumptions & Risks	UN Environment MTS reference
Strengthening Thailand's institutional and technical capacities to comply with the Enhanced Transparency Framework of the Paris Agreement	Indicator A: Quality of reporting and transparency mechanisms under the Paris Agreement (1. Low; 2. Medium; 3. High)	Baseline: Medium	End-of-project target: High	Reports/evaluations from the UNFCCC ? ICA ? 3rd Parties on Thailand?s submission within the Transparency Framework.	1) Risk of not implementing the project: low - Thailand has been continuously improving in its national capacities towards transparency since 2015. 2) Risk of COVID-19 disruption: low - the country has thus far dealt successfully with the pandemic	UNEP MTS 2018-2021 Climate Change Objective: Countries increasingly transition to low-emission economic development and enhance their adaptation and resilience to climate change
	Indicator B: Qualitative assessment of institutional capacity for transparency-related activities (as per CBIT programming directions, Annex IV)	Baseline: 2	End-of-project target: 3	Terminal Evaluation ratings against criteria set forth in CBIT Programming directions, Annex IV	1) Risk of not implementing the project: low - Thailand has been continuously improving in its national capacities towards transparency since 2015. 2) Risk of COVID-19 disruption: low - the country has thus far dealt successfully with the pandemic	UNEP MTS 2018-2021 Climate Change Objective: Countries increasingly transition to low-emission economic development and enhance their adaptation and resilience to climate change

	Indicator C: C1. Number of persons trained, and C2. percentage of persons trained that are women	Baseline: C1= 0; C2 = not known	End-of-project target: C1=120; C2=50%	Participant lists for all training and capacity building activities	Low level of risk - there is a high level of engagement for capacity building, and a comparatively high presence of women in the project institutions and sectors	UNEP MTS 2018-2021 Climate Change Objective: Countries increasingly transition to low-emission economic development and enhance their adaptation and resilience to climate change
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Project Outcomes	Outcome level Indicators	Baseline	End of project Target	Means of Verification	Assumptions & Risks	MTS Expected Accomplishment
Outcome 1: Thailand has the institutional and human capacities to regularly prepare accurate and transparent GHG inventories of the Agriculture, Forestry and Other Land Use (AFOLU) Sector through its national GHG inventory system	Indicator D: Quality of GHG inventories of sectors covered is improved (Based on the GEF 1-10 rating scale, outlined in Annex III of the CBIT's Programming Directions)	0	Agriculture, Forestry, Other Land Use, and Energy Sectors	Comparison between previous BUR and next BUR	1) Risk of not implementing the project: low - Thailand has been continuously improving in its national capacities towards transparency since 2015. 2) Risk of COVID-19 disruption: low - the country has thus far dealt successfully with the pandemic	Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies

<p>Outcome 2: Thailand's transparency framework enabled to track progress in implementing its mitigation action and report regularly as per Paris Agreement</p>	<p>Indicator E: Sectoral coverage of tracking progress in implementing mitigation actions and regularly reporting as per Paris Agreement enhanced</p>	<p>0</p>	<p>At least 1</p>	<p>Reports/evaluations from the UNFCCC ? ICA ? 3rd Parties on Thailand?s submission within the Transparency Framework.</p>	<p>1) Risk of not implementing the project: low - Thailand has been continuously improving in its national capacities towards transparency since 2015. 2) Risk of COVID-19 disruption: low - the country has thus far dealt successfully with the pandemic</p>	<p>Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies</p>
<p>Outcome 3: Thailand has systems and tools to effectively track international support received and report transparently as per international obligations</p>	<p>Indicator F: Quality of MRV of support received is enhanced (Based on the GEF 1-10 rating scale, outlined in Annex III of the CBIT?s Programming Directions)</p>	<p>0</p>	<p>at least 3</p>	<p>Reports from ONEP; BTR; NC reports</p>	<p>1) Risk of not implementing the project: low - Thailand has been continuously improving in its national capacities towards transparency since 2015. 2) Risk of COVID-19 disruption: low - the country has thus far dealt successfully with the pandemic</p>	<p>Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies</p>

Outcome 4: Thailand has tools and human capacities to monitor and evaluate adaptation actions and assess vulnerabilities to climate change, as well as use the information for adaptation policy development in the Agriculture sector	Indicator G: Secotral coverage of monitoring and evaluating adaptation actions and assessment of vulnerabilities to climate change is enlarged	Zero	1 (Agriculture)	Next BTR - Adaptation section	1) Risk of not implementing the project: low - Thailand has been continuously improving in its national capacities towards transparency since 2015. 2) Risk of spread of human epidemic such like Covid-19 might delay the timeline of project activities	Expected Accomplishment (b): Countries increasingly adopt and/or implement low greenhouse gas emission development strategies and invest in clean technologies
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ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

N/A

ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: 50,000 US\$			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (US\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent to date</i>	<i>Amount Committed</i>
International Consultant UDP	30,000	33,000	-
Local Consultant	10,000	14,500	-
Mission to Thailand	5,000	0	-

Stakeholder Workshops (2)	3, 500	2,100	-
Translation	1,500	400	-
Total	50,000	50,000	-

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

N/A

ANNEX E: Project Budget Table

Please attach a project budget table.

Page 99 - 101 in Project Document

ANNEX F: Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

ANNEX G: Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

ANNEX H: Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies? capacity and eligibility to administer NGI resources as

established in the Guidelines on the Project and Program Cycle Policy,
GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).