Terms of reference (ToR) for the procurement of services

Assessment on the Photosynthesis in Terrestrial Ecosystem

Project number: 20.2023.8.003.00

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I. General information

1. Brief information on the project

The project of ASEAN EU-German Climate Action Programme (CAP) aims to improve the capacity ASEAN to promote regional cooperation for implementing ambitious climate policies within the region. It is tasked to work together with other ASEAN sectoral bodies to implement climate policy initiatives. It needs to also establish or further develop exchange formats regarding the topic of NDCs for the purposes of policy dialogue. The agreed proposal even underline the area of focus that is of ASEAN cooperation on food, agriculture, and forestry. There is a need to enhance synergies among ASEAN sectoral bodies dealing with issues of climate change, and specifically with mainstreaming climate change into sectoral development. This is to ensure climate policies are impactful to assist sectors in mitigating and adapting with climate change impacts.

With the development of policies following countries' commitment to Sustainable Development Goals and Paris Agreement, such as EU Green Deal and green recovery, there is a need to enhance the understanding of the latest findings on their implications to the region. Climate policies and implications that are relevant for policymakers in Southeast Asia would need to be elaborated. There is a need to identify key interlinkages, impacts, and consequences of climate change for the region and its countries, as well as the opportunities and challenges for climate mitigation and adaptation due to certain international climate policies. Furthermore, there is a need to assess alignment and gaps between climate policies and frameworks on climate change and its impacts to certain sectors for enhancing ASEAN collective responses and actions.

2. Context

The Land Use, Land-Use Change, and Forestry (LULUCF) sector is important for climate change mitigation as it has the potential to reduce greenhouse gas (GHG) emissions and sequester carbon. Land use and forestry as intricately linked to how and where people live and sustain, and LULUCF measures can also provide global environmental benefits, including in Southeast Asia region.

In ASEAN region, significant amount of land transformation caused by human activities, exacerbates the impact of climate change. These impacts are also compounded by natural disasters such as extreme weather, drought, and flood. The Intergovernmental Panel on Climate Change (IPCC) 6th assessment report presented that the Agriculture, Forestry and Other Land Use (AFOLU) sector accounted for 13-21% of global total anthropogenic GHG emission in the period 2000-2019. Meanwhile, Land use change drives net AFOLU CO2 emission fluxes, with deforestation being responsible for 45% of total AFOLU emission. Data from Houghton (2008) showed carbon flux from deforestation and other land-use change activities attributed to CO2 emission to the atmosphere (Figure 1).

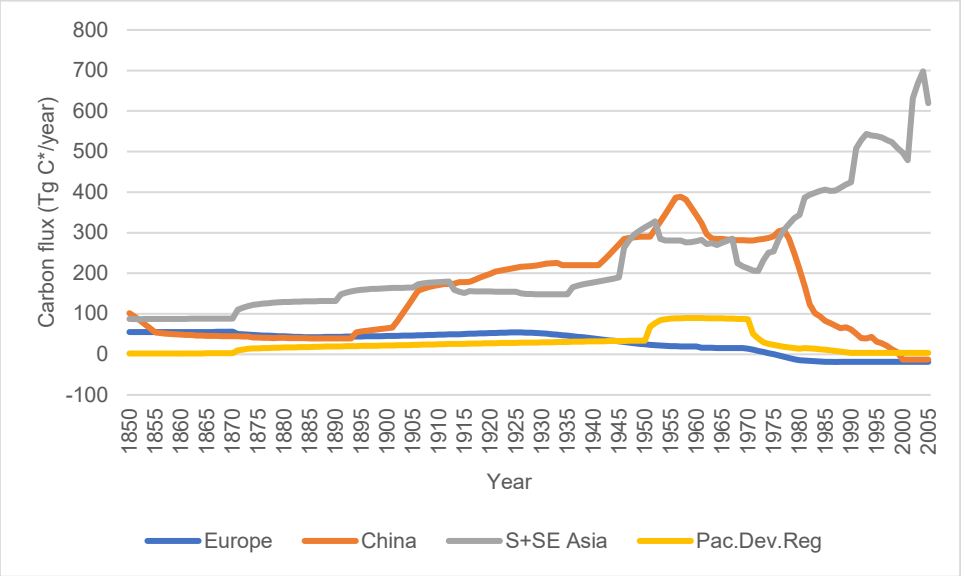

Figure 1. Annual Net Flux of Carbon from Land Use Changes, 1850-2000.
**: teragram carbon; 1 teragram = 10^{12} gram)*

ASEAN Member States (AMS) have challenges to work on climate at national and regional levels, and ASEAN has opportunities to improve the situation. The Paris Agreement (PA) on climate change rests upon a foundation of Nationally Determined Contributions (NDCs) which reflect the national plans and pledges individual countries have made to meet the universal goal of keeping global temperature increases to well below 2°C above pre-industrial levels by reducing greenhouse gas (GHG) emissions and build resilience to the impact of climate change. Even though all Member States of the ASEAN have signed and ratified the PA and formulated their NDCs accordingly, the progress still seems to be slow and scattered (Overland, et al., 2021). ASEAN Secretariat (2021) recognized the dual challenges faced by the AMS to meet reporting requirements under the Enhanced Transparency Framework (ETF) and to make progress towards the ambition of the PA goals. In this complex situation, ASEAN can actually demonstrate its leadership in the region by serving as a dialogue and cooperation platform, injecting political momentum and thus playing a key role as an intermediary between international and national climate policy processes (Caballero-Anthony, 2012).

To tackle such situation, climate change adaptation and mitigation plans and policy actions, indeed, are needed, and intrinsically connected. However, both policy measures have been handled separately, due to differences in priorities and levels of coordinating action for the measures, planning and implementation. The type of knowledge needed to inform adaptation and mitigation policies is also different. Nonetheless, there is a growing argument that synergistic approaches to adaptation and mitigation could bring substantial benefits at multiple scales (Duguma, Minang, & Noordwijk, 2014) in a long-term and wider political support. To achieve holistic actions, a coherent and coordinated approach is crucial for exploring the synergies and trade-offs between adaptation and mitigation and realising integrated solutions.

In the context of climate change, sub-national governments and authorities are the main actors translating policy into various actions. multi-level climate governance provides an interface for policy-making decision processes, and at the same time it functions as a reinforcing mechanism and an enabler of actions. Multi-level climate governance simultaneously involves both top-down processes and bottom-up

processes, thus it involves inter-sectoral, multi-actor and multi-dimensional processes related to climate change mitigation and adaptation policies. A multi-level climate governance framework, therefore, can be used to coordinate the interactions of actors (vertically and horizontally) at various levels to translate climate adaptation and mitigation policies into implementation well.

The GIZ ASEAN-German CAP cooperates closely with the ASEAN Secretariat and the AWGCC on strengthening ASEAN structures and processes to make climate policy more effective and contributes to anchoring climate policy issues more systematically in ASEAN policy documents and its visibility at international forums Moreover, the need for capacity building training has been reflected in the ASEAN Working Group on Climate Change (AWGCC) Action Plan 2019-2025.

Considering the necessity of capacity development, we, GIZ, recognise the involvement of expert to provide substantial supports to the project's outputs, hence, collaborating with selected consultant is essential. Through this call, GIZ is looking for technical support to measuring atmospheric changes through land use change. In particular, the reduction of oxygen production caused by land use change shall be calculated.

3. GIZ shall hire the contractor for the anticipated contract term, **from 3 April 2024 to 30 September 2024**.

4. The contractor shall provide the following work/service:

   1) <u>To develop a table with terrestrial ecosystems and the related oxygen production.</u>

      Each ecosystem (i.e. peatland, mangroves, diverse forests) provides several services like groundwater recharge, carbon sequestration, etc. The contractor shall focus on oxygen production of the terrestrial ecosystems and calculate the volumes produced by each type of ecosystems. He/she shall calculate the produced oxygen volumes for each ecosystem under diverse scenarios, i.e. perfect (i.e. sufficient water), affected (i.e. floods, droughts) and bad conditions (i.e. long droughts, wildfires).

2) <u>To assess the oxygen production and other major services and costs economically and financially.</u>The oxygen production of ecosystems is not assessed widely yet. The focus of this analysis will lay on oxygen and the production of oxygen per ecosystem and per hectare.

with detailed working tasks based on topics of training as follows:

Task 1: To develop a table with terrestrial ecosystems and the related oxygen production

In coordination with CAP team, this task is including but not limited to:

1) Listing the most relevant type of terrestrial ecosystems in SEA. Note: spatial mapping and quantification of land cover with defined ecosystems is not necessary.
2) Description of the identified ecosystems, which includes the provided services.
3) Quantification of carbon sequestration rate, water need and oxygen production of each ecosystem per defined ecosystem and per hectare.
4) Development of the scenarios: definition of good/affected/bad conditions.
5) Quantification of the carbon sequestration rate, water needs and oxygen production per hectare.

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Deliverables: (1) List with ecosystems, (2) Handbook with technical description of ecosystems, (3) File with data and quantification. All deliverables are presented in the format of files.

Task 2: To assess the oxygen production and other major services and costs economically and financially
This task is to assess the services and costs of terrestrial ecosystems economically and financially. Detailed task is including but not limited to:

1) Method: Oxygen is produced in terrestrial ecosystems through the photosynthesis. The equation $6CO_2+6H_2O \rightarrow C_6H_{12}O_6+6O_2$ is the basis for the economic and financial assessment. The contractor will apply method(s) to assess the volumes for each parameter and to valuate these volumes.
2) Scenario analysis: the contractor will develop and describe three scenarios, which should reflect good, average/affected, and bad conditions.
3) The volumes of the relevant parameter will be quantified for each scenario and defined/selected ecosystem, which are then economically assessed and financially evaluated.

Deliverables: (1) Document with the Description of the applied methods (2) Document with the described scenarios, (3) File with all calculations.

The timeline of achieving milestones, as laid out in the table below, are to be chieved during the contract term:

Milestones	**Timeline**
Task 1. To develop a table with terrestrial ecosystems and the related oxygen production	April 2024
Task 2. To assess the oxygen production and other major services and costs economically and financially	May 2024

II. Tender requirements

1. Qualifications of proposed staff

1.1. Expert 1:

1.1.1. General qualifications

Education: University degree (master's or above) in climate change, biology, environmental management, natural resources management, or another relevant field of study.

Professional experience: 15 years of professional experience in the climate change and environmental management, with specific professional experience in applied biology and development projects.

1.1.2. Experience in the region/knowledge of the country

10 years of experience in projects in Southeast Asia (region).

1.1.3. Language skills

business fluency in English with C1-level in the Common European framework

of reference

In addition to their specialist qualifications, the following qualifications are required of expert members:

- Team skills
- Initiative
- Communication skills
- Socio-cultural skills
- Efficient, partner- and client-focused working methods
- Interdisciplinary thinking

2. Quantitative Requirements

Fee days	Number of experts	Number of days per expert	Comments
Expert 1	1	35	against timesheet
Other costs	**Number of experts**	**Amount**	**Comments**
Flexible remuneration	1	IDR 23.800.000	Use of the flexible remuneration item requires prior written approval from GIZ.

Calculate your financial bid exactly in line with the quantitative requirements of the specification of inputs above. There is no contractual right to use up the full days. The number of days and the budgets will be contractually agreed as maximum amounts. The specifications for pricing are defined in the price schedule.

3. Conceptual design

The tender should indicate how the services outlined in Section I.4 (Tasks) and will be evaluated based on the appropriateness within the following criteria:

3.1 Understanding scope of work and output
The tender must describe working strategy for delivering the service put out to tender.

3.2 In-depth elaboration of the implementation plan: robust methodology, work steps, milestones, and schedules
The tender must provide an overview of the robust methodology and working timeline with each milestone according to the terms and reference.

III. Requirements on the format of the tender

The CV submitted has a maximum of four pages. It must clearly show the position and job the expert held in the reference project and for how long. The CV must be submitted in English.

The conceptual design (section II.3) should not exceed five pages. If one of the maximum page lengths is exceeded, the content appearing after the cut-off point will not be included in the assessment. It must be drawn up in English. External content (e.g. links to websites) will also not be considered.