Greater Cairo Air Pollution Management and Climate Change Project

Component 1: Enhancing the Air Quality Management (AQM) & Response System

Technical Implementation Unit (TIU)

TERMS OF REFERENCE

FOR

DEVELOPMENT OF A PROFESSIONAL MASTER'S DEGREE PROGRAM ADDRESSING AIR POLLUTION/CLIMATE CHANGE AND WASTE MANAGEMENT

April 2025

Greater Cairo Air Pollution Management and Climate Change Project

Terms of Reference

For hiring an Environmental Firm/Institution to provide technical support to develop a professional master's program addressing Air Quality/Climate Change and Waste Management

Technical Implementation Unit (TIU)
Component 1: Enhancing the Air Quality Management (AQM) & Response System

1. Background

As part of the "Sustainable Development Strategy (SDS): Egypt Vision 2030",[1] the country committed to halving its fine particulate matter (PM_{10}) air pollution by 2030. Significant improvements have been made towards that goal in recent years. In fact, Cairo's PM_{10} concentration fell by about 25 percent over the past decade. Despite these improvements, the city's pollution levels are still several times the WHO recommended concentrations and higher than national guidelines taking as these high levels are taking their toll on the health and quality of life of the population, in particular poor people. Subsequently, the Greater Cairo (GC) Cost of Environmental Degradation (COED) attributed to air pollution is by far the highest in the country, with a mean estimate equivalent to 1.35 percent of national GDP in 2017. Conversely, the GC COED attributed to waste (net of air pollution damages, via the burning of waste) is half the air pollution's COED and results in a mean estimate equivalent to 0.68 percent of national GDP in 2017 which includes the opportunity losses from composting, recycling, methane capture, etc. Moreover, recent studies on the COVID-19 show that there is an increased likelihood of contracting the disease with high levels of ambient pollutants.[2]

Climate change models project Egypt's mean annual temperature to increase between 2 ºC and 3 ºC by 2050 and an increase in the duration of long-lasting heatwaves. Hot sandstorms known as khamsin blow millions of tons of grit from the Sahara to the North African coast and increases in local temperatures of up to 20 ºC are projected to increase in frequency and intensity. By 2050 the intensity and seasonality of heavy rains, as well as the probability of droughts will increase. Long-lasting heatwaves likely will increase in duration of between 9 to 77 days by 2085. The GC area is vulnerable to all of these, as well as to river and urban flooding, water scarcity and wildfires.

[1] http://www.cabinet.gov.eg/English/GovernmentStrategy/Pages/Egypt%E2%80%99sVision2030.aspx and https://www.greengrowthknowledge.org/sites/default/files/downloads/policy-database/Egypt%20Vision%202030%20%28English%29.pdf.

[2] Larsen, Bjorn. 2019. Egypt: Cost of Environmental Degradation: Air and Water Pollution. The World Bank. Washington, D.C.; and Back of the envelop calculations for cost of solid waste environmental degradation performed by the Team.

The impacts are severe, particularly for public health and agriculture. Climate change will put additional pressures on citizens' health, in the form of increases in the prevalence and severity of cardiopulmonary conditions through heat and sandstorms, potential increases in vector-borne diseases, through decreased nutrition and food security and reduced water quality. Further, it has been demonstrated that extreme heat events are linked to worsening air pollution.[3]

In response to this situation, the Government of Egypt (GOI) is seeking to reduce air and climate emissions from critical sectors and increase resilience to air pollution in Greater Cairo. The Ministry of Environment is in that respect implementing, with the support of the World Bank, the "Greater Cairo Air Pollution Management and Climate Change Project".

The Project aims specifically to reduce emissions that contribute to air pollution concentrations, thus leading to air quality improvements, and to simultaneously mitigate climate change. Air pollutants include PM_{10} and $PM_{2.5}$, while climate pollutants include both longer lived greenhouse gases (GHGs) such as CO_2, as well as Short-lived Climate Pollutants (SLCPs) that include black carbon, methane and several short-lived HFCs.

The Project is composed of the following 5 components:
Component 1: Enhancing the Air Quality Management (AQM) & Response System.
Component 2: Support the operationalization of SWM Master Plans in GC.
Component 3 Vehicle Emission Reduction.
Component 4 Communication & Stakeholders Engagement.
Component 5: Project Management and Monitoring & Evaluation.
Component 6: Improved E-waste and Healthcare (HCW) Management for Reduction of uPOPS

(For more information: https://projects.worldbank.org/en/projects-operations/project-detail/P172548)

This assignment is requested in the context of **Component 1: Enhancing the Air Quality Management & Response System:** This component will support the enhancement of the Air Quality Management (AQM) decision support system in GC through a strengthened AQM infrastructure (monitoring and analytical), capacity building activities, developing emergency response plans and raising public awareness through information dissemination.

The Consultant's assignment is related to the following Sub-task under Component # 1: "Support the development of an integrated system for having qualified cadres to work in the environment field (green Jobs), including developing University Curriculum"

The Developmental Goal of the Assignment is to "Establish an enabling environment to sustain a pool of Egyptian environmental professionals covering the areas of environmental sciences, environmental engineering, climate change, and air pollution while ensuring a continual supply of candidates".

[3]Markandya and Chiabai, Valuing Climate Change Impacts on Human Health: Empirical Evidence from the Literature, Int. J. Environ. Res. Public Health, 6, 759–86, 2009.

2. Project implementation arrangements:

A Project Coordination Unit (PCU) has been established at the MoE. The PCU ensures that the Project is implemented in accordance with the Legal Agreement signed between the GoE and the World Bank, the Project Appraisal Document (PAD), the Project Implementation Manuals (Project Operational Manual, M&E Manual, etc.).

Four Technical Implementation Units (TIUs) have also been established to oversee the implementation of all components. The TIU for Component 1 is chaired by the Head of the Environmental Quality Sector of the Egyptian Environmental Affairs Agency (EEAA) and includes members of the different departments of the sector.

3. Objective of the consultancy

The project seeks to hire a reputable firm/academic institution (referred hereafter as the CONSULTANT) to develop a professional master's program in Egypt that focuses on two critical and interrelated environmental issues: Air Pollution/Climate Change and Waste Management. The goal is to create an advanced, interdisciplinary program that equips graduates with the knowledge, skills, and expertise necessary to address environmental challenges in the context of the triple planetary crisis, policy-making, and sustainable development.

The program should blend academic rigor with practical application necessary for future green jobs, while catering to a broad audience including government officials, industry professionals, researchers, and those working in environmental advocacy and policy.

4. Scope of Work and Specific Tasks

The successful CONSULTANT will be responsible for the development of a comprehensive professional master's program that integrates theoretical knowledge with practical expertise in the fields of 1) Air Pollution/Climate Change and 2) Waste Management. This includes designing curriculum, defining learning outcomes, proposing course structures, recommending teaching methodologies, and outlining the program's implementation strategy.

The CONSULTANT's scope of work includes the following tasks:

4.1 Curriculum Development

- Review of existing curriculum, to identify gaps that would be bridged through the development of the new program that meets the international standards. The successful CONSULTANT will be provided with information already gathered by the project, including the modules developed by the MEC-NAREMAN Program under the "Enhancing National Capacities for Improved Public Participation for Implementing Rio Conventions (CB3 Project)" carried out by the MoE, UNEP and GEF. The Consultant should make use of such modules as much as the contents allow.
- Program Structure: Develop a comprehensive and balanced curriculum that combines:

- Core courses
- Elective courses
- Employability competencies
- Practical modules, such as field visits, internships, and case studies, to provide real-world experience

- Skills needs assessment: Conduct skills' needs assessment with EEAA (for air quality management and climate change issues) and Waste Management Regulatory Authority (MWRA) (for waste management issues) to identify specific skills requirements for the graduates linked to job markets and national professional needs. The CONSULTANT shall also engage key stakeholders, including industry leaders, policymakers, academic experts, and relevant organizations.

4.2 Learning Outcomes: Define clear, measurable learning outcomes for each course and for the overall program. Ensure that the program meets academic standards while also preparing graduates for professional challenges.

4.3 Capstone Project/Thesis: Curriculum development shall include a capstone project or thesis requirement that encourages practical problem-solving in real-world contexts, either through research or by collaborating with industry partners or governmental agencies. Projects or theses shall focus on air quality, climate change or waste management.

4.4 Program Design and Delivery

Mode of Delivery: Recommend a flexible mode of delivery (e.g., face-to-face, online, or hybrid) that accommodates working professionals and be appealing to a wide range of audiences. Propose an appropriate blend of synchronous and asynchronous learning. Online delivery usually involves Teams interface between teachers/lecturers and the students.

4.5 Teaching Methods: Recommend innovative pedagogical approaches and techniques to enhance student engagement and learning outcomes.

4.6 Assessment Strategy: Design an assessment framework for the program, including formative and summative assessments such as exams, assignments, group work, presentations, and practical evaluations.

4.7 Faculty and Resource Planning

- Faculty Requirements: Identify qualifications and experience required for the faculty, and recommendations for recruitment or training. Ensure faculty members possess both academic credentials and professional experience in the fields of Air Pollution/Climate Change and Waste Management.
- Resource Needs: Recommend necessary resources such as textbooks, software, lab facilities, and online platforms. Provide a plan for how the institution can build or enhance infrastructure to support the program.

4.8 Accreditation and Regulatory Compliance

- Accreditation Strategy: Advise on the accreditation process for the program, including the specific requirements of the National Authority for Quality Assurance and Accreditation (Naqaae) and ensuring that the program meets national (e.g. National Qualification Framework) and international standards.
- Compliance with Standards: Ensure that the program complies with relevant national regulations and international standards for environmental education. This includes aligning the program with recognized competency frameworks (e.g. National Qualification Framework) and national environmental, climate, waste and sustainability strategies.

4.9 Budget and Implementation Plan

- Budgeting: Develop a detailed budget for the program, including costs for marketing, faculty recruitment, resources, and infrastructure.
- Resource Needs: Recommend necessary resources such as textbooks, software, lab facilities, and online platforms. Provide a plan for how the institution can build or enhance infrastructure to support the program.

4.10 Implementation Timeline: Provide a realistic timeline for the development and launch of the program, outlining key milestones such as curriculum finalization, accreditation, marketing, faculty selection criteria, and the first cohort's intake.

4.11 Target Audience Identification: Define target audiences for the program, including new graduates, mid-career professionals, government employees, private sector actors, and potential students from the MENA region.

4.12 Program Evaluation and Sustainability

- Evaluation Framework: Propose mechanisms for monitoring and evaluating the effectiveness of the program over time, including student feedback, graduate success rates, and employer satisfaction surveys.
- Sustainability Plan: Suggest strategies for the long-term sustainability of the program, including funding opportunities, partnerships, and continual program updates to stay relevant to changing environmental challenges and technological advancement.

5 Deliverables

The CONSULTANT is expected to deliver the following key outputs:

Deliverables	**Timeframe (From contract signature)**
Inception Report: Detailing the approach, methodology, identified skills requirements and timeline for completing the consultancy.	2 months
Curriculum Design Report:	6 months

- Detailed outline of the program structure, learning outcomes, and complete course file for each module. - Program Delivery Plan: Including details of program delivery modes, assessment strategies, and teaching methodologies.	
Supporting Requirements: - Faculty and Resource Recommendations - Accreditation and Compliance Plan - Marketing and Recruitment Strategy - Implementation Plan - Program Evaluation and Sustainability Plan	7 months

6 Expertise Required

The successful CONSULTANT TEAM should demonstrate:

- Expertise in designing academic programs related to environmental sciences, sustainability, climate change, air pollution, and waste management.
- Experience in curriculum development for professional master's programs.
- Knowledge of accreditation processes and environmental regulatory frameworks.
- Proven ability to deliver high-quality reports and recommendations.
- Ability to engage with diverse stakeholders, including government, industry, academia, and civil society organizations.
- Demonstrated ability to communicate fluently in English and Arabic languages.
- The Consultant Team shall include the following expertise as a minimum:
    - Innovative multidisciplinary pedagogical methods expert
    - Curriculum development expert
    - Environmental science expert
    - Air quality management expert
    - Climate change expert
    - Waste management expert

7 Administrative Arrangements and Coordination

The Consultant will work under the supervision of, and report to the Head of the Environmental Quality Sector, EEAA, in her capacity as the Head of the Technical Implementation Unit (TIU) of Component # 1 of the Project, and/or her designee, with the Lead Advisor of the Component and the Task Advisor. Contract management and other administrative responsibilities are overseen by the Project Coordinator of the Greater Cairo Air Pollution Management and Climate Change Project, or his designee.

The consultant will work closely with EEAA staff members of the TIU, Cairo University focal point and other stakeholders/partners may be also involved in consultation with the TIU/EEAA.

8 Duration of Consultancy

The expected duration of the consultancy is **SEVEN [7]** months.

It is expected that the consultant will work to complete the deliverables between July 1st and January 30th, 2026.

9 Reporting

The CONSULTANT will report directly to and work under the supervision of the Head of the Environment Quality Sector of EEAA. Regular updates and progress meetings will be required throughout the consultancy period.

All reports should be delivered to EEAA in hard and electronic (editable) copies.

All reports will include a summary and be written in English with an Arabic translation. Reports would be prepared initially in draft and finalized within an agreed upon period following receipt of comments from EEAA. Application and Selection Process