CLEAN AIR FOR BLUE SKY ASIA ENGAGEMENT FACILITY Evaluation Report
CABSA Phase I and CABSA Phase II

Evaluator: Maria Onestini

December 2024

NAME OF THE EVALUATION INTERVENTION:

CLEAN AIR FOR BLUE SKY ASIA

ENGAGEMENT FACILITY (PHASE 1 AND PHASE 2)

TIME FRAME OF THE EVALUATION AND DATE OF THE REPORT COUNTRIES OF THE EVALUATION INTERVENTION:

PHASE 1: THAILAND, LAO PDR AND CAMBODIA

PHASE 2: INDONESIA, MONGOLIA AND VIETNAM

TIME FRAME OF THE EVALUATION: AUGUST TO DECEMBER 2024

NAME OF EVALUATOR: MARIA ONESTINI

NAME OF THE ORGANIZATION COMMISSIONING THE EVALUATION: UNDP

ACKNOWLEDGEMENTS:

THE EVALUATOR WOULD LIKE TO ACKNOWLEDGE AND THANK ALL WHO KINDLY SHARED THEIR TIME, INFORMATION, AND INPUTS FOR THE INTERVIEWS AND CONSULTATIONS THAT TOOK PLACE AS PART OF THIS PROCESS.

I. PROJECT AND EVALUATION INFORMATION

<table>
<tr><th>Project Title</th><td>CLEAN AIR FOR BLUE SKY ASIA ENGAGEMENT FACILITY (Phase I and Phase II)</td></tr>
<tr><td>Linkage to the UNDP Strategic Plan (2022-2025) Outcome:</td><td>SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions</td></tr>
<tr><td>Links to Regional Programme Outputs (2022-2025):</td><td>RPD Output 1.4: Sustainable, scalable and innovative solutions and strategies for Nature, Climate and Energy transformation strengthened through enhanced Climate Promise, nature-based solutions, and transitioning to clean energy and zero-carbon development.</td></tr>
<tr><td>Indicative Project Output(s) with gender marker:</td><td>CABSA I and II:
Output 1: Phase 1 of Asian Air Quality Monitoring Platform prototype (GEN1)
Output 2: Science-based air quality modelling developed, and solutions identified to address regional pollution challenges (GEN1)
Output 3: A portfolio of actions and initiatives to improve regional air pollution management and policy measures (GEN1)
All outputs are GEN I during CABSA I. Output 2 and 3 have been upgraded to GEN 2 during the design of CABSA II, incorporating gender inclusive indicators.</td></tr>
<tr><td>Quantum Project ID</td><td>CABSA I: 00132938 CABSA II: 01002432</td></tr>
<tr><td>Total budget (USD):</td><td>CABSA I: $ 419,181.75 CABSA II: $ 415,150</td></tr>
<tr><td>Countries</td><td>CABSA I: THAILAND, LAO PDR AND CAMBODIA
CABSA II: INDONESIA, MONGOLIA AND VIETNAM</td></tr>
<tr><td>Region</td><td>Asia and the Pacific</td></tr>
<tr><td>Expenditure at the time of evaluation (USD)</td><td>CABSA I
<table>
<tr><th>Year</th><th>Project ID 132938</th></tr>
<tr><td>2022</td><td>32,462</td></tr>
<tr><td>2023</td><td>177,362</td></tr>
<tr><td>2024 (as of 4 November 2024)</td><td>87,742</td></tr>
<tr><td>Total</td><td>297,566</td></tr>
</table>
CABSA II
<table>
<tr><th>Year</th><th>Project ID 132938</th></tr>
<tr><td>2024 (as of 4 November 2024)</td><td>69,400</td></tr>
<tr><td>Total</td><td>69,400</td></tr>
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<tr><td>Funding Source:</td><td>Republic of Korea/Ministry of Environment for both CABSA I and II</td></tr>
<tr><td>Implementing Entity:</td><td>UNDP Bangkok Regional Hub</td></tr>
<tr><td>Project Start and End Date:</td><td>CABSA I: 28 April 2022-31 December 2024
CABSA II: 25 April 2024-28 February 2027</td></tr>
<tr><td>PAC Meeting Date:</td><td>n/a</td></tr>
<tr><td>ProDoc Signature Date:</td><td>CABSA I: 28 April 2022
CABSA II: 25 April 2024</td></tr>
</table>

Evaluation information		
Evaluation type	Project	
Final/midterm review/ other	Final for Phase I	
Period under evaluation	Start	End
	April 2022	August 2024
Evaluator(s)	Maria ONESTINI	
Evaluator email address	Onestinimaria59@gmail.com	
Evaluation dates	Start: August 2024	Completion: December 2024

TABLE OF CONTENTS

II. List of Acronyms and abbreviations

AAQMAP	Asian Air Quality Management Program
AQM	Air Quality Modelling
BAU	Business-as-usual
CABSA	Clean Air for Blue Sky in Asia
CO	Country Office
DIM	Direct Implementation Modality
EDGAR	Emissions Database for Global Atmospheric Research
GEMS	Geostationary Environment Monitoring Spectrometer
GSM	General Management Support
INU	Incheon National University
IP	Implementing Partner
LNOB	Leave No One Behind
LoA	Letter of Agreement
MOE	Ministry of Environment of the Republic of Korea
NGOs	Non-profit Governmental Organizations
OECD	Organization for Economic Cooperation and Development
RBAP	UNDP Regional Bureau for Asia and the Pacific
RP	Responsible Parties
SDGs	Sustainable Development Goals
SSTC	South-South and Triangular Cooperation
ToR	Terms of Reference
UNDP	United Nations Development Programme
USD	United States Dollars

III. DISCLAIMER

The agreement between UNDP and Ministry of Environment, the Republic of Korea was signed on 13 December 2021 to establish a framework of cooperation with respect to the project on Clean Air for Blue Sky Asia (CABSA) project with the objective to improve air quality and public health of the people and communities in Asia. As per the signed Engagement Facility Concept note for CABSA I, the project envisions 4 phases with CABSA I piloted through Engagement Facility including Cambodia, Lao PDR and Thailand during 13 December 2021-13 December 2024.

On 2 June 2023, UNDP and Ministry of Environment, the Republic of Korea signed an agreement for CABSA phase II, which covers Indonesia, Mongolia and Vietnam, with implementation during 25 April 2024 to 28 February 2027. The project has also been implemented through UNDP Engagement Facility.

Given addressing air pollution was a relatively new area of collaboration between UNDP and the Republic of Korea, Engagement Facility[1] was a selected programming instrument to test this new collaborative initiative to assess potential for scale-up. With the Engagement Facility, the project was able to take off on implementation quite rapidly and engaged subject matter expertise to identify air quality information gaps, to build a prototype Asian Air Quality Management Programme and to test the simulation in selected country (3 countries for phase I and additional 3 countries in phase II as mentioned above) on a timely manner. However, with a light set-up i.e. only indicators, baselines and targets required as opposed to a full-fledge results and monitoring frameworks, both CABSA phase I and II witness flaws in design which later demonstrate through limited scientific-based results during implementation. Though the project objective, outcomes and activities are clearly articulated, there is a lack of meaningful indicators which could have helped the project to achieve the intended social, policy-related impacts as well as gender and vulnerable group inclusivity. The absence of comprehensive theory of change and results and monitoring frameworks also made evaluation of this project a non-conventional one.

Therefore, the evaluation of CABSA phase I and II, as Engagement Facility, could not fully adhere to the requirements typically applied to standard UNDP development projects. The objective of this evaluation is to assess relevance, effectiveness, efficiency and sustainability to primarily assist UNDP, the project team in particular, to come up with course correction during the implementation of CABSA phase II and the design of the future CABSA projects.

[1] PPM_Design_Engagement Facility.docx

Furthermore, be stated that the analysis and recommendations contained in this document only represent the author's analysis, and do not necessarily reflect the views and opinions of the United Nations Development Programme (UNDP) nor any other UN Agency, nor of the Donor.

IV. EXECUTIVE SUMMARY

This project was developed with the understanding that air pollution control must be based upon sound scientific research and data, as well as upon monitoring and forecasting. The CABSA project in its Phase I work focused on the Lower Mekong Countries, to reinforce regional air pollution monitoring and forecasting capabilities. UNDP, through the Regional Bureau for Asia and the Pacific (RBAP), with support from Ministry of Environment (MOE), the Government of Korea, supported the Asia-Pacific region (with Thailand, Lao PDR and Cambodia as piloting countries in Phase I) to tackle air pollution by introducing a prototype Asian Air Quality Management Program (AAQMaP). CABSA Phase II, is an expansion of the first phase of this project (covering Indonesia, Mongolia and Vietnam) in collaborative efforts to tackle regional air pollution challenges. The aim is also to update the AAQMaP and its associated modelling to continue to stimulate governments' decisions on policies and investments that promote a cleaner, greener environment. The overall objective of the project is geared to accelerate structural transformations for sustainable development through multi- stakeholder partnerships within and across government and society. The specific objective is *"Improved, transparent, accurate, and efficient air quality data platform to inform government's investment decisions that promote a cleaner, greener environment*." The outputs expected to be achieved through several activities, for both phases, are as follows:

Output 1: Air quality information gap is addressed in targeted countries through a prototype AAQMaP;

Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models; and

Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up and catalysed.

The overall objective of this evaluation, for CABSA Phase I, is to promote accountability and transparency and assesses the extent of project accomplishments. For CABSA Phase II, the objective is to have the evaluation findings and recommendations help guide course corrections and adaptive management in the early year of implementation. And, for the potential third phase, the purpose/objective is to provide recommendations for this potential next project. The criteria the evaluation used to fulfil the above objectives and assess performance and the rationale behind them are as follows: relevance/coherence, efficiency and effectiveness

(results/achievements towards objective and expected outcome), and sustainability (financial, socio-economic, institutional framework and governance).

The evaluation was also intended to promote accountability and transparency and assesses the extent of project accomplishments. The primary audience or users of the evaluation are UNDP (in particular UNDP's Regional Hub in Bangkok) and donor or potential donors. The evaluation audience intends to learn from this evaluation the strengths, challenges and achievements of the CABSA project to generate new interventions that are integrated and proactive in the developmental field, especially regarding air pollution in the Asia Pacific region.

The evaluation approach was participatory and consultative ensuring close engagement with key stakeholders and partners as much as possible, not only in the data gathering aspects but also in the presentations and validation processes. This assessment did use a variety of multiple information and data sources (primary, secondary, qualitative, quantitative, etc.) extracted from document analysis and desk review as well as online/telephone interviews. The approach entailed the collection and analysis of both qualitative and quantitative data, to validate and triangulate information so that methodologies implemented through specific tools feed into each other and are mutually supportive to validate information. The evaluation process used gender-responsive methodologies and tools and ensure that gender equality and women's empowerment, as well as other cross-cutting issues and SDGs, as or if they incorporated as relevant to the project. The gender-responsive evaluation assessed how (or if) gender issues are included in the project (from design/planning to implementation processes) and provided information on the way in which the project is or will be affecting women and men differently and how women are included in the project within a rights framework. Gender related questions were included in guiding questions as well as in questionnaires. However, the most important gender related analysis is done by this assessment when judging design comparatively (that is comparing Phase I with Phase II) and when analysing whether gender differentiated issues regarding air pollution are addressed by the project in its already implemented phase as well as in the projection of future phase(s). The sources of data used were all documents generated by the project as well as engaging with the universe of stakeholders that participated in the project.

The first phase of this intervention was framed with the intention of expanding to a much broader endeavour to deal with air pollution in Asia Pacific, which is –as is well known-- a key problematic issue in the region. Overall, CABSA Phase I has been a positive undertaking given that its planned and unplanned outputs (data harnessed, research, inter country relations, technical exchanges, etc.) can be used as a baseline jumping point not only for Phase II but also for a more outcome oriented broader development project. Through the comprehensive

collection of air quality monitoring data from each country involved in the first phase, providing a detailed overview of pollutant levels in various regions, this data allows for the identification and pinpointing of main sources of air contamination and trends. Data also allows the development of air pollution emission reduction scenarios for partner countries and quantitatively analyses the reduction effects, providing scientific evidence needed to establish effective air quality improvement strategies. Besides data gathered and analysis on air quality monitoring, air emission inventories, and analysis of satellite data, and policy intervention scenario/policy analysis, the project engaged in workshops and generated the prototype AAQMaP system.

In summary, the data gathered by the concluded phase and what is expected to be gathered in the new implementation second phase can be considered keystone information sources to engender a proactive and much needed larger project in scope that could aid in the control of air pollution in the Asia Pacific region. The potential effectiveness of what has been achieved in the first CABSA phase is high if new phases are designed and resources are leveraged that can broaden scope to be an integrated project that deals with one of the most salient problems in Asia Pacific (that is, with air pollution) in an integrated manner and dealing with the numerous issues affected and affecting by air contamination.

As such, it is concluded by this assessment that the project has met with evaluation criteria as follows:

- The project has been relevant in two aspects. First, in the sheer materiality of dealing with what is one of the most acute environmental issues for the Asia Pacific region. That is, for dealing with air pollution in a sustainable development context whereby it is clear that the level and perseverance of air contamination is not only affecting variables such as human and ecosystem health but also undermining development achievements made by the countries involved and affected. Second (and in part due the gravity of the issue) the intervention is coherently aligned with relevant international, regional and national policies and mandates.
- The project has been efficiently implemented in the sense that it achieved the expected outputs in a timely manner and within the predicted time frame.
- The effectiveness of the project outputs (which involved mainly research) are a matter to see at future. The project was designed to produce outputs, and the outcomes that may originate out of these outputs are to be seen in future phases of implementation. For instance, the uptake and use of the research generated and to be generated in the near future is the pivot around which effectiveness as well as sustainability could be seen.

- Regarding sustainability at the output level, the prospectives are positive if information continues to feed the pilot research system generated by the soon to be completed CABSA first phase and continues to be articulated with the upcoming second phase. Yet the potential for sustainability is based on the ultimate effectiveness of the project's subsequent stages.
- The first phase of the project did not fully comprise matters such as sustainable development goals, gender, disability inclusion or the Leave No One Behind agenda. Gender equality and other gender – related issues are foreseen to be interweaved in the upcoming second phase.

An unplanned yet positive result of CABSA Phase I is the beginning of the generation of a spontaneous South – South collaboration network dealing with air pollution in Asia Pacific countries including the targeted countries (covering Cambodia, Lao PDR and Thailand for Phase I and supporting Indonesia, Mongolia and Vietnam in Phase II) but also go beyond the targeted countries. The first phase of the project (being a research pilot) lacked a vision that went beyond air pollution research. That is, although basic analysis and data gathering (including modelling) was highly positive to analyse sources of contamination and other technical aspects, the project per se still is short a vision of how this analysis can be translated into actionable mechanisms that not only include air pollution strictly as a subject but also embraces issues such as policy, transparency, sustainable development, social aspects of air pollution and air contamination, economic tools to confront this problem in the Asia Pacific region.

Based on the above conclusions, a set of recommendations are presented in the following sections to apply for the second phase of CABSA, but also to expand in scope and include broader aims for a potential third phase of implementation. The recommendations are for a future endeavour to be carried out with the right adjustments for planning and for ensuing implementation, with a programmatic and results oriented approach and with a broader resource base and partnerships. The broadening of the projects is not only intended and recommended by this evaluation to include more countries, but to encompass a broader scope programmatically and conceptually.

The proposed recommendations are considered practical, actionable and feasible and directed to the intended users of the report about what actions to take or decisions to make to further work in this area. They are divided into two sections: recommendations for Phase II of the CABSA project and for further programming, being it CABSA Phase III and/or further programming in general. The recommendations are for UNDP / BRH in their totality.

For Phase II the recommendations: (a) project should commence to work on effectiveness, for instance, support research and analysis while "translating" data into policy

tools and connecting research to institutional and social policies for uptake of knowledge generated in Phase I and knowledge that commences to be generated in Phase II; (b) work planning should be carried out in a manner that socio – economic and policy analysis is not left for latter stages of implementation; (c) regarding gender, include exploring gender analysis and impacts of air pollution from a gender perspective (to ensure targeted interventions address adverse impacts on different gender groups); (d) incorporate capacity building initiatives (individual and institutional capacity) from the beginning of implementation, using the knowledge harnessed and the knowledge management products from Phase I; (e) strengthen South-South Cooperation horizontally among the partner countries involved in Phase II and draw-in those involved in Phase I in these types of exchanges, discussing how to maintain and further develop the framework of partnership among participating countries.

For a potential third phase and for further programming, the recommendations are summarised as follows with the understanding that the Phase II period of implementation should be used to catalyse further phases of this initiative: (a) planning of future interventions should attend to specific mechanisms to be effective such as design future components with a results-based approach so that programmatic and management mechanisms are inserted in project planning (risk management as well as monitoring and reporting plans) to conduct towards efficient and effective implementation that gages results as an effect of the project; (b) further programming should centre also upon increasing the scope of the project the intervention a proactive developmental project that accelerates structural transformations in an integrated and multivariate manner to deal with air pollution issues in the Asia Pacific Region including in the design and implementation of products tools and mechanisms that produce uptake and bridge the gap between research / technical information and policy and institutional strengthening; (c) articulate with cross cutting issues (such as gender, equity, developmental factors, and rights approaches and the relation with the private sector that a project increase in scope should have); (d) design and implement improved communication channels, not only from project to countries and partners (always informing what is being achieved and implemented) but also horizontal communication among the partner countries involved; (e) generate linkages (related to funding but also related as importantly to coherence) and finding partnerships with other key players, institutions and agendas in the field that deal with air pollution at different levels; (f) promote South – South and Triangular cooperation among and between participating countries, not only to inform but to strengthen regional horizontal cooperation.

V. INTRODUCTION TO THE EVALUATION

This assessment's purposes, objectives and scopes are different than for standard UNDP evaluations. The scope is three-fold. The first part has similarities with a standard final evaluation, given that the scope is to assess achievement of end of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from the project, and aid in the overall enhancement of UNDP programming (i.e. for Phase I). The second part of the evaluation assesses the design and initial implementation of Phase II (which has recently begun). Lastly, it is expected that findings and recommendations from the evaluation of CABSA I and II will inform the design of a potential CABSA III. For CABSA Phase I, the assessment process has as one of its purposes to promote accountability and transparency and assesses the extent of project accomplishments. For CABSA Phase II of this project, the purpose is to have the evaluation findings and recommendations help guide course corrections and adaptive management in the early year of implementation. And (as seen above), for the potential third phase the purpose is to provide recommendations for this next project.

The primary audience or users of the evaluation are UNDP (in particular UNDP's Regional Hub in Bangkok) and donor or potential donors. The evaluation audience (mainly the Commissioning Unit) intends to learn from this evaluation the strengths, challenges and achievements of the CABSA project to generate new interventions that are integrated and proactive in the developmental field, especially regarding air pollution in the Asia Pacific region.

The structure and contents of the report are coherent with the evaluation scope, purpose and intended use. That is the contents analyse achievements and challenges along evaluation criteria (relevance/coherence, effectiveness, efficiency and sustainability) and examines cross cutting issues to generate conclusions, lessons learned as well as recommendations.

The time scope of the evaluation runs from the beginning of the project (including project design stage) to the time when this evaluation initiates. An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework, which provides performance and impact indicators for project implementation along with their corresponding means of verification.

VI. DESCRIPTION OF THE INTERVENTION

As planning documents for this project indicate (in recent years) in the face of urban growth, economic expansion, growing energy demands, agricultural production, industrial production, tourism, transportation and general consumption air pollution has become a leading threat to the health of the environment and population in Asia. These matters translate to onward social and economic costs that undermine the gains of economic and development advancements. The impact of air pollution is getting more serious and leads to dangerous health impact in Asia. According to the World Health Organization (WHO), Southeast Asia recorded the highest urban ambient air pollution levels in the world in 2016. An estimated 2.4 million premature deaths were attributed to air pollution. Different air quality reports indicate that nearly all Asian urban areas exceed WHO's annual exposure guidelines. Although attention is significantly placed on urban industrial sources, other sources of air pollution are also significant in Asia (such as vehicle emissions, combustion of low-quality fuels, agricultural burning and forest fires). The difficulty to deal with these problems throughout the continent is compounded by the fact that dealing with air pollution is not only a technological matter. Policy, governance, economic, normative and social factors also influence potential and actual pollution control issues. Needless to say, that contamination has impacts upon health, productivity, employment and society. In addition, the global demand for greenhouse gas reduction and carbon neutrality regarding climate change is a great challenge to Asian countries with high economic growth rates and rapid increases in greenhouse gas (GHGs) emissions.

This project was developed with the understanding that air pollution control must be based upon sound scientific research and data, as well as upon monitoring and forecasting. The CABSA project in its Phase I work focused on the Lower Mekong Countries, to reinforce regional air pollution monitoring and forecasting capabilities. UNDP, through RBAP, with support from the MOE of the Government of Korea, supported the Asia-Pacific region (with Thailand, Lao PDR and Cambodia as piloting countries in Phase I) to tackle air pollution by introducing a prototype AAQMaP. CABSA Phase II, is an expansion of the first phase of this project (covering Indonesia, Mongolia and Vietnam) in collaborative efforts to tackle regional air pollution challenges. The aim is also to update the AAQMaP and its associated modelling to continue to stimulate governments' decisions on policies and investments that promote a cleaner, greener environment. The overall objective of the project is geared to accelerate structural transformations for sustainable development through multi- stakeholder partnerships within and across government and society. The specific objective is "Improved, transparent, accurate, and

efficient air quality data platform to inform government's investment decisions that promote a cleaner, greener environment."

The project has a conceptual Theory of Change (ToC), as seen in the figure below. It is based on the acknowledgment of root causes to the problems the project identifies and –in relation to these—inform and support efforts to tackle regional air pollution challenges and inform government's investment decisions that promote a cleaner, greener environment. As indicated by planning documents, the overall focus of the intervention is to drive transformation by leveraging on a consortium of expertise from a multitude of sectors that can inform on the application of the latest scientific data and knowledge. The general strategy recognises that available data science technology will leverage regional air quality data from existing air quality monitoring networks and satellite technology (coupled with ground-sensor data, machine-learning, air quality modelling and analysis capabilities) to enable regional air pollution monitoring and forecasting. ToC graphically links, as a planning tool, root causes to project inputs/activities, to outcomes, and further to activities and objectives. (See Figure 1: Theory of Change for Clean Air for Blue Sky Asia). The ToC is of quality since it theoretically indicates the links between research and policy yet are presented there in a hypothetical manner, nevertheless the feasibility of seeing change as part of a research project is not articulated fully. That is, how to achieve objectives with the products to be generated is not sufficiently specific to guide results and concrete effects arising out of the intervention.

The stakeholders participating in the project were researchers and academic counterparts (from diverse universities such as Incheon National University, Daegu University, Seoul National University of Science and Technology --all of these institutions from the Republic of Korea--, Chulalongkorn University from Thailand) as well as persons from governments from the different countries involved. Stakeholders were involved as researchers, and participants in project workshops and events.

The use of this information gathering exercise would aim to help stakeholders (from the public as well as from private sectors) to develop data-driven policies, strategies, and initiatives to understand and collaborate onto the management of regional air pollution in the Asian region.

FIGURE 1: THEORY OF CHANGE FOR CLEAN AIR FOR BLUE SKY ASIA

Root Causes	Project Inputs/Activities	Project Outputs	Project Outcomes	Project Objectives
▪ The global demand for greenhouse gas reduction and carbon neutrality in the era of climate change ▪ Non-existence of an integrated cross-border data system to provide air quality information in the region ▪ Lack of capacity at national level to tackle air pollution challenges in a systematic manner, using integrated science-based air quality modeling ▪ Low, disintegrated, sporadic and non-inclusive initiatives and investment in the areas of air pollution that do not take into account socioeconomic challenges/issues	▪ Harnessing the power of data science and the use of new technologies including satellite geospatial technology, modelling and analysis capabilities, etc. to improve transparency, accuracy, and efficiency of air quality data ▪ Leveraging air quality modeling for impact by reinforcing national counterparts' capacities to address the air pollution challenges through the development and customization of integrated science-based Air Quality Modeling ▪ Scaling innovative initiatives and ventures that are addressing air pollution management and policy	▪ A prototype Air Quality Platform ▪ Integrated cross-border data system ▪ Series of training for air quality modeling technology and data analysis ▪ Air quality analysis and modeling tools ▪ Lessons learnt analysis of Korea's National Air Quality Management Plan and air quality policies ▪ Portfolio of actions and initiatives to improve regional air pollution management and policy measures ▪ Identified scalable initiatives to address air pollution management and policy measures	▪ A prototype AAQMaP to support countries in addressing the air quality information and transparency gap by bringing together air pollution data from local and national agencies, including governments, academia and private sector ▪ Capacity building of national counterparts to address the air pollution challenges, through the development and customization of Integrated science-based air quality modeling measures ▪ Innovative initiatives and investment that address air pollution management and policy measures for sustainable	▪ Improved, transparent, accurate, and efficient air quality data platform to inform government's investment decisions that promote a cleaner, greener environment

Although the ToC, as seen above, as a planning tool, is multipart and indicates in a graphic manner not only project outputs, outcomes, activities, and root causes for the problem as linked to the objective (and to some degree indicating predicted causality graphically through arrows) the results framework is quite simplified. (See Annex 6: Results Framework for CABSA I and Annex 7: Results Framework for CABSA II).

This is the case since this project was conceived as a much larger (in scope) intervention which was reduced to the actual implementation that has taken place in Phase I and will take place in Phase II in order to adapt to limitations. These are limitations in financing and limitations in harnessing strategic alliances with other actors thus far. Both CABSA phases are implemented by UNDP using the Direct Implementation Modality (DIM). Total budget for each of the phases is presented in the table below.

TABLE 1: TOTAL BUDGET CABSA PHASE I AND CABSA PHASE II

▪ CABSA I: $ 419,181
▪ CABSA II: $ 415,150

The major difference between both phases is evidently the targeted countries: Thailand, Laos PDR, and Cambodia for Phase I; Indonesia, Mongolia, and Vietnam for Phase II. There has been addition of some gender aspects in Phase II also. The outputs expected to be achieved through several activities, for both phases, are as follows:

- Output 1: Air quality information gap is addressed in targeted countries through a prototype AAQMaP;
- Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models;
- Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up and catalysed.

The design, based on Concept Notes, contains a results framework that follows a standard UNDP template, where Expected Outputs, Output Indicators, Data Source, Data Collection Methods and Risks which are required. Outcomes and outcome indicators are not required in this case. That is, the concept notes (for Phase I and for Phase II), describe the three outputs above and include several activities to be carried out to obtain these outputs or products.

Although not part of the formal results log frame, there have been some changes from Phase I to Phase II regarding gender marking. All outputs are GEN I during CABSA I. However, Output 2 and 3 have been upgraded to GEN 2 during the design of CABSA II, incorporating gender inclusive indicators.

VII. EVALUATION OBJECTIVES

The overall objective of this evaluation, for CABSA Phase I, is to promote accountability and transparency and assesses the extent of project accomplishments. For CABSA Phase II, the objective is to have the evaluation findings and recommendations help guide course corrections and adaptive management in the early year of implementation. And, for the potential third phase, the purpose/objective is to provide recommendations for this potential next project.

The criteria the evaluation used to fulfil the above objectives and assess performance and the rationale behind them are as follows: relevance/coherence, efficiency and effectiveness (results/achievements towards objective and expected outcome), and sustainability (financial, socio-economic, institutional framework and governance). The overarching evaluation questions vis-à-vis the criteria are the following (as indicated in the evaluation matrix used to conceptually guide this evaluation, see Annex 4: Evaluation Matrix) :

- How relevant is the project regarding national policies, and UN / UNDP corporate mandates?
- To what extent have the expected outcomes and objectives of the project been achieved, or are likely to be achieved?
- To what extent resources/inputs (funds, time, human resources, etc.) have been turned into results and the results have been delivered with the least costly way possible?
- What have been the cross-cutting issues in the Project and how have been incorporated in design, implementation, monitoring, etc.?
- What are the prospects of sustainability?

These evaluations questions were accompanied by relevant sub questions. The rationale for analysing performance vis-à-vis the above-mentioned criteria is to generate findings based upon evidence and to generate lessons learned and recommendations, fulfilling objectives of the evaluation.

VIII. Evaluation Approach and Methods

The evaluation approach was participatory and consultative ensuring close engagement with key stakeholders and partners as much as possible. This assessment did use a variety of multiple information and data sources (primary, secondary, qualitative, quantitative, etc. to extract from document analysis and desk review, online/telephone interviews.

The approach entailed the collection and analysis of both qualitative and quantitative data, to validate and triangulate information so that methodologies implemented through specific tools feed into each other and are mutually supportive to validate information. The approach was participatory and consultative, not only in the data gathering aspects but also in the presentations and validation processes. For instance, in addition to consultations to stakeholders throughout the data gathering periods, the ensuing reports were put forth for comments for key stakeholders to consult in all stages of reports production.

As stated in the Terms of Reference to this assessment, the evaluation's scope is three-fold. Firstly, the evaluation assessed the achievement of project results against what was expected to be achieved. From this, the scope was to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming. The evaluation was also intended to promote accountability and transparency and assesses the extent of project accomplishments. Secondly, the evaluation analysed the design and implementation of CABSA II. The choice of having the evaluation conducted at early stage the implementation of CABSA II was intended to ensure that the evaluation findings and recommendations would help guide course corrections and adaptive management in the early year of the implementation. Lastly, the third scope aspect, it was expected that findings and recommendations from the evaluation of CABSA I and II would be used to inform the design of CABSA III.

The evaluation's scopes, therefore, are different than for standard UNDP evaluations given that the scope is three-fold. The first part has similarities with a standard final evaluation, since the scope is to assess achievement of end of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from the project, and aid in the overall enhancement of UNDP programming (i.e. for Phase I). The second part of the evaluation assesses the design and initial implementation of Phase II (which has recently begun). Lastly, it is expected that findings and recommendations from the evaluation of CABSA I and II will inform the design of a potential CABSA III. For CABSA Phase I, the assessment

process has as one of its purposes to promote accountability and transparency and assesses the extent of project accomplishments. For CABSA Phase II of this project, the purpose is to have the evaluation findings and recommendations help guide course corrections and adaptive management in the early year of implementation. And (as seen above), for the potential third phase the purpose is to provide recommendations for this next project.

The primary audience or users of the evaluation are UNDP (in particular UNDP's Regional Hub in Bangkok) and donor or potential donors. The evaluation audience (mainly the Commissioning Unit) intends to learn from this evaluation the strengths, challenges and achievements of the CABSA project to generate new interventions that are integrated and proactive in the developmental field, especially regarding air pollution in the Asia Pacific region.

The structure and contents of the report are coherent with the evaluation scope, purpose and intended use. That is the contents analyse achievements and challenges along evaluation criteria (relevance/coherence, effectiveness/efficiency and sustainability) and examines cross cutting issues to generate conclusions, lessons learned as well as recommendations.

The scope also entailed (as indicated in the guiding ToR of this assessment) assessing project performance. The timeframe scope of the evaluation covers the beginning of the project (including project design stage) to the time when the evaluation is initiated (August 2024).

The three expected outputs, which were those analysed within the prescribed scope, were as follows:

- Output 1: Air quality information gap is addressed in targeted countries (Thailand, Laos PDR, and Cambodia for Phase I and Indonesia, Mongolia and Vietnam for Phase II), through a prototype AAQMaP;
- Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models;
- Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up and catalysed.

The evaluation was conducted according to the guidance, rules, and procedures established by UNDP as reflected in the *UNDP Evaluation Guidance for Development Projects*. The triangulation methods used were associated to the diverse range of data sources and processes employed (i.e., triangulation, validation) to guarantee inclusion, accuracy and credibility. This implies that the information was collected from different sources and different typologies and cross-checked to validate.

The evaluation process used gender-responsive methodologies and tools and ensure that gender equality and women's empowerment, as well as other cross-cutting issues and SDGs, as or if they incorporated as relevant to the project. The gender-responsive evaluation assessed how (or if) gender issues are included in the project (from design/planning to implementation processes) and provided information on the way in which the Project is or will be affecting women and men differently and how women are included in the project within a rights framework. Gender related questions were included in guiding questions as well as in questionnaires. However, the most important gender related analysis is that done by this assessment when judging design comparatively (that is comparing Phase I with Phase II) and when analysing in depth whether gender differentiated issues regarding air pollution are addressed by the project in its already implemented phase as well as in the projection of future phase(s). Evidently, the raised gender marker for the second phase cannot be evaluated since the second phase has not begun to be implemented at the time of this evaluation start.

As described in the evaluation matrix in annexes and as developed in the evaluation's inception processes, the data sources (i.e. the sources of information) were mainly documents and interviews/questionnaires with key stakeholders. Given limits posed to the evaluation (resources in terms of funds and time constraints) and also given the nature of the project, there was no mission to relevant countries; that is, the evaluation was wholly home based.

The selection of stakeholders to engage with followed a functional rationale. That is, the stakeholders selected to interview were all of those who were engaged in a substantive way in the project (staff, researchers, government representatives, etc.). The whole universe of these stakeholders was invited to engage with the assessment. Therefore, there was no sampling since all stakeholders UNDP had as relevant were approached.

Ethical considerations were taken into account. These included measures taken to protect the rights and confidentiality and anonymity of response of informants, including the right of stakeholders not to engage as seen above. The processed followed guidance as presented in UNEG 'Ethical Guidelines for Evaluators'. An ethical pledge was signed by the evaluator (see Annex 1: Signed Pledge of Ethical Conduct in Evaluation).

Limitations and evaluability

As it occurs in most of these sorts of assessments, there can be a series of limitations. Besides the characteristic evaluability issues such as access to inputs, constraints in terms of resources and time there were other specific limitations identified, i.e. non methodological limitations. Documents selected to review were all relevant documents, mainly reports by and

for the interested parties. Therefore, the selection of documents was wide. Document review went well but with limitations as to the sort of documents that were available (for instance, reporting documents generated within the project were not standard UNDP monitoring documents given that-- as explained further along the report – this is a project that does not produce or generate the same type of monitoring reporting as larger more development-oriented projects). (See Annex 8: List of supporting documents reviewed)

For instance, the results framework for CABSA I and II follows a standard UNDP template, where Expected Outputs, Output Indicators, Data Source, Data Collection Methods and Risks are required, while outcome and outcome indicator are not. Attempting to apply guidelines for evaluations that ask for outcome analysis has been a limitation given that the indicator set does not reflect these aspects fully since the results framework and therefore reporting does not contain instruments to gage outcomes.

It is of interest to note that at large there was little ownership of most key stakeholders regarding the evaluation process, and this also was a challenge or a limitation. This was an evaluation carried out without a mission, and engagement with stakeholders was problematic. This could be due to the nature of the project, in the first place, given that –as will be thoroughly seen in the next sections of this report—it is an unusual project in the sense that it is greatly centred upon research and not so much as a developmental intervention. Therefore, the stakeholders were perhaps not aware of the importance that evaluations have within international projects. Furthermore, several stakeholders that were part of the sampling frame were only very partially engaged and considered that they did not have much to contribute to the evaluation. For those stakeholders who did not want to engage in an oral interview, but agreed to answer questions, online a questionnaire methodology was applied to reduce limitations and safeguard evaluability. That is, when stakeholders were not able to fully engage in the interview process or were not willing to do so, a questionnaire with similar questions was implemented. Several stakeholders did not want to engage at all, and it is understood that this is their prerogative. Interviews were problematic to program for several other reasons: interview period overlapped with meetings on air quality most stakeholders were involved in and with several holidays in relevant countries. (see Annex 5: List of stakeholders evaluation engaged with).

Overall, therefore, this evaluation is confident that notwithstanding limitations and singularities of the project, the evaluation followed due diligence in carrying out an ethical and relevant assessment processes. Although the level of involvement of stakeholders in the interview processes was not as high as desirable, together with the personal interviews and with

the questionnaires methodology the evaluation was able to engage with nearly 70 percent of the list of key stakeholders provided by the UNDP. The activities in which the stakeholders interviewed engaged in were project management, research, workshops, air quality monitoring, air emission inventory, harnessing of satellite data, air quality modelling, and policy analysis (including policy scenarios).

Therefore, the evaluation understands that with purposive sampling and efforts by the project and by the evaluator to engage with as many key stakeholders as possible through different methods there were no limitations to evaluability due to this. There is confidence that the evaluation process sustains its findings and forward-looking lessons learned as well as recommendations.

IX. DATA ANALYSIS

The procedures used to analyse the data collected to answer the evaluation questions were based on qualitative and quantitate analysis. Quantitative analysis was carried by using the logical framework and related indicators as benchmarks to tally project progress in implementation, as relevant. Qualitative examination was mainly applied to the information harnessed by using thematic analysis of interviews and of questionnaires responses. All of these analytical tools were triangulated and validated internally and through validation via stakeholders' reviews of findings. The use of both qualitative and quantitative data supported the validation and triangulation of information. Through a combination of methods feedback between the various tools and validation between different levels and types of data collection was sought to triangulate the information, and thus ensuring the validity of the data that give rise to the evaluation process and to this report.

The data collection and analysis strategy were broad and inclusive. The rationale for the selection of each method was due to standard practice in these sorts of assessments (as indicated in UNDP guidance) and to foster triangulation/validation. There was no sampling strategy given that all documents produced under the project were analysed and all stakeholders of the project (as indicated by UNDP) were approached. Therefore, the strategy does not address representation given that it has gone beyond this issue by including the universe of project participants as indicated by UNDP and all of the documents produced by the project.

Furthermore, the participative approach and engagement with project staff used also aided in validating and triangulating data analysis. For instance, all interim and final deliverables (reports, presentations) were vetted by commissioning unit. Their input and participation further aided in validation.

X. FINDINGS

Relevance/Coherence

Overall, the project is relevant regarding national policies as well as regarding UN / UNDP corporate mandates. It is formally aligned to corporate global and regional mandates as well as to several individual countries' policies.

The objectives of this intervention are consistent with the needs and interest of the people in the targeted region(s), the needs of the different countries involved as well as national strategies, and relevant national legislation and policies. This is exemplified by some of the conclusions presented in planning documents and beyond. A key example related to concrete relevance is the fact that according to the World Health Organization (WHO), Southeast Asia has the highest urban air pollution levels in the world and an estimated 2.4 million premature deaths were attributed to air pollution. The Air Quality Report (2018) from Greenpeace and AirVisual found that 95 percent of Southeast Asian cities surveyed exceeded the WHO's annual exposure guidelines.

Furthermore, at the national level for instance, planning documents indicate that the Lower Mekong region has faced major landscape challenges caused by deforestation, human-induced burning of agricultural areas, and forest fires, which is also an important aspect for climate change response in the region. In Phase II countries it is also clear that what the project seeks to obtain is relevant at the policy levels as well as regarding the materiality of air pollution and its impact upon developmental factors and national policy relevance. For example, it is indicated that in Indonesia there are 37 cities with at least one automated air quality monitoring system (AQMS). In Mongolia, there is a National Action and Planning on short-lived climate pollutants (SLCPs) mitigation initiative based on an assessment, "Opportunities from taking integrated actions on air pollution and climate change. This signals that the countries consider the subjects to be dealt with within the project as relevant and attuned to its national strategies and current national policies. [2]

Relevance vis-à-vis corporate UNDP and UN mandates is as follows:

- Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework: Outcome 1: Inclusive and sustainable structural

[2] As indicated in Concept Notes (for Phase I and for Phase II).

transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions;

- Outcome indicators as stated in the Regional Programme Results and Resources Framework: 1.3. Number of Asia-Pacific cities in most polluted 100 cities in the world;
- Applicable Outcome(s) from the UNDP Strategic Plan: SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions.

And for CABSA II as follows:

- Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework: Outcome 1: Inclusive and sustainable structural transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions;
- Outcome indicators as stated in the Regional Programme Results and Resources Framework: 1.3. Number of Asia-Pacific cities in most polluted 100 cities in the world;
- Links to Regional Programme Outputs (2022-2025): RPD Output 1.4: Sustainable, scalable and innovative solutions and strategies for Nature, Climate and Energy transformation strengthened through enhanced Climate Promise, nature-based solutions, and transitioning to clean energy and zero-carbon development;
- RPD indicator 1.4.4 Number of countries participating in transboundary and regional strategic cooperation for sustainable natural resources management Baseline (2022): 3 Target (2026): 6;
- Applicable Outcome(s) from the UNDP Strategic Plan: SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions.

It should be noted that relevance is specifically also connected to activities in CABSA I and II. For instance, within Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models, there is an activity (i.e. Activity 2.2) that aims to “Identify and assess relevant national public

policies/programs/scenarios aiming to address regional air pollution. This is indicative that relevance was also sought within planning.

Lastly, the stakeholders with whom this evaluation engaged with indicate the high relevance of this intervention, of current and of future stages. For instance, it was specifically indicated that the data generated or gathered by the initial phases of this project are relevant regarding the type of policies the countries involved need to develop to tackle air pollution issues. For example, to know emissions' origins to develop policies to deal with them.

Relevance is also captured through the regional and country level specific demands to deal with air pollution in Asia Pacific countries in an integral manner. Demands (explicit and implicit) are expressed as the need for: identification of critical polluting sectors and emissions; policies and other factors causing problems; understanding gaps and interconnectedness between and among economic, energy, environment and health models; designing appropriate prototype platforms to generated integrated interventions; as well as supporting and enhancing capacity to integrate and synergize policy interventions.

Coherence is the compatibility of the intervention with other interventions in a country, sector or institution. Although conceptually coherent/consistent with international and national policies or at least aspirational expressions of policies in the countries involved regarding air pollution control (as seen in the conceptually related criteria of relevance above), there has been no concrete external coherence in CABSA Phase I. That is, there has been no coherent link of the intervention with other actors' interventions in the same context (that is no complementarity, synergies, nor harmonisation and co-ordination with other interventions). The project has had so far very little concrete partnerships and no major synergies with other interventions in similar fields, particularly lacking is cohesiveness with other international agencies working directly or indirectly in the subjects CABSA deals with. Although strategic association with other interventions, and other UN agencies, was expressed as desirable in the planning documents (concept note), these have thus far not materialized fully.

Nevertheless, this evaluation has captured that as an outcome (perhaps an unplanned but desirable outcome evidently) the project has commenced to forge horizontal relationships between and among the Asia Pacific countries involved thus far and to be involved in the next phase(s). This is a key finding given that regional cooperation and South – South and Triangular cooperation can be formally enhanced in the future not only for the relevance/coherence of the intervention but also for effectiveness and efficiency.

Efficiency and Effectiveness

Efficiency is the extent to which an intervention delivers, or is likely to deliver, results in an economic and timely way. Economic being the conversion of inputs (funds, expertise, natural resources, time, etc.) into outputs, outcomes and impacts in the most cost-effective way possible, as compared to feasible alternatives in the context. Timely is defined as the delivery within the intended timeframe, or a timeframe reasonably adjusted to the demands of the evolving context. This may include assessing operational efficiency (how well the intervention was managed) for example.[3]

The analysis of efficiency (as will be the analysis on effectiveness below) will zero in on CABSA Phase I with target countries being Thailand, Laos PDR, and Cambodia given that Phase II (with targeted countries being Indonesia, Mongolia and Vietnam) has not begun to operate fully as yet. Some analysis, however, is relevant to both phases, for example implementation strategy examination, etc., although it is too early to link efficiency to outputs in Phase II. The inputs and resources (funds, time and human resources) have turned into outputs, fairly much as planned. In this case they are products delivered within costing plans. While very much donor driven, both CABSA phases are implemented by UNDP Bangkok Regional Hub using the Direct Implementation Modality (DIM). Resource limits have implied limitations in human resources for implementation. The project is being executed through the UNDP Bangkok Hub by one person with a part time one third time dedication (given that staff oversees the three projects under the Republic of Korea's cooperation portfolio within the Regional Asia Pacific UNDP Office). The project management "light" structure therefore has been efficient in guiding and implementing expected outputs with value for money, with an implementation strategy and execution that is efficient and cost effective considering the streamlined manner in which execution has taken place. In light of management and delivery and considering limitations imposed by several aspects (such as funding), the outputs were delivered in a positive manner.

This is not only due to management efficiency through UNDP's Regional Hub in Bangkok, but also due to the involvement of the contracted party, i.e. the Incheon National University of the Republic of Korea (INU) who has developed the outputs in a timely manner with high quality research. Regrettably, however, there were no synergic processes captured with other UNDP

[3] OECD (2023), *Glossary of Key Terms in Evaluation and Results-Based Management for Sustainable Development (Second Edition),* OECD Publishing, Paris, https://doi.org/10.1787/632da462-en-fr-es.

initiatives/projects that would contribute to reducing costs while supporting results, although several were planned at inception of this project, nor were there synergies with other projects from other agencies. Although planning documents indicate that "knowledge, good practices and lessons will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project", there is no evidence that this has fully occurred. Also, regarding other projects and programmes, stakeholders have indicated that even conceptually, as well as programmatically, CABSA is not linking to other related issues, such as Climate Change agenda in the region. In short, the project is acting and is perceived to be acting in isolation and not in an integrated manner.

As seen in the introductory section, there were three outputs expected to be achieved through a number of activities, for both phases. It can be safely stated that the project has efficiently harnessed data and developed research. For example, through the comprehensive collection of air quality monitoring data from each country involved in the first phase, providing a detailed overview of pollutant levels in various regions. This data allows for the identification and pinpointing of main sources of air contamination and trends. Data also allows the development of air pollution emission reduction scenarios for partner countries and quantitatively analyses the reduction effects, providing scientific evidence needed to establish effective air quality improvement strategies. Besides data gathered and analysis on air quality monitoring, air emission inventories, and analysis of satellite data, and policy intervention scenario/policy analysis, the project engaged in workshops and generated the AAQMaP system. In annexes (Annex 9: Overall Implementation Progress and Summarised Findings of the Project) there is a narrative on project achievements and summarised research findings.

Several aspects still remain to be finalized at the time of this evaluation or to be reported as such. These include the assessment of financing requirements and cost-effective measures for implementing policy options and interventions and the determine the status of international financial support, evaluate the efficacy of international funds utilization for air quality projects, and assess the transparency and efficiency of fund utilization, as well as to generate a portfolio of actions and initiatives with scalable programmes to address air pollution management and policy measures while do stakeholder mapping and KM aspects. It is evident by the research already carried out in relation to what remains to be carried out or what has been left to be analysed in the last months of Phase I that the project has prioritised the technical research while waiting for the socio – economic and policy analysis for the latter stages of implementation. Work planning therefore prioritized the first output and concentrated upon it.

Contributing factors to efficient implementation have been various. And adapted to different on the ground circumstances that the project found during implementation. The main contributing factors to efficiency were:

- Light but efficient management structure by UNDP's Regional Hub.
- High quality research by contracting party.
- Ownership of main key stakeholders of the research process.
- Relevance of the research vis-à-vis materiality of the issue and of the concerns regarding air pollution in Asia Pacific.

The main hindering factors, overarching to the whole project were:

- Limited resource base (i.e. funding, and therefore staffing, contracting, etc.), given that funds were very partial, which also hindered the development of many intended processes (socio economic content).
- Lack of complete knowledge of local issues in targeted countries (such as data and/or data access, policy, etc) by contracting party to be able to more efficiently develop products.

The hindering factors translated into challenges. Some were surpassed by adaptive management, and some were transcended by application of different strategies by UNDP and by contracted parties. Nevertheless, some challenges still remain. It is from these challenges that there is a learning process on which recommendations for Phase II and for upscaling the intervention is made in this report. The main challenges identified by this evaluation are as follows:

- Project was not designed with the tools of a robust development programme since it is essentially a concept project to generate and upscale interventions. Therefore, many of tools for monitoring and reporting such as project implementation reports, analysis of indicators vis a vis achievement, etc., are not present in project design, making efficiency and effectiveness, as well other analysis, difficult at this point.
- Data collection was more challenging than anticipated, quality/quantity of data in target countries was more scarce or inaccessible than anticipated by researchers.
- Lack of quality air monitoring networks and emission baseline data in many cities/areas and in targeted countries and throughout the Asia Pacific region.
- Had to surpass limitations of deficient ground-based air quality monitoring data through the use of air quality modelling and environmental satellite data, a more

comprehensive approach and addressing information gaps, yet this remained a challenge.

- Communication between and among researchers at times difficult (due to cultural differences, language barriers).
- For some countries proper channels were not used to work with them. That is, no formal letters of invitation or agreement were sent to countries to operate/collaborate within the project, just informal invitations for researchers to take part, deterring official access to data and hindering national ownership.

Effectiveness and efficiency are related criteria. Yet, effectiveness looks not only at what was achieved but what results (i.e. "effect") the intervention may have had. Regarding effectiveness, evaluations need to consider the extent to which project *outcome* achievements were commensurate with the ex-ante targets. Below is a table with progress towards outputs generated by UNDP to indicate not only progress but also how effective the project has been in achieving at the output level (remembering that outcome level achievements were not a part of results framework since it was not mandated in this case).

UNDP reports progress towards outputs in the following table. As seen in the charts, most expected outputs have been achieved to the expected levels by the time that this evaluation took place. Breakdown by each expected output is highlighted in the next paragraphs:

- Output 1: Air quality information gap is addressed in targeted countries (Thailand, Laos PDR, Cambodia), through a prototype AAQMaP
- All data from monitoring stations collected and managed by each country
- Comprehensive assessment completed for Cambodia, Laos and Thailand
- AAQMaP prototype server built
- Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models
- Six scenarios developed based on modelling analysis
- Participants from Thailand, Indonesia, Vietnam, Mongolia, Cambodia and Lao PDR have participated in training courses.
- Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up and catalysed
- In progress

TABLE 2: PROGRESS TOWARDS OUTPUTS (AS REPORTED BY UNDP)

Expected Outputs	Output Indicators	Data Source	Baseline		Targets			Data Collection Methods and Risks
			Value	Year	2022	2023	2024	
Output 1: Air quality information gap is addressed in targeted countries (Thailand, Laos PDR, Cambodia), through a prototype AAQMaP	1.1 % of data sets collected from various observations and sources needed to AAQMaPs	Data generation to harmonize modeling input	0	2021	60%	80%	90%	Surveys Monitoring
	Progress to date: All data from monitoring stations collected & managed by each country					100%		
	1.2 A comprehensive assessment completed to identify air quality information gap in targeted countries	Project Monitoring Reports	NO	2021	YES	YES	YES	Project Monitoring Reports
	Progress to date: Comprehensive assessment completed for Cambodia, Laos and Thailand					YES		
	1.3 % increase in monthly users/visitors of a prototype Air Quality Platform (Baseline #. of users at the launch of the AAQMaP, assuming Q3 2023)	System generated data	0%	Q3-2022	20%	40%	60%	System generated data
	Progress to date: AAQMaP prototype server built					50%		
	2.1 # of generating scenarios and analysis for air quality modeling by country technology & data analysis	System generated scenario and reports	0	2022	0	15	30	System generated scenario and reports
Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models	Progress to date: 6 scenarios developed based on modeling analysis					6		
	2.2 # of people participated in training courses on air quality modeling technology and data analysis disaggregated by gender	Project Monitoring Reports	0	2022	0	M20	M40	Monitoring Reporting
	Progress to date: Participants from Thailand, Indonesia, Vietnam, Mongolia, Cambodia and Lao PDR					F10	F20	

	have participated in training courses.							
	3.1 #. of identified scalable initiatives to address air pollution management and policy measures					M20; F10	M40; F20	
Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up & catalysed	3.1 # of identified scalable initiatives to address air pollution management and policy measures	Project Monitoring Reports	0	2022	0	1	3	Assessment
	Progress to date: In progress	Independent Evaluation						Feedback from partners and beneficiaries

Contracting party (i.e. Incheon National University) reports the following achievements. These are expressed as products or activities achieved. In annexes (i.e. Annex 9: Overall Implementation Progress and Summarised Findings of the Project) there is also a listing of summarised findings of the project's research.

- Workshops:
  - AAQMaP session at "the 2022 Environmental Industry & Carbon Neutrality Conference" - Songdo, South Korea (September 30, 2022)
  - Inception workshop - Online (December 9, 2022)
  - Bangkok workshop - Bangkok, Thailand (January 31.-February 1, 2023)
  - 2023 CABSA Mid-term review meeting (July 4, 2023)
  - Bangkok workshop - Bangkok, Thailand (January 11-12, 2024)
  - Scenario workshop - Online (June 20, 2024)
- Air quality monitoring:
- Collecting air quality monitoring data through local partners
- Thailand partners: Chulalongkorn University, Bangkok Metropolitan Administration (BMA), Pollution Control Department (PCD); Target Substances: CO, SO2, NOx, O3, PM10, PM2.5
- Cambodia Partner: Ministry of Environment: Target Substance: PM10, PM2.5
- Lao PDR Partner: Ministry of Natural resources and Environment: Target Substance: PM2.5
- Literature survey and data review
- Air emission inventory
  - Collect air quality inventory data through local partners
  - Literature survey and data review
  - Analyse Emissions Database for Global Atmospheric Research (EDGAR) data
- Satellite data
  - Analyse the Satellite Data User Interface
  - Potential limitations of satellite data for air quality monitoring
  - Review potential limitations of satellite data for air quality monitoring
  - Analyse air quality using NASA's Landsat-8 data for GEMS analysis
  - Collect and analyse GEMS data
  - Use of GEMS Data for Air Quality Analysis in Thailand, Cambodia, and Lao PDR
  - Use GEMS data to conduct a comprehensive air quality analysis in the regions of Thailand, Cambodia, and Lao PDR. This analysis shall include assessment of

pollutant levels, and evaluation of spatial and temporal variations in air quality parameters

- Air Quality Modelling
  - Source air emission source data
  - Setting Up a Modelling Area Grid
  - Air emission inventory is used to generate modelling input emissions through species classification, temporal distribution, and spatial distribution
  - Conducted air quality modelling using WRF-SMOKE-CMAQ for Thailand, Cambodia, and Laos from December 2020 to January 2022.
  - PM2.5 modelling by country by mitigation scenario
- Policy intervention scenario
  - Analysing national air quality policies
  - Derive air quality mitigation scenarios
  - Scenario emission estimation and analysis using LEAP
- Policy analysis
  - Analysing South Korea's Air Management Policy
  - Analyse successful policy advocacy cases.

Budget/grant for CABSA I was USD $ 419,181. This indicates an overall financial execution rate of 70 percent at the time of this evaluation report. Expectations are that all funds will be used upon closing as budgeted without major variations between plan and actual expenditures. In the following tables the budget plan and financial resources used are shown. The source for budget plan and budget note description is the project's concept note. Source for financial resource use is as reported by UNDP.

TABLE 3: CABSA PHASE I BUDGET

	Total Budget	Year 1 2022	Year 2 2023	Year 3 2024
Total project without GMS	383,980.95	151,102.19	116,439.38	116,439.38
GMS fee (8%)	31,050.50	12,420.20	9,315.15	9,315.15
Total project with GMS fee	415,031.45	163,522.39	125,754.53	125,754.53
Coordination Levy 1%	4,150.31	4,150.31		
Total Project	**419,181.76**	**167,672.70**	**125,754.53**	**125,754.53**

TABLE 4: BUDGET NOTE DESCRIPTION FOR CABSA PHASE I

#	Budget Note Description	Amount (USD)
1	Consultancy services to undertake activities under Output 1: A prototype AAQMaP to support Thailand, Laos PDR, and Cambodia	119,700.00
2	Consultancy services to undertake activities under Output 2: National counterparts' capacity developed to address the air pollution challenge	114,300.00
3	Consultancy services to undertake activities under Output 3: Catalysed and scaled-up innovative initiatives and investment	66,000.00
4	Regional project coordinator (cost sharing)	43,000.00
5	Workshop and consultation costs associated with project activities. Assume several consultations.	12,000.00
6	Travel costs for regional project staff for oversight and project implementation support visits	8,500.00
7	Support to project administrative services including procurement, HR, IT, finance services	8,480.95
8	International Consultant - Independent Terminal Evaluation (TE) included in UNDP evaluation plan	12,000.00

TABLE 5: FINANCIAL RESOURCES USE FOR CABSA PHASE I

Year	Project ID 132938
2022	32,462
2023	177,362
2024 (as of 4 November 2024)	87,742
Total	297,566 USD

However, for this project (in its current phases) it is indeed problematic to assess what effect the project has had. Effectiveness is gaged analysing what key results and changes have occurred as a consequence of a project, that is what outcomes have come about because a project was implemented.[4] Regarding outcomes in this project, therefore, it is unfeasible to gage effectiveness in those terms since it was an intervention that sought to generate the tools and information for a factual upscaled development project in the future. As it regards to outcomes, also, there are no indicators per se to measure change or effects since it was designed (and

[4] UNDP Evaluation Guidelines © IEO UNDP June 2021.

therefore implemented) to provide outputs and not outcomes. Namely, project was not designed with the tools of a robust development project since it is essentially a concept project to generate and upscale the intervention. Therefore, many of tools for monitoring effectiveness (in large part due to this) are output indicators and not outcome indicators. Evaluations are mandated to gage effectiveness such as key results defined as changes with outcome indicators.

Nevertheless, as indicated in the section on efficiency before, there have been a number of achievements at the output level. These can be construed as keystone products that highlight the *potentiality* of effectiveness. That is, with the right structuring of follow up to the phase already implemented and the phase of CABSA in implementation, the potential for effect and results is quite high.

The project as a data gathering and research exercise thus far and baseline analysis has effectiveness potential (effectiveness understood to be results based change as development projects tend to be). As analysed by this evaluation, and as indicated by a number of stakeholders, the potential effect that this project can have been quite high. Following are a series of points which underline the potential effectiveness based on outputs thus far, outputs to be generated in the next phase, as well as if a broader in scope project is designed and implemented:

- Without data and research that includes air quality modelling as well as knowing emissions' origins, countries cannot develop/implement adequate policies to deal with air pollution.
- Potentiality of effectiveness is also high not only from the intended purpose of countries learning from Korean models of air pollution control, but --also importantly-- from exchanging information and learning horizontally between and among developing countries (South – South and Triangular Cooperation), given that this has been a mostly unplanned but positive consequence thus far.
- The potential benefits (i.e. positive results) of the project are also for long-term process. Potential health benefits of controlling air pollution[5] are for instance concrete results that may appear in the long term based on the analysis already carried out and in scaling up of the intervention to seek concrete results.

[5] When stakeholders of this project were interviewed regarding incorporating issues beyond research, such as SDGs, into the phase that they worked with, they interpreted that tacitly that these matters are incorporated given the potential benefits to health that the management of air pollution can carry. This signals that stakeholders are also aware of potential benefits.

- An overarching aspect that can underline effectiveness (in Phase II and of course in a potential future project or projects based on what has been achieved in Phase I) is an issue or a question around which pivots much of potential effects. And this is how to "translate" research and technical aspects of the project into policy tools that are implementable and implemented. That is, how can technical aspects/research support policy as well as mitigations measures. And this is related on how to decode the information gathered in order for policy makers and policy implementers to uptake this and to use.

Monitoring and Evaluation

The project's concept notes (i.e. project's design instrument) included a monitoring and evaluation plan. This was drawn in accordance with UNDP's programming policies and procedures yet adapted to the characteristics of the CABSA initiatives. The monitoring and evaluation plan in design is indicated as follows.

TABLE 6: MONITORING AND EVALUATION PLAN

Monitoring Activity	Purpose	Frequency	Expected Action
Track results progress	Progress data against the results indicators in the RRF will be collected and analyzed to assess the progress of the project in achieving the agreed outputs.	Quarterly	Slower than expected progress will be addressed by project management.
Monitor and Manage Risk	Identify specific risks that may threaten achievement of intended results. Identify and monitor risk management actions using a risk log. This includes monitoring measures and plans that may have been required as per UNDP's Social and Environmental Standards. Audits will be conducted in accordance with UNDP's audit policy to manage financial risk.	Quarterly	Risks are identified by project management and actions are taken to manage risk. The risk log is actively maintained to keep track of identified risks and actions taken.
Learn	Knowledge, good practices and lessons will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project.	Annually	Relevant lessons are captured by the project team and used to inform management decisions.
Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project	Annually	Areas of strength and weakness will be reviewed by project management and

	strengths and weaknesses and to inform management decision making to improve the project.		used to inform decisions to improve project performance.
Review and Make Course Corrections	Internal review of data and evidence from all monitoring actions to inform decision making.	Annually	Performance data, risks, lessons and quality will be discussed by the project board and used to make course corrections.
Project Report	A progress report will be presented to the Project Board and key stakeholders, consisting of progress data showing the results achieved against pre-defined annual targets at the output level, the annual project quality rating summary, an updated risk long with mitigation measures, and any evaluation or review reports prepared over the period.	Annually, and at the end of the project (final report)	
Project Review	The project's governance mechanism (i.e. project advisory group) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the Advisory Group shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences.	Annually or as deem necessary	Any quality concerns or slower than expected progress should be discussed by the project board and management actions agreed to address the issues identified.
Independent Terminal Evaluation (TE) included in UNDP evaluation plan		At least three months before operational closure.	

Monitoring and reporting were implemented within guidelines in format. Reporting by the contracting party took place through the development and submission of an inception report, quarterly progress reports, annual reports, and bi-annual report. UNDP generated Combined Delivery Report by Project annually. This assessment report is the product of the evaluation plan's only activity. The other activities are monitoring related.

The reporting by the contracting party was done in a timely manner. Yet, according to stakeholders' input and this own evaluation analysis, it followed more of a research reporting format than a project reporting format. That is, the reporting (in content) was of findings of the research carried out than of actual products, processes, etc. For this evaluation, the contracting party was requested to produce a listing of activities carried out and a summarized report of the actual research findings which is found in annexes divided by the three target countries (see Annex 9: Overall Implementation Progress and Summarised Findings of the Project).

Risk management

The design phase (i.e. as articulated in Concept Notes for both phases) included SESP analysis and risk management issues. The risk identified is deemed Low and indicated as follows: *Overall, this project has low risk of adverse environmental and social impact. Main considerations are the involvement of vulnerable populations, marginalized groups and women*. This is the case for both Phases. Phase I, which is the only one being implemented, contained no mitigation strategies adopted and therefore no risk management was implemented.

Cross-cutting issues

The Concept Notes around which both phases of the CABSA project are planned around do mention some cross – cutting issues. For instance, regarding SDGs, for both phases it is indicated that the project should contribute to the *Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework: Outcome 1: Inclusive and sustainable structural transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions.* Development as a cross – cutting matter is further raised when project strategy and developmental challenges are mentioned by indicating that drivers of air pollution in the Asian region have come to be a leading threat to health and that this undermines economic gains attained. Human rights approaches are not discussed per se in the planning documents.

Although the concept notes' SESPs do mention several cross-cutting issues even indicating potential positive effects regarding gender equality and women's empowerment due to, as the SESP conceives it, enabling the improvement of local government to have improved air quality data, gender disaggregated data to inform future decision making and investments, this causality does not seem to be properly developed. That is, the link between improving gender aspects and access to information is at points implausible in and of itself and not duly articulated. The SESP includes matters such as the development of studies on the links between women – health – air pollution. Yet, here also, this remains as enunciations and not as concrete linked

products – outcome. Further, the same SESPs include assertions as to the engagement of diverse stakeholders attending to the Leave No One Behind (LNOB) outlook.

In summary, although gender considerations, LNOB outlooks, SDGs, rights framework are enunciated they are not articulated within the results log frame. This therefore diminishes the potential of implementing outputs just by expressing these this viewpoint and diminishes the probabilities that these matters will be truly attended to, as will be seen in further paragraphs.

A strong case that supports the above are gender specific considerations for both stages of implementation. Gender considerations are specifically indicated, more so in Phase II than in Phase I of the CABSA project. The three indicative expected outputs in the first phase were classified as Phase I. That is, at design, the gender marker for CABSA I was determined to be GEN1. When projects are classified as GEN1 it is because they are expected to contribute (albeit in a limited way to gender equality). Furthermore, for the projects classified in this way, gender equality is not consistently mainstreamed, and this has not been a critical consideration in project design. Nevertheless, some aspect(s) of the output at the project level (i.e. one or more of its activities) are expected to promote gender equality, yet not in a consistent manner but not in a constant and specific way.

For CABSA II its gender determination was upgraded to Gender Marker 2 (i.e. GEN2) which is defined as "Advancing gender equality is a significant objective but not the principal reason to undertake this project".

More concretely, consequently, there is an improved articulation of this gender marker with specific indicators for the second phase of implementation. The only indicator in Phase I that is included regarding gender is related to data disaggregated by gender. That is in Output 2 it is stated that: *National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models* in sub output 2.2: *Number of people participated in training courses on air quality modelling technology and data analysis disaggregated by gender*. The only specific expected gage for gender equality in this phase was simply participation of women in training courses, not a fully developed gender equality instrument. Yet, this is not even indicated in a Specific measurement (following SMART indicator analysis) given that no particular explicit number is attached to this indicator in the log frame. Nevertheless, for Phase II, and in part related to the upgraded gender marker, there are improvements not only in the enunciations of what gender aspects need to be addressed but also in the specificity of indicators. For instance, indicator above (sub output 2.2) is now specific since it states: Number of people participated in training courses on air quality modelling technology and data analysis disaggregated by gender *(50% are women*). A new gender specific

sub output is added also that indicates: 2.3 Number of scenarios are considered to address gender challenges in air quality modelling (all of the above within output 2).

Then for expected Output 3: "*Existing gender-responsive initiatives to address air pollution management and policy measures are scaled-up and catalysed"* in sub output 3.1 states: *Number of identified gender responsive scalable initiatives to address air pollution management and policy measures;* and sub output 3.2 stating: *Extent to use of results as an advocacy tool to promote gender equality/women's participation in air pollution reduction policies/recommendation* (log frames are found in Annex 6: Results Framework for CABSA I and in Annex 7: Results Framework for CABSA II). This is a significant improvement in gender specific issues from Phase 1 to Phase 2, which -- should – improve gender aspects in the upcoming second phase of this project.

The lack of a gender perspective is also accompanied by major stakeholders' perception of this matter as harnessed from dialogues with key partners through this evaluation. None of the partners interviewed had a gender outlook of implementation. There is little or no understanding from key stakeholders about gender matters. And since many consider this to be an air quality research endeavour, they are not versant on gender issues (beyond perhaps participation of women as researchers).

Albeit globally and in the region specifically it is well known that the impacts of air pollution can affect women and men differently. Increasingly, women are shown to be more vulnerable than men to the impacts of air pollution, representing the majority of the world's poor and being proportionally more dependent on threatened natural resources. Although it is well documented that women are exposed to different types of air pollution due to their different roles (productive and reproductive, not only home based), there is little acknowledgement by several key stakeholders that this is pertinent in relation to this project.

Other matters such as SDGs and developmental issues are also lacking to a great degree in the perception by key stakeholders. For example, it is indicated by persons with whom this evaluation engaged with that a developmental issue is that health is a key factor related to pollution control. Still all stakeholders put this in potentiality (that is indicating that controlling pollution would have positive health outcomes), yet do not address it cohesively not searching for specific links or research, just indicated this as a potentiality. Per requirements in the ToR, the evaluation reviewed the project planning and implementation to examine whether persons with disabilities were consulted and meaningfully involved. Unfortunately, disability inclusion issues were included in project analysis, design, etc.

Sustainability

Sustainability of the project's outputs was not fully considered in project design. This, again, could be because the first phase of this intervention is considered a pilot intervention to harness information and generate research for subsequent potential phases. The only reference to sustainability in design is related to financial sustainability when it is mentioned that "The project will collaborate with existing platforms such as the Global Environment Monitoring System for Asia (GEMS Asia), explore private sector engagement to ensure financial sustainability of the initiative in the long term". The project in neither of its phases has considered developing an exit strategy. Therefore, an analysis solely based on design is not appropriate.

Yet the potential for sustainability is based on the ultimate effectiveness of the project's subsequent phases. At the time of this evaluation, there are no legal frameworks, policies nor governance structures and processes achieved within the project. Specifically, there are no outputs/outcomes to pose risks nor to support sustainability as a result of CABSA. Therefore, this aspect cannot be evaluated in a stand-alone manner given that much of the potential effectiveness of future phases of implementation, and consequently their sustainability, rest upon uptake of research for the generation of policies to manage air pollution issues in an equitable manner in the Asia Pacific region. Socially and technically the project has been well accepted by different sorts of partners thus far. Therefore, at the technical level there are no risks identified that can jeopardize socio-economic sustainability of project outputs.

The vision of diverse partners of Phase I is that sustainability of the already attained outputs would be achieved if countries would continue to feed with information and maintain air quality systems and analysis. Yet this is, at times, challenging and a sustainability risk. This due to in-country lack of full transparency in releasing national and local data on air pollution and on emission sources as well as weaknesses in truly having in-country baseline data and systems to monitor air quality, emission inventories, etc. This lack of baseline data is a risk not only to generate scenarios but also for the comprehensive use of the data to control emissions. To bypass to some extent these issues project is conducting activities (such as training workshops) for capacity development to engender sustainability vis-à-vis knowledge, skills, and other capacity-related manners (institutional as well as individual capacities).

Financial risks to sustainability for maintaining the products achieved do exist. That is, the achieved studies and the technical network that the project has begun to generate have no system nor structure to financially maintain achievements, research, and monitoring systems. Therefore, this is another aspect to expand analytically, particularly if the intentions of

subsequent phases are not only to replicate achievements in other countries but also to upgrade the scope of the accomplishments already made.

XI. CONCLUSIONS

This CABSA project was developed with the understanding that air pollution control must be based upon sound scientific research and data, as well as on monitoring and forecasting. CABSA Phase I focused on the Lower Mekong Countries, to reinforce regional air pollution monitoring and forecasting capabilities. UNDP, through RBAP, with support from MOE of the Government of Korea, supported the Asia-Pacific region (with Thailand, Lao PDR and Cambodia as piloting countries in Phase I) to tackle air pollution by introducing a prototype AAQMaP. The overall objective of the project is geared to accelerate structural transformations for sustainable development through multi- stakeholder partnerships within and across government and society. The specific objective is *"Improved, transparent, accurate, and efficient air quality data platform to inform government's investment decisions that promote a cleaner, greener environment."* CABSA II, is an expansion of the first phase of this project (covering three other countries in the region: Indonesia, Mongolia and Vietnam) in collaborative efforts to tackle regional air pollution challenges in these countries also. The aim was and is also to update the Asian Air Quality Management Program and its associated modelling to continue to stimulate governmental national decisions on policies and investments that promote a cleaner environment.

The first phase of this intervention was framed with the intention of expanding to a much broader endeavour to deal with air pollution in Asia Pacific, which is –as is well known-- a key problematic issue in the region. Overall, CABSA Phase I has been a positive undertaking given that its planned and unplanned outputs (data harnessed, research, inter country relations, technical exchanges, etc.) can be used as a baseline jumping point not only for Phase II but also for a more outcome oriented broader development project. Through the comprehensive collection of air quality monitoring data from each country involved in the first phase, providing a detailed overview of pollutant levels in various regions. This data allows for the identification and pinpointing of main sources of air contamination and trends. Data also allows the development of air pollution emission reduction scenarios for partner countries and quantitatively analyses the reduction effects, providing scientific evidence needed to establish effective air quality improvement strategies. Besides data gathered and analysis on air quality monitoring, air emission inventories, and analysis of satellite data, and policy intervention scenario/policy analysis, the project engaged in workshops and generated AAQMaP system.

It is concluded by this assessment that the project has met with evaluation criteria as follows. In the first place, the intervention has been relevant in two aspects. First, in the sheer materiality of dealing with what is one of the most acute environmental issues for the Asia Pacific region. That is, for dealing with air pollution in a sustainable development context whereby it is

clear that the level and perseverance of air contamination is not only affecting variables such as human and ecosystem health but also undermining development achievements made by the countries involved and affected. Second (and in part due the gravity of the issue) because the intervention is coherently aligned with relevant international, regional and national policies and mandates.

The project has been efficiently implemented in the sense that it achieved the expected outputs in a timely manner and within the predicted time frame. Regarding sustainability at the output level, the prospectives are positive if information continues to feed the pilot research system generated by the soon to be completed CABSA first phase and continues to be articulated with the upcoming second phase. Yet the potential for sustainability is based on the ultimate effectiveness of the project's subsequent stages. The effectiveness of the project outputs (which involved mainly research) are a matter to see at future. The project was designed to produce outputs, and the outcomes that may originate out of these outputs are to be seen in future phases of implementation. For instance, the uptake and use of the research generated and to be generated in the near future is the pivot around which effectiveness as well as sustainability could be seen.

The first phase of the project did not fully comprise matters such as sustainable development goals, gender, or the Leave No One Behind agenda. Gender equality and other gender – related issues are foreseen to be interweaved in the upcoming second phase.

An unplanned yet positive result of CABSA Phase I is the beginning of the generation of a spontaneous South – South collaboration network dealing with air pollution in Asia Pacific countries. Including the targeted countries (covering Cambodia, Lao PDR and Thailand for Phase I and supporting Indonesia, Mongolia and Vietnam in Phase II) but also go beyond the targeted countries.

The first phase of the project (being a research pilot) lacked a vision that went beyond air pollution research. That is, although basic analysis and data gathering (including modelling) was highly positive to analyse sources of contamination and other technical aspects, the project per se still is short a vision of how this analysis can be translated into actionable mechanisms that not only include air pollution strictly as a subject but also embraces issues such as policy, transparency, sustainable development, social aspects of air pollution and air contamination, economic tools to confront this problem in the Asia Pacific region.

Based on the above conclusions, as well as of all of the findings of this assessments, a set of recommendations are presented in the following sections to apply for the second phase of CABSA, but also to expand in scope and include broader aims for a potential third phase of

implementation. The recommendations are for a future endeavour to be carried out with the right adjustments for planning and for ensuing implementation, with a programmatic and results oriented approach and with a broader resource base and partnerships. The broadening of the projects is not only intended and recommended by this evaluation to include more countries, but to encompass a broader scope programmatically and conceptually. That is, using the lessons learned and knowledge generated by the first phase of this intervention, and the knowledge and lessons learned to be generated by the ongoing Phase II in order to design and harness a fitting resource base and partnerships for a results-based intervention.

In summary, the data gathered by the concluded phase and what is expected to be gathered in the new implementation second phase can be considered keystone information sources to engender a proactive and much needed larger project in scope that could aid in the control of air pollution in the Asia Pacific region. The potential effectiveness of what has been achieved in the first CABSA phase is high if new phases are designed and resources are leveraged that can broaden scope to be an integrated project that deals with one of the most salient problems in Asia Pacific (that is, with air pollution) in an integrated manner and dealing with the numerous issues affected and affecting by air contamination.

XII. LESSONS LEARNED

- A lesson learnt from Project's research and analysis is that there is a need to focus (throughout the region) on gaps in air quality information among countries given that there are substantial differences in air quality monitoring capabilities observed among between countries. This is due to some countries having well-established real-time monitoring networks while others lack the infrastructure to continuously collect and report air quality data comprehensively, and –given this-- challenges in maintaining consistency and comparability of cross-border data are seen.
- Just the enunciation of cross cutting issues (gender, SDGs, developmental issues, rights approach, and the LNOB framework) in planning is not a sufficient factor for a project to truly incorporate these matters into its implementation, nor in its expected outputs and outcomes.
- When a concept note and initial project design does not leverage sufficient resources to properly meet with planned outcomes and outputs, a redesign needs to take place to render a project implementable in relation to leveraged funds, leveraged resources and concrete leveraged partnerships.
- At times unplanned positive results occur during implementation, such as in this case the ad hoc South-South cooperation among and between partner countries that engenders spontaneously. These matters, if captured properly during implementation, can strengthen a project and redirect its execution to support these matters.

XIII. RECOMMENDATIONS

Recommendations that are considered practical, actionable and feasible and directed to the intended users of the report about what actions to take or decisions to make are provided in the next paragraphs. They are divided into two sections. That is, recommendations for Phase II of the CABSA project and for further programming, being it CABSA Phase III and/or further programming in general. The recommendations are for UNDP / BRH in their totality. The recommendations are based on the findings of this evaluation and not only recommend what could be done to improve effectiveness, efficiency, relevance and sustainability of Phase II and for a potential third phase, but also (to the extent relevant) how these criteria could be achieved in a potential third phase (for instance, through work planning, upscaled design, integrated monitoring).

For Phase II

I. Commence to work on effectiveness, for instance, support research and analysis while "translating" data into policy tools and connecting research to institutional and social policies for uptake of knowledge generated in Phase I and knowledge that commences to be generated in Phase II.
II. Work planning should be carried out in a manner that socio – economic and policy analysis is not left for latter stages of implementation. Since outputs 2 and 3 are not necessarily sequential, especially in this second phase, they should commence to be implemented at the beginning of execution to seek effectiveness, incorporating cutting issues into Phase II as soon as implementation begins, and assuring that what is indicated in planning documents is met (for instance, gender dimension). Regarding gender, include exploring gender analysis and impacts of air pollution from a gender perspective (to ensure targeted interventions address adverse impacts on different gender groups).
III. Incorporate capacity building initiatives (individual and institutional capacity) from the beginning of implementation, using the knowledge harnessed and the knowledge management products from Phase I in order for national counterparts to begin uptake outputs and have the capacity to address air pollution issues.
IV. Strengthen South-South Cooperation horizontally among the partner countries involved in Phase II and draw-in those involved in Phase I in these types of exchanges,

discussing how to maintain and further develop the framework of partnership among participating countries.

V. Use the Phase II period of implementation to catalyse further phases of this initiative, based on findings and achievements of Phase I also.

For a potential third phase and for future programming in general

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I. Planning of future interventions should attend to specific mechanisms to be effective, such as:
   - Design and implement activities, tools and mechanisms that produce uptake and bridge the gap between research / technical information and policy and institutional strengthening. The link between research and institutional / policy outcomes should be specified, proposing and engendering tools that not only carry out analysis (baselines, scenarios, etc.) but also tools for uptake of this information for generating and implementing policy for air pollution control based on scientific evidence.
   - Future phases should not only increase the number of countries but further increase scope of the intervention (based on research already carried out as well as ongoing analysis at the time of CABSA implementation) to make the intervention as originally intended: a proactive developmental project that accelerates structural transformations in an integrated and multivariate manner to deal with air pollution issues in the Asia Pacific Region.
   - Design future components with a results-based approach, based evidently on the data harnessed by the phases being evaluated, to promote change with proper tools for policy makers.
   - Programmatic and management mechanisms should also be inserted in project planning, such as monitoring and reporting plans, to conduct towards efficient and effective implementation that gages results as an effect of the project.

II. Further scope needs to be multivariate and integrated, understanding that to deal with air pollution in an integrated manner a number of tools should be used (evidently based on research), such as:
   - Policy tools and toolkits, instilling uptake of findings and sustainability of outputs/outcomes
   - Institutional strengthening

- Economic tools (market tools)
- Tools that increase the links between the public and the private sectors,
- Financing mechanisms for the application of air pollution control measures and policies.

III. The link between research and institutional / policy outcomes should be specified, proposing and engendering tools that not only carry out analysis (baselines, scenarios, etc.) but also the tools for uptake of this information for generating and implementing policy for air pollution control based on scientific evidence.

IV. Project development should be thorough, including instrument of a results-based endeavour, normally included in a project document (ProDoc). Articulation of different tools could be done designing future projects as a portfolio or in a child-project concept. The tools, inter alia, to be used should be:

- Planning and monitoring tools properly imbedded with risk management, monitoring, and reporting instruments.
- Incorporate clearly mechanisms to attend to cross cutting issues, such as gender, developmental factors, LNOB agenda, and rights approaches and not leave them just as enunciations that may or may not be implemented if just left as such. Social issues fully interweaved not just declaratory (developmental aspects, health, gender, equity, etc.) with proper mechanism to measure effects.
- Design and implement improved communication channels, not only from project to countries and partners (always informing what is being achieved and implemented) but also horizontal communication among the partner countries involved, as well as adequate project management structures and resources.
- Include in design results-based log frame with expected outcomes, a SMART indicator set, capacity building strategies and exit strategies, as well as risk management strategies.

V. Complex projects and programs such as the ones proposed need to broaden resource base (financial as well as technical inputs) and amplify funding to fully support activities and planned outputs as well as planned outcomes (making sure that financing is within UNDP guidelines regarding who can fund an agency intervention). This while supporting CABSA expressed intentions of the need for funders to be proactive and work collectively.

VI. Generate linkages (related to funding but also related as importantly to coherence) and finding partnerships with other key players in the field that deal with air pollution

at different levels. Generating linkages to other agendas important in the air pollution field (such as the Climate Change agenda, health and environment, industrial development, economic growth). Also, engender links with other relevant UN and international agencies (UNEP, UNESCAP, GCF, WHO, UNIDO, Vertical Funds, International Financial Institutions) and other governments within and outside the region.

VII. Further programming and implementation should be formalized, particularly in a multi country framework. Participation of diverse countries should be formal (with letters of agreement, letters of invitation to participate) and not ad hoc. Furthermore, at some level, future projects should inform and articulate work with Country Offices to benefit from the CO links with governments and civil society in the different nations where the project/programme takes part. This is not only to cursorily formalize participation but also to aid in generating ownership of countries involved (given that ownership is a key element for effectiveness and institutional sustainability).

VIII. Include gender responsive activities, tools, and mechanisms (gender analysis, gender action plans, etc.). Project planning documents should capture gender dimensions in the narrative as well as in the corresponding results framework. This would require relevant sections such as outcome, output and activity level to be outlined and articulated, with indicators to measure the progress of gender equality and women's empowerment aspects. A dedicated GEN 3 output with 15 percent of budgeted results framework would need to be assigned for proper implementation.

IX. Promote South – South and Triangular cooperation among and between participating countries, not only to inform but to strengthen regional horizontal cooperation. SSTC also to be used for information sharing.

XIV. ANNEXES

ANNEX 1: SIGNED PLEDGE OF ETHICAL CONDUCT IN EVALUATION

ETHICAL GUIDELINES FOR EVALUATION

PLEDGE OF ETHICAL CONDUCT IN EVALUATION

UNEG United Nations Evaluation Group

By signing this pledge, I hereby commit to discussing and applying the UNEG Ethical Guidelines for Evaluation and to adopting the associated ethical behaviours.

INTEGRITY

I will actively adhere to the moral values and professional standards of evaluation practice as outlined in the UNEG Ethical Guidelines for Evaluation and following the values of the United Nations. Specifically, I will be:

- Honest and truthful in my communication and actions.
- Professional, engaging in credible and trustworthy behaviour, alongside competence, commitment and ongoing reflective practice.
- Independent, impartial and incorruptible.

ACCOUNTABILITY

I will be answerable for all decisions made and actions taken and responsible for honouring commitments, without qualification or exception; I will report potential or actual harms observed. Specifically, I will be:

- Transparent regarding evaluation purpose and actions taken, establishing trust and increasing accountability for performance to the public, particularly those populations affected by the evaluation.
- Responsive as questions or events arise, adapting plans as required and referring to appropriate channels where corruption, fraud, sexual exploitation or abuse or other misconduct or waste of resources is identified.
- Responsible for meeting the evaluation purpose and for actions taken and for ensuring redress and recognition as needed.

RESPECT

I will engage with all stakeholders of an evaluation in a way that honours their dignity, well-being, personal agency and characteristics. Specifically, I will ensure:

- Access to the evaluation process and products by all relevant stakeholders – whether powerless or powerful – with due attention to factors that could impede access such as sex, gender, race, language, country of origin, LGBTQ status, age, background, religion, ethnicity and ability.
- Meaningful participation and equitable treatment of all relevant stakeholders in the evaluation processes, from design to dissemination. This includes engaging various stakeholders, particularly affected people, so they can actively inform the evaluation approach and products rather than being solely a subject of data collection.
- Fair representation of different voices and perspectives in evaluation products (reports, webinars, etc.).

BENEFICENCE

I will strive to do good for people and planet while minimizing harm arising from evaluation as an intervention. Specifically, I will ensure:

- Explicit and ongoing consideration of risks and benefits from evaluation processes.
- Maximum benefits at systemic (including environmental), organizational and programmatic levels.
- No harm. I will not proceed where harm cannot be mitigated.
- Evaluation makes an overall positive contribution to human and natural systems and the mission of the United Nations.

I commit to playing my part in ensuring that evaluations are conducted according to the Charter of the United Nations and the ethical requirements laid down above and contained within the UNEG Ethical Guidelines for Evaluation. When this is not possible, I will report the situation to my supervisor, designated focal points or channels and will actively seek an appropriate response.

_____ _____ (Signature and Date)

Name and Signature: Maria Onestini Date: August 21, 2024

ANNEX 2: EVALUATION TERMS OF REFERENCE

Terms of Reference

PROJECT EVALUATION
Clean Air for Blue Sky Asia Phase I and II (CABSA I and CABSA II)

Project Title: Clean Air for Blue Sky Asia Phase I and Phase II (CABSA I and CABSA II)

Functional Title: Individual Consultant for Project Evaluation

Duration: Estimated 20 days over a period of 3 months (15 August – 15 November 2024), no travel required.

1. Background and context

As air pollution is a growing environmental threat that calls for sustained regional cooperation, decision-makers are looking to the scientific community and private sector for help when monitoring, mapping, and managing these harmful consequences to the overall SDGs agenda. Scientific identification and prediction of the air quality response to emission changes is a prerequisite for an integrated assessment system in developing effective control policies. Tackling the multi-tiered issue of Air Pollution requires scientific big data hub, technology information and knowledge sharing program for integrating energy use, emissions, meteorology, health and cost & benefit impacts.

Over the past decade, the Lower Mekong region has faced major landscape challenges caused by deforestation, human-induced burning of agricultural areas, and forest fires, which is also an important aspect for climate change response in the region. Fires emit air pollutants and other GHGs emissions into the atmosphere further leading to decreased air quality and elevated public health concerns. Consistent with the 2030 Agenda and UNDP Strategic Plan for 2018 to 2021, the objective of the project is geared to accelerate structural transformations for sustainable development through multi- stakeholder partnerships within and across government and society.

Air pollution control must be grounded in sound scientific research and data, given its variable regional impacts depending on the amount of pollutant emissions and intensity, weather phenomena such as rainfall and wind, and topography, etc. The more intractable problem is that it's difficult to deduce the relationship between regional air quality and emission reduction by simply following through with the latter, because the whole photochemical process of having various reactant gases emitted into the air, reacting in the atmosphere, and finally generating pollutants is complex and nonlinear. Diverse identification and efficient prediction of the air quality response to emission changes is a prerequisite for an integrated assessment system in developing effective control policies.

Responding to the challenges and demand from the region, CABSA Phase I work focused on the Lower Mekong Countries, to reinforce regional air pollution monitoring and forecasting capabilities, UNDP, through Regional Bureau for Asia and the Pacific (RBAP), with support from Ministry of Environment (MOE), the Government of Korea, has put forward a value proposition to support Asia-Pacific region (with Thailand, Lao PDR and Cambodia as piloting countries) to tackle air pollution by introducing a prototype AAQMaP.

Clean Air for Blue Sky Asia Phase II, as an expansion from phase I (covering Cambodia, Lao PDR and Thailand), will support Indonesia, Mongolia and Vietnam in their collaborative efforts to tackle regional air pollution challenges. Ultimately, the updated AAQMaP and its modeling will continue to stimulate government's decisions on policies and investments that promote a cleaner, greener environment.

Both CABSA phase I and II are implemented by UNDP using the Direct Implementation Modality (DIM) with the key three outputs:

1) Air quality information gap is addressed in targeted countries through a prototype AAQMaP;

2) National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models;

3) Existing initiatives to address air pollution management and policy measures are scaled-up and catalysed

Project information

Linkage to the UNDP Strategic Plan (2022-2025) Outcome:	**SP Outcome 1:** Structural transformation accelerated, particularly green, inclusive, and digital transitions
Links to Regional Programme Outputs (2022-2025):	**RPD Output 1.4:** Sustainable, scalable and innovative solutions and strategies for Nature, Climate and Energy transformation strengthened through enhanced Climate Promise, nature-based solutions, and transitioning to clean energy and zero-carbon development.
Indicative Project Output(s) with gender marker:	**CABSA I and II:** **Output 1:** Phase 1 of Asian Air Quality Monitoring Platform prototype (GEN1) **Output 2:** Science-based air quality modeling developed, and solutions identified to address regional pollution challenges (GEN1) **Output 3:** A portfolio of actions and initiatives to improve regional air pollution management and policy measures (GEN1)

<table>
<tr><td></td><td>All outputs are GEN I during CABSA I. Output 2 and 3 have been upgraded to GEN 2 during the design of CABSA II, incorporating gender inclusive indicators.</td></tr>
<tr><td>Atlas/Quantum Project ID</td><td>CABSA I: 00132938
CABSA II: 01002432</td></tr>
<tr><td>Total budget (USD):</td><td>CABSA I: $ 419,181.75
CABSA II: $ 415,150</td></tr>
<tr><td>Expenditure at the time of evaluation (USD)</td><td><u>CABSA I</u>

<table><tr><th>Year</th><th>Project ID 124811</th></tr><tr><td>2022</td><td>32,461.58</td></tr><tr><td>2023</td><td>177,361.60</td></tr><tr><td>2024 (as of 31 March 2024)</td><td>410.77</td></tr><tr><td>Total</td><td>210,233.95</td></tr></table>
<u>CABSA II</u>
No expenditures as of May 2024, as implementation just started on 25 April 2024.</td></tr>
<tr><td>Funding Source:</td><td>Republic of Korea/Ministry of Environment (MOE) for both CABSA I and II</td></tr>
<tr><td>Implementing Entity:</td><td>UNDP Bangkok Regional Hub</td></tr>
<tr><td>Project Start and End Date:</td><td>CABSA I: 28 April 2022-31 December 2024
CABSA II: 25 April 2024-28 February 2027</td></tr>
<tr><td>Project End Date:</td><td>31 December 2024</td></tr>
<tr><td>PAC Meeting Date:</td><td>n/a</td></tr>
<tr><td>ProDoc Signature Date:</td><td>CABSA I: 28 April 2022
CABSA II: 25 April 2024</td></tr>
</table>

2. Evaluation Purpose, Scope and Objectives

The evaluation's scope has three folds. Firstly, the evaluation will assess the achievement of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming. The evaluation report promotes accountability and transparency and assesses the extent of project accomplishments. Secondly, the evaluation will take a look at the design and implementation of Clean Air

for Blue Sky Asia, Phase II (CABSA II). Having the evaluation conducted at early stage the implementation of CABSA II will ensure that the evaluation findings and recommendations will help guide course corrections and adaptive management in the early year of the implementation. Lastly, it is expected that findings and recommendations from the evaluation of CABSA I and II will inform the design of CABSA III. An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework, which provides performance and impact indicators for project implementation along with their corresponding means of verification. The timeframe of evaluation covers the beginning of the project (including project design stage) to the time when the evaluation is initiated.

An assessment of project performance will be carried out, based against expectations set out in the respective Project Logical Framework/Results Framework, which provides performance and impact indicators for project implementation along with their corresponding means of verification. The timeframe of evaluation covers the beginning of the project (including project design stage) to the time when evaluation is initiated.

The evaluation will be conducted according to the guidance, rules, and procedures established by UNDP as reflected in the UNDP Evaluation Guidance for Development Projects.

3. Evaluation Criteria and Key Guiding Questions

The evaluation will at a minimum cover the criteria of **relevance/coherence, effectiveness (results/achievements towards objective and expected outcome), efficiency and sustainability (financial, socio-economic, institutional framework & governance).**

The following guiding evaluation questions will be considered. These questions will be refined by the evaluator(s) and agreed with UNDP evaluation stakeholders. The findings from evaluation of CABSA I will be used to inform the implementation of CABSA II and possible scaling up of CABSA III.

Relevance/Coherence:

- To what extent was the project in line with national development priorities, country programme outputs and outcomes, the UNDP Strategic Plan, and the SDGs?
- To what extent does the project contribute to the theory of change for the relevant country and regional programme outcomes?
- To what extent were perspectives of men and women who could affect the outcomes, and those who could contribute information or other resources to the attainment of stated results, taken into account during project design processes?
- To what extent has the project been appropriately responsive to political, legal, economic, institutional, etc., changes in the countries?

Effectiveness:

- To what extent did the project contribute to the country and regional programme outcomes and outputs, the SDGs, the UNDP Strategic Plan, and national development priorities?

- What factors have contributed to achieving, or not, intended country/regional programme outputs and outcomes?
- What factors contributed to effectiveness or ineffectiveness?
- In which areas does the project have the greatest achievements? Why and what have been the supporting factors? How can the project build on or expand these achievements?
- In which areas does the project have the fewest achievements? What have been the constraining factors and why? How can or could they be overcome?
- What, if any, alternative strategies would have been more effective in achieving the project objectives?
- Are the project objectives and outputs clear, practical and feasible within its frame? Do they clearly address women, men and vulnerable groups?
- To what extent have different stakeholders been involved in project implementation?

Efficiency:

- To what extent was the project management structure as outlined in the project document efficient in generating the expected results?
- To what extent have the UNDP project implementation strategy and execution been efficient and cost-effective?
- To what extent has there been an economical use of financial and human resources? Have resources (funds, male and female staff, time, expertise, etc.) been allocated strategically to achieve outcomes?
- To what extent have resources been used efficiently? Have activities supporting the strategy been cost-effective?
- To what extent have project funds and activities been delivered in a timely manner?

Sustainability:

- To what extent will target men, women and vulnerable people benefit from the project interventions in the long-term?
- Are there any social or political risks that may jeopardize sustainability of project outputs and the project contributions to country programme outputs and outcomes?
- Do the legal frameworks, policies and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?
- To what extent are lessons learned documented by the project team on a continual basis and shared with appropriate parties who could learn from the project?
- To what extent do UNDP interventions have well-designed and well-planned exit strategies which include a gender dimension?
- What could be done to strengthen exit strategies and sustainability in order to support female and male project beneficiaries as well as marginalized groups?

Evaluation questions on cross-cutting issues:

Human rights:

- To what extent have poor, indigenous and physically challenged, women, men and other disadvantaged and marginalized groups benefited from the work of UNDP in the country?

Gender equality:

All evaluation criteria and evaluation questions applied need to be checked to see if there are any further gender dimensions attached to them, in addition to the stated gender equality questions.

- To what extent have gender equality and the empowerment of women been addressed in the design, implementation and monitoring of the project?
- To what extent has the project promoted positive changes in gender equality and the empowerment of women? Did any unintended effects emerge for women, men or vulnerable groups?

Disability:

- Were persons with disabilities consulted and meaningfully involved in programme planning and implementation?

4. Methodology

The evaluation report must provide evidence-based information that is credible, reliable, and useful. The evaluation should employ a combination of qualitative and quantitative evaluation methods and instruments. The evaluation must use gender-responsive methods, data analysis and tools to ensure that gender equality and women's empowerment, other cross-cutting issues and SDGs are incorporated into the evaluation. The evaluator is expected to follow a participatory and consultative approach that ensures close engagement with the evaluation managers, implementing partners and male and female direct beneficiaries. The methodological tools and approaches should include, but is not limited to the following:

- **Document review** (to include both CABSA I and CABSA II project). This would include a review of all relevant documentation, inter alia.
  - Project document (contribution agreement)
  - Theory of change and results framework
  - Project quality assurance reports
  - Annual workplans
  - Activity designs
  - Consolidated quarterly and annual reports
  - Results-oriented monitoring report
  - Highlights of project board meetings
  - Technical/financial monitoring reports

- **Interviews and meetings** with key stakeholders (men and women) such as key government counterparts, donor community members, representatives of key civil society organizations, UNDP Country Office and implementing partners:
  - Semi-structured interviews, based on questions designed for different stakeholders based on evaluation questions around relevance, coherence, effectiveness, efficiency, and sustainability.
  - Key informant and focus group discussions with men and women, beneficiaries and stakeholders.
  - All interviews with men and women should be undertaken in full confidence and anonymity. The evaluation report should not assign specific comments to individuals.
- **Surveys and questionnaires** including male and female participants in the project, UNDP CO staff and/or surveys and questionnaires to other stakeholders at strategic and programmatic levels.
- **Other methods** such as outcome mapping, observational visits, group discussions, etc.
- **Data review and analysis** of monitoring and other data sources and methods. To ensure maximum validity, reliability of data (quality) and promote use, the evaluation team will ensure triangulation of the various data sources.
- **Gender and human rights lens**. All evaluation products need to address gender, disability, and human right issues. The evaluation methods and sampling frame need to address the diversity of stakeholders affected by the intervention, particularly the most vulnerable, where appropriate.

The final methodological approach including interview schedule, field visits and data to be used in the evaluation should be clearly outlined in the inception report and fully discussed and agreed between UNDP, key stakeholders and the evaluators.

5. Evaluation Products (deliverables)

The evaluator(s) is expected to deliver the following outputs:

	Deliverables	Activity
1	Evaluation inception report[6] including workplan[7] and methodology	• Sharing of relevant document with evaluator • Desk review of project documents • Prepare and submit the inception report (10-15 pages), including work plan* and methodology, as well as a list of stakeholders to be interviewed • Evaluator clarifies objectives, methodology and schedule of the evaluation in meeting briefing with UNDP
2	Evaluation debriefing /Presentation[8]	• Data collection, consultations • Debriefing of initial findings to UNDP and stakeholder
3	Draft evaluation report[9]	• Prepare draft evaluation report (A length of 40 to 60 pages including executive summary but excluding annexes is suggested) • Draft report submission, consolidated UNDP and stakeholders' comments to the draft report • Full draft report, using guidelines on report content in ToR Annex C with annexes.

[6] **The inception report** should be carried out following and based on preliminary discussions with Evaluation Manager and UNDP evaluation reference group after the desk review and should be produced before data collection. The inception report and methodology will be discussed at an inception meeting between the evaluator, Evaluation Manager and UNDP evaluation reference group. Inception report must include a sample evaluation matrix (see Annex D).

[7] **The workplan** should provide clear timeline of how and when the evaluation steps will be undertaken. **The evaluation methodology** should provide a specific assessment framework, covering both quantitative and qualitative dimensions, with a detailed list of required stakeholders who need to be interviewed. A simple stakeholder analysis for conducting interviews and evaluations can be conducted. The draft methodology can be presented in the evaluation inception report once the consultant has completed the desk review of the project related documents.

[8] **Data collection:** Upon approval of the inception report, the Consultant is expected to carry out the evaluation according to the proposed methodology and data sources. After completion of initial data collection or before sharing the draft report, the evaluator should present **preliminary debriefing** and findings to Evaluation Manager and UNDP evaluation reference group.

[9] The Evaluator should submit **a comprehensive draft report** consisting of major findings and recommendations for future course of action analysis, as well as success indicators used, and an overview of the effectiveness of the programme from the perspective of various stakeholders. The Evaluation Manager and Evaluation Reference Group will review the draft evaluation report to ensure that it meets the required quality standards and covers all agreed components and contents of the evaluation report as highlighted in the UNDP evaluation guidelines. Detailed comments and feedback on the draft report will be provided to the consultant, and discussions may be held to provide clarifications, as necessary.

4	Final evaluation report[10] + Audit Trail[11] + Cleaned datasets (if any)	• Submission of revised final report* and evaluation Audit Trail in which the evaluation details how all received comments have (and have not) been addressed in the final evaluation report (See template in ToR Annex H)

[10] **The final report** is expected to capture findings and recommendations on both the programme approach, management, and performance. Suggestions and comments gathered during the briefing session will be taken into consideration. The minimum structure of the evaluation report (to be written in the English language) is Executive summary; Introduction; Methodological approach; Evaluation findings; Lessons learnt; Recommendations for future programme interventions; Conclusions; Relevant annexes.

[11] **Audit trail:** The programme unit, Evaluation Manager and Evaluation Reference Group in the evaluation should review the draft evaluation report and provide an amalgamated set of comments to the evaluator within an agreed period of time, as outlined in these guidelines. Comments and changes by the evaluator in response to the draft report should be retained by the evaluator to show how they have addressed comments.

6. Time frame for the evaluation process

Following is the anticipated number of working days required in each evaluation process with total number of working days not exceeding 20 working days during 15 August – 15 November 2024. The evaluation consultant is expected to work toward following tentative timelines to achieve the stated deliverables. The tentative timeframe is as follows:

Phase	Tasks	Estimated # of days	Tentative date of completion
Phase 1: Desk review and inception	Completion of desk review, submission of inception report including workplan and methodology	7 days	~~30 July 2024~~ 6 September 2024
Phase 2: Data collection	Completion of data collection and consultations, debriefing/presentation of the initial findings	5 days	~~16 August 2024~~ 23 September 2024
Phase 3: Evaluation report writing	Submission of draft evaluation report	5 days	~~30 August 2024~~ 14 October 2024
	Submission of revised and final evaluation report	3 days	~~20 September 2024~~ 31 October 2024

7. Evaluator required competencies

An individual evaluator will conduct the Final evaluation. The evaluator shall have prior experience in evaluating similar projects. Experience in conducting UNDP evaluations in Cambodia, Lao, Thailand or a regional project is an advantage. The evaluator cannot have participated in the project preparation, formulation and/or implementation (including the writing of the project document) and should not have a conflict of interest with the project's related activities.

Required qualifications:

Education

- At least Master's degree in a discipline relevant to environment and natural resource management, environmental engineering & science, computer science, data science, development studies, business administration or other closely related field;

Experience

- Minimum 5 years of relevant professional experience of project evaluation, particularly UNDP project evaluations, with proven knowledge of evaluation methodologies;
- Previous experiences in project evaluation/project design/implementation in relevant thematic areas (i.e. environment, climate change, air pollution, rural development, etc.);

- Experience of working in *Asia especially South-East Asian countries* having technical knowledge in the targeted focal area(s) is an advantage;
- Advanced understanding of data-collection methodologies and data analysis process
- Demonstrated understanding of issues related to gender and & climate change; experience in gender sensitive evaluation and analysis;

Core competencies

- Demonstrates professional competence to meet responsibilities and post requirements and is conscientious and efficient in meeting commitments, observing deadlines and achieving results;
- Results-Orientation: Plans and produces quality results to meet established goals, generates innovative, practical solutions to challenging situations;
- Communication: Excellent communication skills, including the ability to convey complex concepts and Guidelines, both orally and in writing, in a clear and persuasive style tailored to match different audiences;
- Teamwork: Ability to interact, establish and maintain effective working relations with a culturally diverse team;
- Client orientation: Ability to establish and maintain productive partnerships with national partners and stakeholders and pro-activeness in identifying of beneficiaries and partners' needs, and matching them to appropriate solutions

Core values

- Demonstrates integrity and fairness by modelling UN values and ethical standards;
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability

Language

- Excellent communication skills in English

8. Institutional and Implementation arrangements

The principal responsibility for managing the evaluation resides with the Commissioning Unit. The Commissioning Unit for this project's evaluation is UNDP Bangkok Regional Hub. The Commissioning Unit, through the Environment team will contract the evaluator. The evaluation reference group will contribute to quality assurance of evaluation and provide comments on the report. The Project Team will be responsible for liaising with the Consultant to provide all relevant documents, set up stakeholder interviews, and arrange field visits. Please refer to table below for further details;

Who (Responsible)	What (Responsibilities)
PMU Coordinator, BRH Regional Programme Management Unit (R-PMU) as Evaluation Manager	• Assure smooth, quality, and independent implementation of the evaluation with needful guidance from UNDP's Senior Management. • Approve hiring of the evaluator by reviewing proposals and complete the recruitment process. • Ensure the independent implementation of the evaluation process. • Approve each step of the evaluation • Supervise, guide, and provide feedback and comments to the evaluation consultants. • Ensure quality of the evaluation. • Ensure the Management Response and action plans are fully implemented
Environment team, UNDP BRH and project teams at Country Offices	• Draft ToR to be reviewed and finalized by the *Evaluation Manager* • Support in hiring the consultant • Provide required information, furnishing documents for review to the consultant team. • Provide feedback and comments on inception report and draft reports • Provide necessary information and coordination with different stakeholders including donor communities • Prepare management response and action plan and follow up the implementation • Logistic arrangements, such as for support in setting up stakeholder meetings, arranging field visits and coordinating with the Government.
Evaluation reference group	• Provide feedback and comments on inception report and draft reports • Participate in debriefing session and provide feedback
Evaluation Consultant	• Review the relevant documents. • Develop and submit a draft and final inception report • Conduct evaluation. • Maintain ethical considerations. • Develop and submit a draft evaluation report • Organize meeting/consultation to discuss the draft report • Incorporate inputs and feedback in draft report

	• Submit final report with due consideration of quality and effectiveness • Organize sharing of evaluation report • Evaluator is expected to work within Asia-Pacific working hours, particularly for the interviews.

9. Duty station and travel

The Consultant will be home-based with no travel required. The consultant is expected to be available during business hours in Thailand and the countries under review, particularly for interviews. All interviews will be conducted virtually.

10. Evaluation ethics

"This evaluation will be conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation' - http://www.unevaluation.org/document/detail/2866. The consultant must safeguard the rights and confidentiality of information providers, interviewees, and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The consultant must also ensure security of collected information before and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The information knowledge and data gathered in the evaluation process must also be solely used for the evaluation and not for other uses with the express authorization of UNDP and partners."

11. Schedule of payments

The contract price will be a fixed output- based price regardless of the extension of the herein specified duration. Payments will be made upon completion of the deliverables/outputs and as per the percentages below:

Deliverables	Payment (% of total contract amount)
1) On approval of workplan and methodology and inception report	20%
2) Debriefing after data collection	10%
3) On submission of draft evaluation report	40%
4) On approval of revised and final evaluation report incorporating and audit trail	30%

It is important to note that multiple iterations of the report may be required for the satisfactory completion of the report.

Application process and selection criteria

Interested individual consultants must submit the following documents/information to demonstrate their qualifications. Please group them into one (1) single PDF document as the application only allows to upload maximum one document:

Recommended Presentation of Proposal:

a) **Letter of Confirmation of Interest and Availability** using the template[12] provided by UNDP;
b) **CV** and a **Personal History Form** (P11 form[13]);
c) **Financial Proposal** that indicates the all-inclusive fixed total contract price (including both consultancy fee as well as travel cost for 4-day in country visit to Phnom Penh, Cambodia) as per template attached to the Letter of Confirmation of Interest template. If an applicant is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

Criteria for Evaluation of Proposal: Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method – where the educational background and experience on similar assignments will be weighted at 70% and the price proposal will weigh as 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP's General Terms and Conditions will be awarded the contract.

Technical Criteria for Evaluation for internationals (Maximum 70 points):

- **Criteria 1** - At least Master's degree in a discipline relevant to environment and natural resource management, environmental engineering & science, computer science, data science, development studies, business administration or other closely related field **(Max 5 Points)**
- **Criteria 2** - Minimum 5 years of relevant professional experience of project evaluation, particularly UNDP project evaluations, with proven knowledge of evaluation methodologies **(Max 25 Points)**
- **Criteria 3** - Previous experiences in project evaluation/project design/implementation in relevant thematic areas (i.e. environment, climate change, air pollution, rural development, etc **(Max 25 Points)**
- **Criteria 4** - Experience of working in *Asia especially South-East Asian countries* having technical knowledge in the targeted focal area(s) is an advantage **(Max 10 Points)**
- **Criteria 5** - Advanced understanding of data-collection methodologies and data analysis process **(Max 5 Points)**

Financial Evaluation (Total 30 marks)

[12] https://intranet.undp.org/unit/bom/pso/Support%20documents%20on%20IC%20Guidelines/Template%20for%20Confirmation%20of%20Interest%20and%20Submission%20of%20Financial%20Proposal.docx

[13] http://www.undp.org/content/dam/undp/library/corporate/Careers/P11_Personal_history_form.doc

All technical qualified proposals will be scored out 30 based on the formula provided below.

The maximum points (30) will be assigned to the lowest financial proposal. All other proposals received points according to the following formula:

p = y (μ/

Where:

- p = points for the financial proposal being evaluated;
- y = maximum number of points for the financial proposal;
- μ = price of the lowest priced proposal;
- z = price of the proposal being evaluated.

UNDP is committed to achieving workforce diversity in terms of gender, nationality and culture. Individuals from minority groups, indigenous groups and persons with disabilities are equally encouraged to apply. All applications will be treated with the strictest confidence.

UNDP does not tolerate sexual exploitation and abuse, any kind of harassment, including sexual harassment, and discrimination. All selected candidates will, therefore, undergo rigorous reference and background checks.

12. TOR Annexes

- ToR Annex A: Project Logical/Results Framework
- ToR Annex B: Project Information Package to be reviewed by evaluation team
- ToR Annex C: Content of the evaluation report
- TOR Annex D Evaluation Criteria Matrix template
- ToR Annex E: UNEG Code of Conduct for Evaluators
- ToR Annex F: evaluation Audit Trail
- TOR Annex G: UNDP Evaluation: complaints and dispute settlement and reporting wrongdoing process

TOR approved by

_____

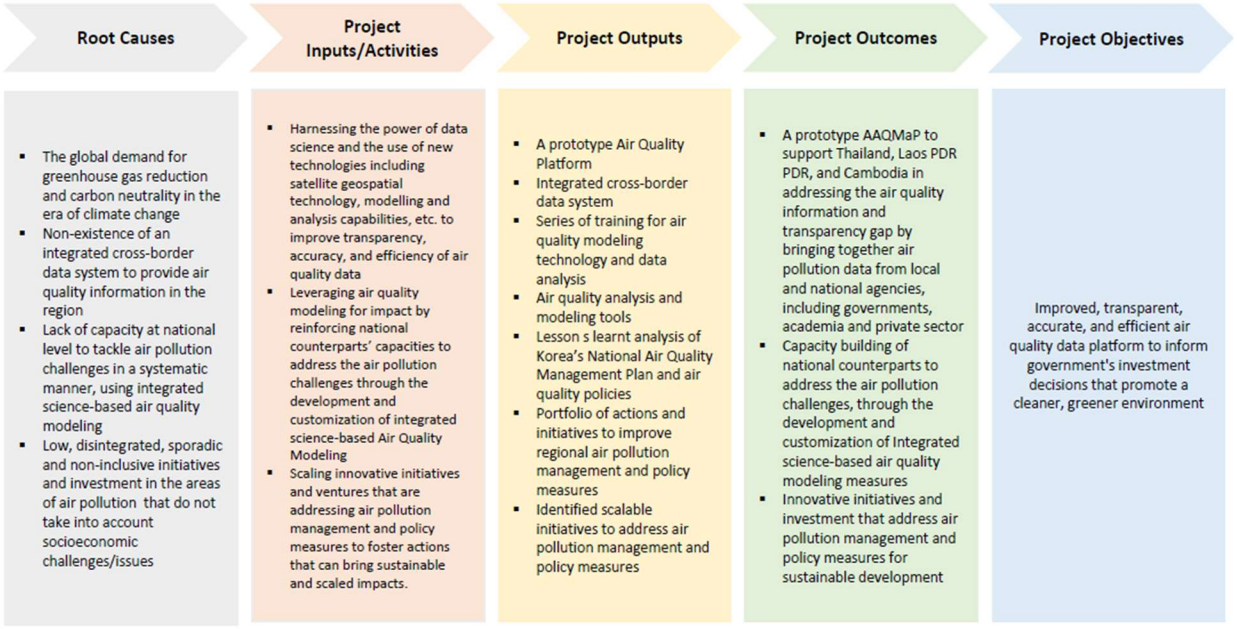
PMU Coordinator/Evaluation manager

TOR Annex A: Project Logical/Results Framework and Theory of Change

For CABSA I

Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework: Outcome 1: Inclusive and sustainable structural transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions								
Outcome indicators as stated in the Regional Programme Results and Resources Framework: 1.3. Number of Asia-Pacific cities in most polluted 100 cities in the world								
Applicable Outcome(s) from the UNDP Strategic Plan: SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions								
Project title and Atlas Project Number: Clean Air for Blue Sky Asia								
Expected Outputs	Output Indicators	Data Source	Baseline		Targets			Data Collection Methods and Risks
			Value	Year	2022	2023	2024	
Output 1: Air quality information gap is addressed in targeted countries (Thailand, Laos PDR, and Cambodia), through a prototype Asian Air Quality Management Program (AAQMaP)	1.1 % of data sets collected from various observations and sources needed to AAQMaPs	• Data generation to harmonize modeling input	0	2021	60	80	90	• Surveys • Monitoring
	1.2 A comprehensive assessment completed to identify air quality information gap in targeted countries	• Project Monitoring Reports	NO	2021	YES	YES	YES	• Project Monitoring Reports
	1.3 % increase in monthly users/visitors of a prototype Air Quality Platform (Baseline is the no. of users at the launch of the AAQMaP, assuming Q3 of 2023)	• System generated data	0%	Q3-2022	20%	40%	60%	• System generated data
Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models	2.1 Number of generating scenarios and analysis for air quality modeling by country technology and data analysis	• System generated scenario and reports	0	2022	0	15	30	• System generated scenario and reports
	2.2 Number of people participated in training courses on air quality modeling technology and data analysis disaggregated by gender	• Project Monitoring Reports	0	2022	0	M20 F10	M40 F20	• Monitoring • Reporting
Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up and catalized	3.1 Number of identified scalable initiatives to address air pollution management and policy measures	• Project Monitoring Reports • Independent Evaluation	0	2022	0	1	3	• Assessment • Feedback from partners and beneficiaries

Theory of Change for Clean Air for Blue Sky Asia



For CABSA II

VI. RESULTS AND RESOURCES FRAMEWORK

Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework:
Outcome 1: Inclusive and sustainable structural transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions

Outcome indicators as stated in the Regional Programme Results and Resources Framework:
1.3. Number of Asia-Pacific cities in most polluted 100 cities in the world

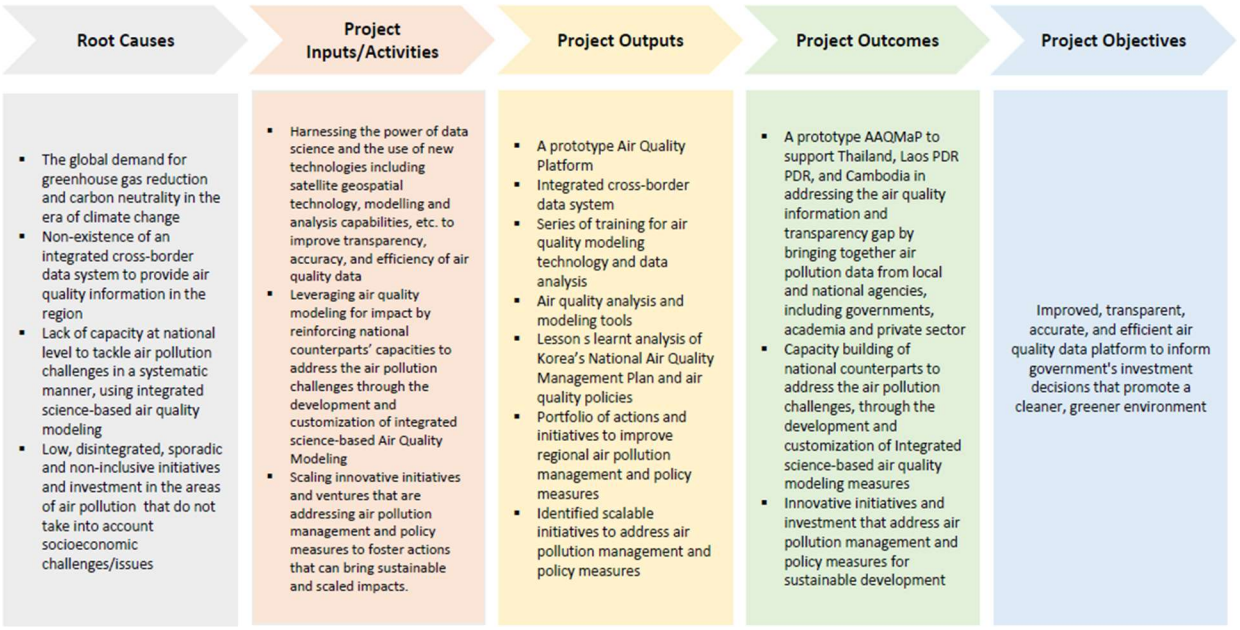
Links to Regional Programme Outputs (2022-2025):
RPD Output 1.4: Sustainable, scalable and innovative solutions and strategies for Nature, Climate and Energy transformation strengthened through enhanced Climate Promise, nature-based solutions, and transitioning to clean energy and zero-carbon development.
RPD indicator 1.4.4 Number of countries participating in transboundary and regional strategic cooperation for sustainable natural resources management
Baseline (2022): 3 Target (2026): 6

Applicable Outcome(s) from the UNDP Strategic Plan:
SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions

Project title and Atlas Project Number: Clean Air for Blue Sky Asia

Expected Outputs	Output Indicators	Data Source	Baseline		Targets			Data Collection Methods and Risks
			Value	Year	2024	2025	2026	
Output 1: Air quality information gap is addressed in targeted countries (Indonesia, Mongolia, and Vietnam, through Asian Air Quality Management Program (AAQMaP)	1.1 % of data sets collected from various observations and sources needed to AAQMaP	• Data generation to harmonize modeling input	0	2022	60	80	90	• Surveys • Monitoring
	1.2 A comprehensive assessment completed to identify air quality information gap in targeted countries	• Project Monitoring Reports	NO	2022	YES	YES	YES	• Project Monitoring Reports
	1.3 % increase in monthly users/visitors of Air Quality Platform (Baseline is the no. of users at the launch of the AAQMaP)	• System generated data	0%	2022	20%	40%	60%	• System generated data
Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models	2.1 Number of generating scenarios and analysis for air quality modeling by country technology and data analysis	• System generated scenario and reports	0	2022	0	15	30	• System generated scenario and reports
	2.2 Number of people participated in training courses on air quality modeling technology and data analysis disaggregated by gender (50% are women)	• Project Monitoring Reports	0	2022	0	M 15 F 15	M 30 F30	• Monitoring • Reporting
	2.3 Number of scenarios are considered to address gender challenges in air quality modeling	Project Monitoring Reports	0	2022	0	5	10	System generated scenario and reports
Output 3: Existing gender-responsive initiatives to address air pollution management and policy measures are scaled-up and catalyzed	3.1 Number of identified gender responsive scalable initiatives to address air pollution management and policy measures	• Project Monitoring Reports • Independent Evaluation	0	2022	0	1	3	• Assessment • Feedback from partners and beneficiaries
	3.2 Extent to use of results as an advocacy tool to promote gender equality/women's participation in air pollution reduction policies/recommendation	Project Monitoring Report	1 (none)	2022	2 (very partial)	3 (partial)	4 (large)	Assessment And/or feeback from partners and beneficiaries;

Theory of Change for Clean Air for Blue Sky Asia Phase II



TOR Annex B: Project Information Package to be reviewed by evaluation team

#	Item (electronic versions preferred if available)
1	UNDP Engagement Facility concept note with all annexes
2	UNDP Social and Environmental Screening Procedure (SESP) and associated management plans (if any)
3	Inception Workshop Report
4	Progress reports (quarterly, semi-annual or annual, with associated workplans and financial reports)
5	Financial data, including actual expenditures by project outcome, including management costs, and including documentation of any significant budget revisions
6	Electronic copies of project outputs (booklets, manuals, technical reports, articles, etc.)
7	Sample of project communications materials
8	Summary list of formal meetings, workshops, etc. held, with date, location, topic, and number of participants
9	List and contact details for project staff, key project stakeholders, including Project Board members, RTA, Project Team members, and other partners to be consulted
10	Project deliverables that provide documentary evidence of achievement towards project outcomes

TOR Annex C: Content of the evaluation report

This evaluation report template is intended to serve as a guide for preparing meaningful, useful and credible evaluation reports that meet quality standards. It does not prescribe a definitive section-by section format that all evaluation reports should follow. Rather, it suggests the areas of content that should be included in a quality evaluation report.

The evaluation report should be complete and logically organized. It should be written clearly and be understandable to the intended audience. In a country context, the report should be translated into local languages whenever possible. The report should include the following:

1. **Title** and opening pages should provide the following basic information:

- Name of the evaluation intervention.
- Time frame of the evaluation and date of the report.
- Countries of the evaluation intervention.
- Names and organizations of evaluators.
- Name of the organization commissioning the evaluation.
- Acknowledgements.

2. **Project and evaluation information** details to be included in all final versions of evaluation reports (non-GEF) on second page (as one page):

Project/outcome Information		
Project/outcome title		
Atlas ID		
Corporate outcome and Output		
Country		
Region		
Date project document signed		
Project dates	Start	Planned end
Total committed budget		
Project expenditure at the time of evaluation		
Funding source		
Implementing party		
Evaluation information		
Evaluation type (project/ outcome/thematic/country programme, etc.)		

Final/midterm review/ other		
Period under evaluation	Start	End
Evaluator(s)		
Evaluator email address		
Evaluation dates	Start	Completion

3. **Table of Contents**, including boxes, figures, tables, and annexes with page references.
4. **List of Acronyms** and abbreviations.
5. **Executive Summary** (four/ five page maximum). A stand-alone section of two to three pages that should:
   - Briefly describe the intervention of the evaluation (the project(s), programme(s), policies, or other intervention) that was evaluated.
   - Explain the purpose and objectives of the evaluation, including the audience for the evaluation and the intended uses.
   - Describe key aspects of the evaluation approach and methods.
   - Summarize principal findings, conclusions and recommendations.
6. **Introduction**
   - Explain why the evaluation was conducted (the purpose), why the intervention is being evaluated at this point in time, and why it addressed the questions it did.
   - Identify the primary audience or users of the evaluation, what they wanted to learn from the evaluation and why, and how they are expected to use the evaluation results.
   - Identify the intervention being evaluated (the project(s) programme(s) policies or other intervention).
   - Acquaint the reader with the structure and contents of the report and how the information contained in the report will meet the purposes of the evaluation and satisfy the information needs of the intended users.
7. **Description** of the intervention provides the basis for report users to understand the logic and assess the merits of the evaluation methodology and understand the applicability of the evaluation results. The description needs to provide sufficient detail for the report user to derive meaning from the evaluation. It should:
   - Describe what is being evaluated, who seeks to benefit and the problem or issue it seeks to address.
   - Explain the expected results model or results framework, implementation strategies and the key assumptions underlying the strategy / theory of change.
   - Link the intervention to national priorities, UNSDCF priorities, corporate multi-year funding frameworks or Strategic Plan goals, or other programme or country-specific plans and goals.
   - Identify the phase in the implementation of the intervention and any significant changes (e.g., plans, strategies, logical frameworks, theory of change) that have occurred over time, and explain the implications of those changes for the evaluation.
   - Identify and describe the key partners involved in the implementation and their roles.

- Include data and an analysis of specific social groups affected. Identify relevant crosscutting issues addressed through the intervention, i.e., gender equality, human rights, vulnerable/ marginalized groups, leaving no one behind.
- Describe the scale of the intervention, such as the number of components (e.g., phases of a project) and the size of the target population (men and women) for each component.
- Indicate the total resources, including human resources and budgets.
- Describe the context of the social, political, economic, and institutional factors, and the geographical landscape within which the intervention operates, and explain the challenges and opportunities those factors present for its implementation and outcomes.
- Point out design weaknesses (e.g., intervention logic, theory of change) or other implementation constraints (e.g., resource limitations).

8. **Evaluation Scope and Objectives**. The report should provide a clear explanation of the evaluation's scope, primary objectives and main questions.
   - Evaluation scope. The report should define the parameters of the evaluation, for example, the time period, the segments of the target population and geographic area included, and which components, outputs or outcomes were or were not assessed.
   - Evaluation objectives. The report should spell out the types of decisions the evaluation will feed into, the issues to be considered in making those decisions and what the evaluation will need to achieve to contribute to those decisions.
   - Evaluation criteria. The report should define the evaluation criteria or performance standards used45 and explain the rationale for selecting those particular criteria.
   - Evaluation questions. The report should detail the main evaluation questions addressed by the evaluation and explain how the answers to those questions address the information needs of users.
9. **Evaluation Approach and Methods**. The evaluation report should describe in detail the selected methodological approaches, methods and analysis; the rationale for their selection; and how, within the time and money constraints, the approaches and methods employed yielded data that helped to answer the evaluation questions and achieved the evaluation purposes. The report should specify how gender equality, disability, vulnerability and social inclusion were addressed in the methodology, including how data collection and analysis methods integrated gender considerations, use of disaggregated data and outreach to diverse stakeholder groups. The description should help the report users judge the merits of the methods used in the evaluation and the credibility of the findings, conclusions and recommendations. The description of methodology should include discussion of each of the following:
   - Evaluation approach.
   - Data sources: the sources of information (documents reviewed and stakeholders) as well as the rationale for their selection and how the information obtained addressed the evaluation questions.
   - Sample and sampling frame. If a sample was used, describe the sample size and characteristics, the sample selection criteria; the process for selecting the sample (e.g. random, purposive); if applicable, how comparison and treatment groups were assigned; and the extent to which the

sample is representative of the entire target population, including discussion of the limitations of sample for generalizing results.

- Data collection procedures and instruments: methods or procedures used to collect data, including discussion of data-collection instruments (e.g., interview protocols), their appropriateness for the data source, and evidence of their reliability and validity, as well as gender-responsiveness.
- Performance standards: the standard or measure that will be used to evaluate performance relative to the evaluation questions (e.g. national or regional indicators, rating scales).
- Stakeholder participation: who participated and how the level of involvement of men and women contributed to the credibility of the evaluation and the results.
- Ethical considerations: including the measures taken to protect the rights and confidentiality of informants (see UNEG 'Ethical Guidelines for Evaluators' for more information).
- Background information on evaluators: the composition of the evaluation team, the background and skills of team members, and the appropriateness of the technical skill mix, gender balance and geographical representation for the evaluation.
- Major limitations of the methodology should be identified and openly discussed, as well as any steps taken to mitigate them.

10. **Data Analysis.** The report should describe the procedures used to analyse the data collected to answer the evaluation questions. It should detail the various steps and stages of analysis that were carried out, including the steps to confirm the accuracy of data and the results for different stakeholder groups (men and women, different social groups, etc.). The report should also discuss the appropriateness of the analyses to the evaluation questions. Potential weaknesses in the data analysis and gaps or limitations of the data should be discussed, including their possible influence on the way findings may be interpreted and conclusions drawn.
11. **Findings** should be presented as statements of fact that are based on analysis of the data. They should be structured around the evaluation questions so that report users can readily make the connection between what was asked and what was found. Variances between planned and actual results should be explained, as well as factors affecting the achievement of intended results. Assumptions or risks in the project or programme design that subsequently affected implementation should be discussed. Findings should reflect gender equality and women's empowerment, disability and other cross-cutting issues, as well as possible unanticipated effects.
12. **Conclusions** should be comprehensive and balanced and highlight the strengths, weaknesses and outcomes of the intervention. They should be well substantiated by the evidence and logically connected to evaluation findings. They should respond to key evaluation questions and provide insights into the identification of and/or solutions to important problems or issues pertinent to the decision-making of intended users, including issues in relation to gender equality and women's empowerment as well as to disability and other cross-cutting issues.
13. **Recommendations.** The report should provide a reasonable number of practical, actionable and feasible recommendations directed to the intended users of the report about what actions to take or decisions to make. The recommendations should be specifically supported by the evidence and linked to the findings and conclusions around key questions addressed by the evaluation. They

should address sustainability of the initiative and comment on the adequacy of the project exit strategy, if applicable. Recommendations should also provide specific advice for future or similar projects or programming. Recommendations should address any gender equality and women's empowerment issues and priorities for action to improve these aspects. Recommendations regarding disability and other cross-cutting issues also need to be addressed.

14. **Lessons Learned.** As appropriate and/or if requested in the TOR, the report should include discussion of lessons learned from the evaluation, that is, new knowledge gained from the particular circumstance (intervention, context, outcomes, even evaluation methods) that are applicable to a similar context. Lessons should be concise and based on specific evidence presented in the report. Gender equality and women's empowerment, disability and other cross-cutting issues should also be considered.
15. **Report Annexes**. Suggested annexes should include the following to provide the report user with supplemental background and methodological details that enhance the credibility of the report:
    - TOR for the evaluation.
    - Additional methodology-related documentation, such as the evaluation matrix and data-collection instruments (questionnaires, interview guides, observation protocols, etc.) as appropriate.
    - List of individuals or groups interviewed or consulted, and sites visited. This can be omitted in the interest of confidentiality if agreed by the evaluation team and UNDP.
    - List of supporting documents reviewed.
    - Project or programme results model or results framework.
    - Summary tables of findings, such as tables displaying progress towards outputs, targets, and goals relative to established indicators.
    - Pledge of ethical conduct in evaluation signed by evaluators.

ToR Annex D: Evaluation Criteria Matrix template

Relevant eval criteria	Key questions	Specific sub-questions	Data Sources	Data Collection methods/tools	Indicators/success standards	Methods of data analysis

ToR Annex E: Pledge of Ethical Conduct in Evaluation

ETHICAL GUIDELINES FOR EVALUATION

PLEDGE OF ETHICAL CONDUCT IN EVALUATION

UNEG United Nations Evaluation Group

By signing this pledge, I hereby commit to discussing and applying the UNEG Ethical Guidelines for Evaluation and to adopting the associated ethical behaviours.

INTEGRITY

I will actively adhere to the moral values and professional standards of evaluation practice as outlined in the UNEG Ethical Guidelines for Evaluation and following the values of the United Nations. Specifically, I will be:

- Honest and truthful in my communication and actions.
- Professional, engaging in credible and trustworthy behaviour, alongside competence, commitment and ongoing reflective practice.
- Independent, impartial and incorruptible.

ACCOUNTABILITY

I will be answerable for all decisions made and actions taken and responsible for honouring commitments, without qualification or exception; I will report potential or actual harms observed. Specifically, I will be:

- Transparent regarding evaluation purpose and actions taken, establishing trust and increasing accountability for performance to the public, particularly those populations affected by the evaluation.
- Responsive as questions or events arise, adapting plans as required and referring to appropriate channels where corruption, fraud, sexual exploitation or abuse or other misconduct or waste of resources is identified.
- Responsible for meeting the evaluation purpose and for actions taken and for ensuring redress and recognition as needed.

RESPECT

I will engage with all stakeholders of an evaluation in a way that honours their dignity, well-being, personal agency and characteristics. Specifically, I will ensure:

- Access to the evaluation process and products by all relevant stakeholders – whether powerless or powerful – with due attention to factors that could impede access such as sex, gender, race, language, country of origin, LGBTQ status, age, background, religion, ethnicity and ability.
- Meaningful participation and equitable treatment of all relevant stakeholders in the evaluation processes, from design to dissemination. This includes engaging various stakeholders, particularly affected people, so they can actively inform the evaluation approach and products rather than being solely a subject of data collection.
- Fair representation of different voices and perspectives in evaluation products (reports, webinars, etc.).

BENEFICENCE

I will strive to do good for people and planet while minimizing harm arising from evaluation as an intervention. Specifically, I will ensure:

- Explicit and ongoing consideration of risks and benefits from evaluation processes.
- Maximum benefits at systemic (including environmental), organizational and programmatic levels.
- No harm. I will not proceed where harm cannot be mitigated.
- Evaluation makes an overall positive contribution to human and natural systems and the mission of the United Nations.

I commit to playing my part in ensuring that evaluations are conducted according to the Charter of the United Nations and the ethical requirements laid down above and contained within the UNEG Ethical Guidelines for Evaluation. When this is not possible, I will report the situation to my supervisor, designated focal points or channels and will actively seek an appropriate response.

_____ _____ (Signature and Date)

ToR Annex F: Evaluation Audit Trail

The following is a template for the evaluation team to show how the received comments on the draft evaluation report have (or have not) been incorporated into the final evaluation report. This Audit Trail should be listed as an annex in the evaluation report but not attached to the report file.

To the comments received on *(date)* **from the evaluation of** *(project name)*

The following comments were provided to the draft evaluation report; they are referenced by institution/organization (do not include the commentator's name) and track change comment number ("#" column):

Institution/ Organization	#	Para No./ comment location	Comment/Feedback on the draft evaluation report	Evaluation team response and actions taken
			•	
			•	
			•	
			•	

TOR Annex G: UNDP Evaluation: complaints and dispute settlement and reporting wrongdoing process

Complaints and dispute settlement

Should you or a member of the evaluation team have material concerns about the implementation of an evaluation or finalisation of an evaluation report, you are freely able to raise your concerns with the management within UNDP. You may submit your concerns anonymously at any stage of the evaluation process, including after an evaluation's completion, though UNDP encourages prompt reporting to ensure issues can be addressed in a timely manner.

For example, you may decide to alert UNDP management if:

- You feel unduly pressured to change the findings, conclusions or/and recommendations of an evaluation you have been contracted to undertake
- Payment for the evaluation is being withheld until it is adjusted to accommodate the request of the evaluation commissioner (other than to address quality concerns in relation to the report)
- You have not been provided with information that you consider to be material to the evaluation report
- The scope or depth of the evaluation has been adversely affected because you have not been provided with adequate access to interview or make connections with stakeholders

Please raise any material concerns with the Deputy Director of the relevant Regional Bureau who will ensure a timely response, and act fairly to address your concerns and seek to settle any disputes.

Please also include the Independent Evaluation Office, in your correspondence (evaluation.office@undp.org).

Reporting wrongdoing

UNDP takes all reports of alleged wrongdoing seriously. In accordance with the UNDP Legal Framework for Addressing Non-Compliance with UN Standards of Conduct, the Office of Audit and Investigation (OAI) is the principal channel to receive allegations.

Anyone with information regarding fraud, waste, abuse or other wrongdoing against UNDP programmes or involving UNDP staff is strongly encouraged to report this information through the Investigations Hotline (+1-844-595-5206).

People reporting wrongdoing to the Investigations Hotline have the option to leave relevant contact information or to remain anonymous. However, allegations of workplace harassment and abuse of authority cannot be reported anonymously.

When reporting to the Investigations Hotline, people are encouraged to be as specific as possible, including the basic details of who, what, where, when and how any of these incidents occurred.

Specific information will allow OAI to properly investigate the alleged wrongdoing.

The investigations hotline, managed by an independent service provider on behalf of UNDP to protect confidentiality, can be directly accessed worldwide and free of charge in different ways: http://undp.ethicspoint.com/ (ONLINE REFERRAL FORM (You will be redirected to an independent third-party site.)

PHONE - REVERSED CHARGES Click here for worldwide numbers https://secure.ethicspoint.eu/domain/media/en/gui/104807/phone.html (interpreters available 24 hours/day) Call +1-844-595-5206 in the USA

EMAIL directly to OAI at: reportmisconduct@undp.org

REGULAR MAIL
Deputy Director (Investigations)
Office of Audit and Investigations
United Nations Development Programme
One UN Plaza, DC1, 4th Floor
New York, NY 10017 USA

ANNEX 3: EVALUATION QUESTIONNAIRE

1.	What has been your involvement with the Project?
2.	How relevant is the Project? What gap has it filled?
3.	What have been, in your opinion, the major achievements obtained by the Project? How effective have these been? Have these been achieved efficiently?
4.	What have been the main problems or challenges, in your opinion, with the Project?
5.	How does the project link and/or interconnect with other initiatives, if any?
6.	How has gender and the leave no one behind agenda been incorporated in the different phases of the project?
7.	What other cross-cutting issues did the project incorporate (SDGs, developmental, health and air pollution)?
8.	What mechanisms are in place, or will be in place, to assure sustainability? That is, how can or how will the results be maintained in time?
9.	Does the Project leave any lessons learned? That is, knowing what you know now what you would recommend that it would have been done differently?
10.	Based on the achievements and/or challenges of Phase I, what can be recommended for Phase II? Further possible phases (i.e. a third phase)?
11.	Any other comments or issues you would like to add, please do so.

ANNEX 4: EVALUATION MATRIX

Evaluation criteria	Key Questions	Specific Sub-Questions	Data Sources	Data collection Methods / Tools	Indicators/ Success Standard	Methods for Data Analysis
Relevance/ Coherence	How relevant is the project regarding national policies, and UN / UNDP corporate mandates? To what extent the objectives of this intervention are consistent with the needs and interest of the people, the needs of the country, national strategies, and relevant legislation and policies?	To what extent was the project in line with national development priorities, country programme outputs and outcomes, the UNDP Strategic Plans (current at time of design of each of the two phases of the project), and the SDGs? To what extent does the project contribute to the theory of change for the relevant country and regional programme outcomes? To what extent were perspectives of men and women who could affect the outcomes, and those who could contribute information or other resources to the attainment of stated results, considered during project design processes? To what extent has the project been appropriately responsive to political, legal, economic, institutional, etc., changes in the countries? What partnerships and coherence have there been within both phases of the project (intra UN -UNEP for example-, for example with other agencies, and with implementing partners, in academia for instance)?	Project planning documents Corporate documents Documentation on national relevance regarding national development priorities/strategies/policies	Desk review of documents	Coherence of priorities and needs Alignment with national and regional Asian development priorities and with UN, and UNDP corporate mandates	Document analysis

Relevant evaluation criteria	Key Questions	Specific Sub-Questions	Data Sources	Data collection Methods / Tools	Indicators/ Success Standard	Methods for Data Analysis
Effectiveness	To what extent have the expected outcomes and objectives of the project been achieved or are likely to be achieved.?	To what extent has the project achieved the objectives and targets of the results framework in planning documents? Including analysis of (i) planned activities and results and (ii) achievement of results. To what extent did the project contribute to the country and regional programme outcomes and outputs, the SDGs, the UNDP Strategic Plan, and national development priorities? What factors have contributed to achieving, or not, intended country/regional programme outputs and outcomes? What factors contributed to effectiveness or ineffectiveness? How might this be improved in the future? In which areas does the project have the greatest achievements? Why and what have been the supporting factors? How can the project build on or expand these achievements? In which areas does the project have the fewest	Monitoring reports Stakeholders	Desk review of documents Key informant interviews and/or focus group discussion	Key achievements Hindering factors for achievements Factors aiding achievements. Assessment by key project stakeholders	Document analysis Quantitative analysis by using logical framework and related indicators as benchmarks to tally project progress in implementation. Qualitative analysis applied to the information harnessed by interviews using thematic analysis of responses Validation and triangulation

		achievements? What have been the constraining factors and why? How can or could they be overcome? What, if any, alternative strategies would have been more effective in achieving the project objectives? Are the project objectives and outputs clear, practical and feasible within its frame? Do they clearly address women, men and vulnerable groups? To what extent have different stakeholders been involved in project implementation? Have any good practices, success stories lessons learned, or transferable examples been identified, describing them and/or documenting them as possible?				

Relevant evaluation criteria	Key Questions	Specific Sub-Questions	Data Sources	Data collection Methods / Tools	Indicators/ Success Standard	Methods for Data Analysis
Efficiency	To what extent resources/inputs (funds, time, human resources, etc.) have been turned into results and the results have been delivered with the least costly way possible?	To what extent was the project management structure as outlined in the project document efficient in generating the expected results? To what extent has the UNDP project implementation strategy and execution been efficient and cost-effective? To what extent has there been an economical use of financial and human resources? Have resources (funds, male and female staff, time, expertise, etc.) been allocated strategically to achieve outcomes? To what extent were outputs delivered in a timely manner and with high quality? To what extent has the project ensured value for money? To what extent have resources been used efficiently? Have activities supporting the strategy been cost-effective?	Project Planning Documents Monitoring Reports Financial Reporting Auditing reports Stakeholders	Desk review of documents Key informant interviews and/or focus group discussions	Document content where governance structure reporting, minutes of meetings, etc. Content in donor reporting documents Quantitative analysis of expenditures Adaptive management Key stakeholder assessments Documented changes effected in the concept notes work plans/ management arrangements in response to challenges, if any	Document analysis Quantitative analysis by using logical framework and related indicators as benchmarks to tally project progress in implementation. Qualitative analysis applied to the information harnessed by interviews using thematic analysis of responses Validation and triangulation

		To what extent have project funds and activities been delivered in a timely manner? To what extent was there any identified synergy between UNDP initiatives/projects that contributed to reducing costs while supporting results? What have been the contributing and what have been the hindering factors in achieving or not achieving results efficiently?				

Relevant evaluation criteria	Key Questions	Specific Sub-Questions	Data Sources	Data collection Methods / Tools	Indicators/ Success Standard	Methods for Data Analysis
Sustainability	What are the prospects of sustainability? What can be recommended and what are lessons learned to enhance sustainability?	To what extent will target men, women and vulnerable people benefit from the project interventions in the long-term? Are there any social or political risks that may jeopardize sustainability of project outputs and the project contributions to country programme outputs and outcomes? Do the legal frameworks, policies and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits? To what extent are lessons learned documented by the project team on a continual basis and shared with appropriate parties who could learn from the project? To what extent does this UNDP intervention have well-designed and well-planned exit strategies which include a gender dimension?	Stakeholders Documents	Interviews Document analysis	N/A	Thematic analysis of interviews

		What could be done to strengthen exit strategies and sustainability to support female and male project beneficiaries as well as marginalized groups? What are after-Project possible priority interventions and general recommendations, which could further ensure sustainability of Project's achievements? How can lessons learned from CABSA I be applied to CABSA II (and in further programming if needed)? What could be possible after-Project priority interventions and general recommendations related to policy influencing, which could further ensure sustainability and scaling up of Project's achievements? What general recommendations can be made, supporting the positive aspects of this project, or attempting to correct course, in further programming and future projects? Have there been any lessons learned from design and implementation?				

Relevant evaluation criteria	Key Questions	Specific Sub-Questions	Data Sources	Data collection Methods / Tools	Indicators/ Success Standard	Methods for Data Analysis
Cross-cutting issues	What have been the cross-cutting issues in the Project and how have been incorporated in design, implementation, monitoring, etc., --as relevant these will be included as underlying analysis of the different criteria above--?	Human rights: To what extent have poor, indigenous and physically challenged, women, men and other disadvantaged and marginalized groups benefited from the work of UNDP in the country? Gender equality: To what extent have gender equality and the empowerment of women been addressed in the design, implementation and monitoring of the project? To what extent has the project promoted positive changes in gender equality and the empowerment of women? Did any unintended effects emerge for women, men or vulnerable groups? Disability: Were persons with disabilities consulted and meaningfully involved in programme planning and implementation? Were there any unintended (positive and/or negative) effects? Are the gender markers assigned to this project	Stakeholders Documents	Key informant Interviews and/or group discussions Document analysis	Coherence of gender marker (GEN1) determined in design phase and what the project was trying to achieve, Phase I Coherence of gender marker GEN2 determined in design phase and what the project is trying to achieve, Phase II Aspect(s) of the output at the project level promoting gender equality. Rights approach specifically incorporated in design, results (for	Document reviews of content vis-à-vis cross cutting issues. Thematic analysis of interviews

		(GEN1 and GEN2) representative of reality? What is the reasoning for the assigned gender markers?			instance, right to health, leave no one behind).	
Recommendations, lessons learned	What can be recommended for CABSA II and/or future programming (i.e. CABSA III) based on analysis of CABSA I achievements?	What are after-Project possible priority interventions and general recommendations, which could further ensure sustainability of Project's achievements? How can lessons learned from CABSA I be applied to CABSA II (and in further programming if needed)? What could be possible after-Project priority interventions and general recommendations related to policy influencing, which could further ensure sustainability and scaling up of Project's achievements? What general recommendations can be made, supporting the positive aspects of this project, or attempting to correct course, in further programming and future projects? Have there been any lessons learned from design and implementation?	Stakeholders Documents	Interviews Document analysis	N/A	Thematic analysis of interviews

ANNEX 5: LIST OF STAKEHOLDERS EVALUATION ENGAGED WITH

No	Country	Name	Organization	Department	Gender
1	Republic of Korea	Heekwan Lee	Incheon National University	Department of environmental engineering	Male
2	Republic of Korea	Jiye Yoo	Incheon National University	Institute for Environmental Convergence Technology	Female
3	Republic of Korea	Yongchan Lee	Incheon National University	Department of environmental engineering	Male
4	Republic of Korea	Injo Hwang	Daegu University	Department of environmental engineering	Male
5	Republic of Korea	Daekeun Kim	Seoul National University of Science and Technology	Department of environmental engineering	Male
6	Republic of Korea	Sungtae Kim	E2M3	Environmental research division	Male
7	Republic of Korea	Jinsik Cho	E2M3	Environmental research division	Male
8	Cambodia	Yim Raksmey	Ministry of Environment	Department of Air Quality, Noise, and Vibration Management	Male
9	UNDP	Sirintharat Wannawong	Environment team	UNDP Bangkok Regional Hub	Female
10	Republic of Korea	Youngwoo Kim	Ministry of Environment		Male
11	Thailand	Ittiphol Pawarmart	Ministry of Natural Resources and Environment, Thailand	Pollution Control Department	Male

ANNEX 6: RESULTS FRAMEWORK FOR CABSA I

Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework:
Outcome 1: Inclusive and sustainable structural transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions

Outcome indicators as stated in the Regional Programme Results and Resources Framework:
1.3. Number of Asia-Pacific cities in most polluted 100 cities in the world

Applicable Outcome(s) from the UNDP Strategic Plan:
SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions

Project title: Clean Air for Blue Sky Asia (Phase I)

Expected Outputs	Output Indicators	Data Source	Baseline		Targets			Data Collection Methods and Risks
			Value	Year	2022	2023	2024	
Output 1: Air quality information gap is addressed in targeted countries (Thailand, Laos PDR, and Cambodia), through a prototype AAQMaP	1.1 % of data sets collected from various observations and sources needed to AAQMaPs	Data generation to harmonize modeling input	0	2021	60	80	90	Surveys Monitoring
	1.2 A comprehensive assessment completed to identify air quality information gap in targeted countries	Project Monitoring Reports	N/A	2021	YES	YES	YES	Project Monitoring Reports
	1.3 % increase in monthly users/visitors of a prototype Air Quality Platform (Baseline is the no. of users at the launch of the AAQMaP, assuming Q3 of 2023)	System generated data	0%	Q3-2022	20%	40%	60%	System generated data
Output 2: National Counterparts in targeted countries have the capacity to address air pollution challenges by utilizing integrated science-based air quality models	2.1 Number of generating scenarios and analysis for air quality modeling by country technology and data analysis	System generated scenario and reports	0	2022	0	15	30	System generated scenario and reports
	2.2 Number of people participated in training courses on air quality modeling technology and data analysis disaggregated by gender	Project Monitoring Reports	0	2022	0	M20 F10	M40 F20	Monitoring Reporting

Output 3: Existing initiatives to address air pollution management and policy measures are scaled-up and catalysed	3.1 Number of identified scalable initiatives to address air pollution management and policy measures	Project Monitoring Reports Independent Evaluation	0	2022	0	1	3	Assessment Feedback from partners and beneficiaries

ANNEX 7: RESULTS FRAMEWORK FOR CABSA II

Intended Outcome as stated in the Global/Regional Programme Results and Resource Framework:
Outcome 1: Inclusive and sustainable structural transformations accelerated to reduce poverty, inequality, and vulnerabilities towards the achievement of SDGs and inclusive, sustainable, resilient and digital transitions

Outcome indicators as stated in the Regional Programme Results and Resources Framework:
1.3. Number of Asia-Pacific cities in most polluted 100 cities in the world

Links to Regional Programme Outputs (2022-2025):
RPD Output 1.4: Sustainable, scalable and innovative solutions and strategies for Nature, Climate and Energy transformation strengthened through enhanced Climate Promise, nature-based solutions, and transitioning to clean energy and zero-carbon development.
RPD indicator 1.4.4 Number of countries participating in transboundary and regional strategic cooperation for sustainable natural resources management.
Baseline (2022): 3 Target (2026): 6

Applicable Outcome(s) from the UNDP Strategic Plan:
SP Outcome 1: Structural transformation accelerated, particularly green, inclusive, and digital transitions

Project title: Clean Air for Blue Sky Asia (Phase II)

Expected Outputs	Output Indicators	Data Source	Baseline		Targets			Data Collection Methods and Risks
			Value	Year	2024	2025	2026	
Output 1: Air quality information gap is addressed in targeted countries (Indonesia, Mongolia, and Vietnam, through AAQMaP	1.1 % of data sets collected from various observations and sources needed to AAQMaP	Data generation to harmonize modeling input	0	2022	60	80	90	Surveys Monitoring
	1.2 A comprehensive assessment completed to identify air quality information gap in targeted countries	Project Monitoring Reports	N/A	2022	YES	YES	YES	Project Monitoring Reports
	1.3 % increase in monthly users/visitors of Air Quality Platform (Baseline is the no. of users at the launch of the AAQMaP)	System generated data	0%	2022	20%	40%	60%	System generated data
Output 2: National Counterparts in targeted countries have the capacity to	2.1 Number of generating scenarios and analysis for air quality modeling by country technology and data analysis	System generated scenario and reports	0	2022	0	15	30	System generated scenario and reports

address air pollution challenges by utilizing integrated science-based air quality models								
	2.2 Number of people participated in training courses on air quality modeling technology and data analysis disaggregated by gender (50% are women)	Project Monitoring Reports	0	2022	0	M 15 F 15	M 30 F30	Monitoring Reporting
	2.3 Number of scenarios are considered to address gender challenges in air quality modeling	Project Monitoring Reports	0	2022	0	5	10	System generated scenario and reports
Output 3: Existing gender-responsive initiatives to address air pollution management and policy measures are scaled-up and catalysed	3.1 Number of identified gender responsive scalable initiatives to address air pollution management and policy measures	Project Monitoring Reports Independent Evaluation	0	2022	0	1	3	Assessment Feedback from partners and beneficiaries
	3.2 Extent to use of results as an advocacy tool to promote gender equality/women's participation in air pollution reduction policies/recommendation	Project Monitoring Report	1 (none)	2022	2 (very partial)	3 (partial)	4 (large)	Assessment And/or feedback from partners and beneficiaries;

ANNEX 8: LIST OF SUPPORTING DOCUMENTS REVIEWED

Project Documents Consulted:

- 2022 CDR CABSA I
- 2023 CDR ROK CABSA I
- Amendment to contract to INU to develop AAQMAP
- Annual Report CABSA I 2022
- Annual report CABSA I 2023
- Bi-annual report CABSA I 2023
- CABSA list of participating researchers
- Contract to INU to develop AAQMAP
- INU contract Inception report
- NIER Presentation CABSA UNDP
- Quarterly Progress Report CABSA I 2023Q1
- Quarterly Progress Report CABSA I 2023Q2
- Quarterly Progress Report CABSA I 2023Q3
- Quarterly Progress Report CABSA I 2023Q4
- Quarterly Progress Report CABSA I 2024Q1
- Signed engagement facility concept note CABSA I
- Signed engagement facility concept note CABSA II
- Signed Grant Agreement CABSA I
- Signed Grant Agreement CABSA II
- Signed Statement of Intent CABSA I
- TOR for CABSA I and II project evaluation
- TOR service provider to develop AAQMAP
- TOR_IC data collection and analysis ROK CABSA II
- Webinar CABSA (UNDP)

Reference documents consulted:

- Guangcong Liu, Baijun Sun, Lianzheng Yu, Jianping Chen, Bing Han, Yizhuo Li and Jie Chen. The Gender-Based Differences in Vulnerability to Ambient Air Pollution and Cerebrovascular Disease Mortality: Evidence Based on 26781 Deaths. Global Heart 2020.

- OECD (2023), *Glossary of Key Terms in Evaluation and Results-Based Management for Sustainable Development (Second Edition),* OECD Publishing, Paris, https://doi.org/10.1787/632da462-en-fr-es

- UNDP Independent Evaluation Office. UNDP Evaluation Guidelines (Revised edition June 2021).

- UNDP. Independent Evaluator Induction Package. 2024.

ANNEX 9: OVERALL IMPLEMENTATION PROGRESS AND SUMMARISED FINDINGS OF THE PROJECT

This section was produced by the Incheon National University as a summary of activities carried out and with summarised findings of project level research

• Task	• Description
• Workshops	• AAQMaP session at "the 2022 Environmental Industry & Carbon Neutrality Conference" - Songdo, South Korea (September 30, 2022) • Inception workshop - Online (December 9, 2022) • Bangkok workshop - Bangkok, Thailand (January 31.-February 1, 2023) • 2023 CABSA Mid-term review meeting (July 4, 2023) • Bangkok workshop - Bangkok, Thailand (January 11-12, 2024) • Scenario workshop - Online (June 20, 2024)
• Air quality monitoring	• Collecting air quality monitoring data through local partners • - Thailand partners: Chulalongkorn University, Bangkok Metropolitan Administration (BMA), Pollution Control Department (PCD) • Target Substances: CO, SO2, NOx, O3, PM10, PM2.5 • - Cambodia Partner: Ministry of Environment • Target Substance: PM10, PM2.5 • - Lao PDR Partner: Ministry of Natural resources and Environment • Target Substance: PM2.5 • Literature survey and data review

• Air emission inventory	• Collect air quality inventory data through local partners • Literature survey and data review • Analyse Emissions Database for Global Atmospheric Research (EDGAR) data
• Satellite data	• Analyse the Satellite Data User Interface • Potential limitations of satellite data for air quality monitoring • Review potential limitations of satellite data for air quality monitoring • Analyse air quality using NASA's Landsat-8 data for GEMS analysis • Collect and analyse GEMS data • Use of GEMS Data for Air Quality Analysis in Thailand, Cambodia, and Lao PDR • Use GEMS data to conduct a comprehensive air quality analysis in the regions of Thailand, Cambodia, and Lao PDR. This analysis shall include assessment of pollutant levels, and evaluation of spatial and temporal variations in air quality parameters.
• Air Quality Modeling	• Source air emission source data • Setting Up a Modeling Area Grid • Air emission inventory is used to generate modeling input emissions through species classification, temporal distribution, and spatial distribution • Conducted air quality modeling using WRF-SMOKE-CMAQ for Thailand, Cambodia, and Laos from December 2020 to January 2022. • PM2.5 modelling by country by mitigation scenario
• Policy intervention scenario	• Analysing national air quality policies • Derive air quality mitigation scenarios • Scenario emission estimation and analysis using LEAP
• Policy analysis	• Analysing South Korea's Air Management Policy • Analyse successful policy advocacy cases

THAILAND

Thailand has established a robust air quality monitoring network, with the Bangkok Metropolitan Administration (BMA) operating a total of 82 monitoring stations throughout Bangkok. These stations are strategically divided between 44 roadside locations and 38 ambient air monitoring sites. While all stations monitor PM2.5 levels, the Ratchathewi station stands out for its comprehensive monitoring capabilities, measuring multiple pollutants including PM10, PM2.5, CO, NO_2, and ozone. Since 2021, the public has had access to hourly particulate matter data through the website (https://bangkokairquality.com/bma/index.php).Beyond Bangkok, the Pollution Control Department (PCD) maintains a broader national network of 77 monitoring sites across 46 provinces, ensuring widespread coverage of air quality monitoring throughout Thailand.

Analysis of Thailand's emission trends from 2009 to 2018, based on EDGAR data, reveals interesting patterns in various pollutants. While CO emissions showed an overall declining trend after peaking in 2012 (with a slight increase in 2017), other pollutants including NH_3, NO_x, PM10, PM2.5, and SO_2 maintained relatively stable levels during this period. Notably, PM2.5 demonstrated the most consistent levels among these pollutants.

Recent satellite data from the Geostationary Environment Monitoring Spectrometer (GEMS), collected between November 2022 and October 2023, provides valuable insights into seasonal aerosol patterns. The analysis reveals pronounced increases in aerosol optical depth (AOD) during March and April, primarily attributed to agricultural biomass burning activities in central and northern Thailand. The data also shows elevated tropospheric NO_2 concentrations in major urban centres, particularly Bangkok and Chiang Mai, likely resulting from vehicle emissions and industrial activities. SO_2 levels remained generally low across the region, with minor elevations observed in industrial areas of Bangkok and Chiang Mai.

Air quality modeling efforts using the WRF-SMOKE-CMAQ system covered a comprehensive period from December 2020 to January 2022. The modeling domain, set at a 27 km grid resolution, encompassed Thailand, Cambodia, and Laos, utilizing emissions data from REAS v3 and national inventories. While the model successfully captured PM2.5 patterns in certain northern and southern locations, it showed limitations in accurately predicting concentrations at other monitoring stations. This suggests that while the current modeling system effectively represents urban pollution patterns, further refinements are needed to better capture air quality dynamics in rural areas and regions with complex emission sources.

Looking ahead to 2030, baseline projections suggest concerning trends in emissions growth. Transportation sector expansion is expected to drive a significant 64.98% increase in NO_x emissions. Similarly, particulate matter emissions are projected to rise substantially, with PM10 and PM2.5 expected to increase by 22.92% and 46.01% respectively. These projections highlight the need for additional intervention measures to prevent deterioration in air quality.

CAMBODIA

The ministry of Environment has collaborated with several countries regarding air quality. However, it is significant collaborated with Chinese Government recently. Some equipment or stations are donated by Chinese Government for monitoring the air quality in Cambodia. Recently, Cambodia Government will receive the 10 air monitoring stations which will be set up few in Phnom Penh city and others for the provinces. Usually, Ministry of Environment play an important role for air monitoring/ quality in Cambodia. The data are sent from all stations in the country to analyse and publish at the Ministry.

The air quality monitoring stations in Cambodia are located in urban and suburban areas to capture the air pollution level in areas where population density is high and where industries and transportation activities are prevalent. Air quality monitoring stations located in 10 provinces (44 monitoring equipment) in Cambodia, including Phnom Penh, Kandal, Kampong Cham, Battambang, Siem Reap, Kampong Speu, Prey Veng, Svay Rieng, Kampot, and Rattanakiri.

Analysis of Cambodia's emission trends from 2009 to 2018, based on EDGAR data, reveals distinct patterns across various pollutants. CO emissions have shown a steady increase throughout this period, while other pollutants including NH_3, NO_x, PM10, PM2.5, and SO_2 have maintained relatively stable levels. However, both SO_2 and NO_x demonstrated slight increases after 2012, indicating evolving patterns in industrial and urban emissions.

Recent satellite data from the GEMS provides valuable insights into the country's air quality patterns. The analysis reveals a clear seasonal cycle in aerosol concentrations, with notable increases during the dry season, particularly in March and April. Unlike neighboring Thailand, Cambodia does not exhibit specific NO_2 hotspots, which can be attributed to its limited industrial and vehicular emission sources. The tropospheric NO_2 values for Cambodia consistently remain low compared to Thailand. However, SO_2 levels show some elevation in eastern Cambodia during the dry season, likely resulting from long-range atmospheric transport rather than local sources.

Air quality modeling efforts using the WRF-SMOKE-CMAQ system, conducted from December 2020 to January 2022, offer additional insights into regional air quality dynamics. The modeling results indicate that PM2.5 levels in Cambodia are generally lower than those observed in Thailand and Laos, a finding that aligns with data from monitoring stations. However, the model shows a slight underestimation of observed PM2.5 concentrations, suggesting that local emissions and transboundary pollution may not be fully captured in the current emissions inventory data.

Looking ahead to 2030, baseline scenario projections paint a concerning picture of potential air quality deterioration. The analysis forecasts substantial increases across various pollutants, with NO_x emissions expected to rise by 141.01%, NMVOC by 136.37%, and CO by 78.26%. Particulate matter emissions are also projected to increase significantly, with PM10 rising by 47.84% and PM2.5 by 61.31%. These projections suggest a potentially significant deterioration in air quality if current trends continue without intervention.

LAO PDR

Air quality monitoring in Lao PDR is primarily managed by the Natural Resources and Environment Research Institute (NRERI), operating under the Ministry of Natural Resources and Environment (MoNRE). The institute maintains a network of 11 monitoring stations strategically distributed across six provinces, including the capital city of Vientiane. These stations are equipped to monitor various air pollutants, including PM2.5, O_2, SO_2, and O_3, providing essential data for understanding both urban and suburban air quality conditions throughout the country.

Analysis of emission trends in Lao PDR from 2009 to 2018, based on EDGAR data, reveals interesting patterns in pollutant concentrations. CO emissions showed a consistent increase until 2016, followed by a slight decline, though levels remained notably higher than those recorded in 2009. Other monitored pollutants demonstrated similar trajectories, with most showing signs of stabilization or minor decreases after 2016, suggesting a potential shift in emission patterns during this period.

Satellite data analysis using the GEMS has provided valuable insights into regional air quality patterns. The GEMS Aerosol Optical Depth AOD data indicates significant increases in aerosol concentrations during the dry season, primarily attributed to biomass burning activities. Northern regions of Lao PDR exhibit elevated NO_2 levels, particularly during the dry season, although these concentrations remain lower than those observed in neighboring Thailand. Additionally, the data shows elevated tropospheric SO_2 levels across eastern Lao PDR during the dry season, likely influenced by regional atmospheric transport patterns.

The implementation of air quality modeling using the WRF-SMOKE-CMAQ system from December 2020 to January 2022 has revealed important insights about pollution patterns in Lao PDR. The modeling results indicate an underestimation of PM2.5 concentrations compared to actual monitoring station data, particularly in northern regions. This discrepancy suggests that current emissions inventories may not fully capture all local pollution sources, such as biomass burning and industrial activities. Overall, PM2.5 concentrations in Lao PDR demonstrate moderate levels with notable seasonal variations, particularly influenced by increased emissions during the dry season.

Looking ahead to 2030, baseline scenario projections indicate significant potential increases in various pollutant emissions. Carbon monoxide is expected to rise by 78.26%, while NMVOC and NO_x show more dramatic projected increases of 136.37% and 141.01%, respectively. Particulate matter concentrations are also expected to rise substantially, with PM10 projected to increase by 47.84% and PM2.5 by 61.31%. These projections suggest a potentially significant intensification of particulate pollution issues in the coming years if current trends continue without intervention.