# Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)

Validation Report

The proposed ICR project "Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)" has been planned to be implemented by "Saudi Arabian Oil Co. (Saudi Aramco)" in the coastal regions of the Kingdom of Saudi Arabia, spanning over 9.9 ha within Dammam DRT, Kingdom of Saudi Arabia. The purpose of the project activity is to restore, and conserve mangrove habitat within project area through re-introduction of native mangrove ensuring the long-term recovery of mangroves and promote sustainable coastal management.

The scope of this validation is to have an independent third-party assessment of the ICR Project Design Description, the monitoring plan stated in the ICR PDD, and review of standard operating procedures of the project at the time of validation.

Based on the desk-review of the project documentation (refer to Appendix I) along with physical verification of project area, VVB confirms that on-ground conditions of project region is following the description provided in the ICR PDD and supplementary documentation. Through plantation of mangrove species i.e., *Avicennia marina* ICR project expects to generate a total of 4,357 $tCO_2e$ over the crediting period of 30 years, starting from 16/04/2028 to 15/04/2058 with an annual average ERRs of 145 tCO2e/year.

Carbon Check (India) Private Limited (CCIPL)

| | |
|---|---|
| **Title of project** | Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM) |
| **ID of project** | ICR-137 |
| **Date of project design document** | Latest PDD v2.2: 12/04/2024 |
| **Version of project design document** | 2.2 |
| **Statement by the project proponent** | The Project Proponent states that he is responsible for preparing and fair presentation of the Project Design Description and all accompanying documentation provided for under the validation. |

| | |
|---|---|
| **Title of report** | Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM) |
| **ID of report** | CCIPL2100/ICR/VAL/SWAM/20231228 |
| **Client (Project proponent)** | Saudi Arabian Oil Co. (Saudi Aramco) |
| **Criteria for validation** | ☐ ICR requirement document v.4<br>☒ ICR requirement document v.5<br>☒ ISO 14064-2<br>☒ Applied methodology, CDM Methodology AR- AM0014: Afforestation and reforestation of degraded mangrove habitats v3.0[1]<br>☐ Other, please specify. |
| **Date of validation** | 03/01/2024 to 20/04/2024 (Date of on-site inspection to FVR Preparation) |
| **Version number of this validation report** | 2.1 |
| **Date of version** | 20/04/2024 |
| **Prepared by** | Carbon Check (India) Private Limited (CCIPL) |
| **Contact** | **Address:** Registered Office: 2071/38, 2nd Floor, Nawala, Karol Bagh, New Delhi - 110005<br>Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector 32 Noida, Uttar Pradesh – 201301, India<br>**Telephone:** +911204373114<br>**Email:** info@carboncheck.co.in<br>**URL:** www.carboncheck.co.in |
| **Independent review** | Amit Anand (Technical Reviewer) |
| **Validation team leader** | Vijay Mathew |

[1] 8AE9TYMDSZJP762KF3CL0NWR5HBIUV (unfccc.int)

| | |
|---|---|
| **Validation statement** | Carbon Check (India) Private Limited (CCIPL) states that Carbon Check (India) Private Limited (CCIPL) is responsible for the opinion based on the validation of the proposed project.<br>CCIPL has been commissioned by the YADGREEN Agriculture Co (Project Listing Representative) to perform validation of ICR Project Activity "Dammam DR Sustainable Wetlands and Mangrove Conservation (DD-SWAM)".<br><br>Based on the on-site inspection, the review of the ICR Project Design Description (PDD v2.2 dated 12/04/2024), and supporting documents, the CCIPL team confirms that the project PDD has been developed taking appropriate assumptions and values in compliance with the requirements of ICR Requirements version 5.0, ISO 14064-2 and the methodology applied AR- AM0014 v3.0.<br>The monitoring plan in the PDD adequately addresses ex-ante monitoring procedures of the project's GHG removals. The GHG carbon calculations have been calculated appropriately based on the applied methodology. The total estimated GHG removals from the project activity is 4,357 $tCO_2e$, with an average annual GHG removals of approximately 145 $tCO_2e$/ year over the crediting period of 30 years from 16/04/2028 to 15/04/2058 |
| **Signature** |  |

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# 1. Summary

Saudi Arabian Oil Co. (Saudi Aramco) has appointed Carbon Check (India) Private Limited (hereafter referred to as "CCIPL" or "VVB") to carry out the validation of the project "Dammam DR Sustainable Wetlands and Mangrove Conservation (DD-SWAM)" with respect to the relevant requirements of ICR Requirements Version 5.0 (dated 09/10/2023) and ISO14064-2 Second Edition 04/2019.

The proposed project is planned to be implemented under ICR sectoral scope 14: Afforestation and Reforestation. As per the ICR PDD[/01/], the purpose of the project is restoration and conservation of mangrove ecosystem within the Dammam DRT region near to the Ras Tanura Eco Park (Saudi Arabia). Encompassing an area of 9.9 hectares, allocated for restoration efforts planned for upcoming years of the project[/01//4.6/].

As per the ICR PDD[/01/]and ex-ante carbon calculation sheet[/03/] the total estimated GHG emission removals generated from the project activity are 4,357 $tCO_2e$ over the crediting period of 30 years (starting from 16/04/2028 to 15/04/2058) with an annual average of 145 $tCO_2e$.

The ICR project has selected the CDM approved methodology AR-AM0014: "Afforestation and reforestation of degraded mangrove habitats v3.0[/B02/2] to quantify GHG emission removals achieved from project activities. VVB, confirms that the methodological approach identified by the proposed project is recognized and approved for the use in carbon offset projects by respective standards following the ISO-14064 guidelines.

As per ICR PDD[/01/], and further confirmed during onsite inspection/interviews[/4.6//4.7/], following steps have been planned to ensure successful implementation of the project activity:

| Activity | Benefit to Mangroves | Contribution to Carbon Emission Reduction |
|---|---|---|
| **Water Quality Monitoring** | Ensures optimal conditions for growth and health. | Healthy mangroves sequester more carbon. |
| **Sediment Quality Assessment** | Supports robust root systems and sediment stability. | Stable mangroves store carbon efficiently in soil. |
| **Ecological Parameters Monitoring** | Helps in biodiversity and health assessment. | Diverse ecosystems have higher carbon uptake. |
| **Enhancing Water Flow** | Improves nutrient distribution and root health. | Healthy roots store more carbon in the soil. |

**Purpose and scope of validation**

The purpose of the validation is the independent evaluation of the project's compliance with the ICR Requirements v5.0, the project's baseline, monitoring plan, project implementation, carbon sequestered by the project, methodology requirements, ISO 14064-2 requirements, compliance with the relevant ICR and host party criteria.

Validation scope is defined as an independent and objective review of the ICR Project Design Description (PDD) against the relevant criteria and guidance documents provided by ICR including the following[/02/]:

- ICR Requirement Document (v5.0, dated 09/10/2023)
- IS0 14064-2 2019 (Second edition 04/2019)
- ICR Definitions (v2.0, dated 09/10/2023)
- ICR Process Requirements (v5.0, dated 06/02/2024)
- ISO 14064-2 (Dated April 2019)
- ISO 14064-3 (Dated April 2019)

[2] 8AE9TYMDSZJP762KF3CL0NWR5HBIUV (unfccc.int)

- ISO 14065 (Dated December 2020) (v4.3, Dated 22/04/2022)
- Non-Permanence Risk Analysis per ISO 31000 and Relevant Good Practice Guidance risk assessment tool
- CDM Methodology, AR-AM0014: "Afforestation and reforestation of degraded mangrove habitats v3.0.

**Method and Criteria for validation**

To conduct the validation audit, CCIPL has conducted an assessment including a desk review of the ICR Project Design Description (PDD)/01/, monitoring plan & SOPS/01/ and supporting documents/02-09/ in compliance with the requirements stated in the ICR requirements document v5.0, ISO 14064-2, 14064-3 and in ISO 14065/B01/. Thereafter, verification of the details and information from the ICR PDD/01/ has been accomplished during onsite inspection conducted on 24/01/2024 including interviews with the representatives of project proponent and MRV personnel involved in project monitoring along with physical verification of the planting site to evaluate on-ground execution of project activities. This has been followed by resolution of desk-review and onsite inspection findings issued by CCIPL team and issuance of the final validation report and opinion.

**Number of findings raised during validation** /Appendix III/

During the validation, a total of 33 findings have been raised, which includes 08 Corrective Action Requests (CARs), 24 Clarification Requests (CLs) and 00 Forward Action Request (FAR). Upon receipt of the requested evidential documentation and clarifications/information, all findings have been resolved satisfactorily.

**Uncertainties associated with the validation.**

Based on the review of the ICR PDD/01/ and physical verification of the project site, VVB confirms that there are no uncertainties associated with the estimation of biomass stock (including soil and trees) within the project boundary. VVB confirms that the project documentation has been developed taking appropriate assumptions and values in compliance with the requirements of ICR Requirements version 4.0/B01/ and the methodology applied AR-AM0014/B02/.

**Validation conclusion**

Based on review of the ICR PDD /01/, on-site inspection/4.6//4.7/, and supporting documents/02-09/, the CCIPL team has assessed the appropriateness of the project, assumptions, and values in compliance with the requirements of ICR v5.0, ISO 14064-2, ISO 14064-3, and ISO 14065 /B01/ and the methodology applied/B02/. Validation team confirms that the project has been implemented in line with the ICR requirements/B01/, methodology requirements/B02/ and monitoring plan stated in the ICR PDD/01/.

In accordance with the ICR requirement v5.0, ISO 14064-2, 14064-3, and ISO 14065/B01/ and the methodology applied AR-AM0014 v3.0"/B02/, the validation and verification team by reviewing supporting documents, has confirmed that all the values and assumption included in the ICR PDD/01/ including objectives, scope and criteria, level of assurance, baseline and monitoring plan are valid and applicable.

VVB confirms that the project implementation planning and the calculation for carbon removals achieved by the project are in accordance with:

- ✓ Monitoring plan and other assumptions stated in the ICR PDD/01/
- ✓ Applied Methodology: "Afforestation and reforestation of degraded mangrove habitats v3.0/B02/".
- ✓ Host country regulations.

| Validation summary | |
|---|---|
| **Validation start and end date** | 03/01/2024 – 20/04/2024 |

| | |
|---|---|
| **Sectoral scope of project activities** | 14: Afforestation and Reforestation |
| **Project type** | CDR/ Single project activity |
| **Eligibility of the project to participate under the ICR program** | The proposed ICR project falls under the ICR sectoral scope 14 (A/R) due to its commitment of implementing afforestation and/or reforestation activities within project area.<br>The project aligns with ISO 14064-2:2019, focusing on the quantification, monitoring, and reporting of greenhouse gas (GHG) emission reductions or removal enhancements and has applied CDM approved methodology AR-AM0014 v3.0. |
| **Transfer eligibility from other GHG program** | Not Applicable |
| **PDD completeness** | Version 2.2<br>Dated: 12/04/2024<br>VVB confirms that the latest available version of project PDD/01/, has followed protocol filling requirements per ICR template instructions and complied with the ICR requirement v5.0/B01/. VVB confirms that the ICR PDD/01/, clearly demonstrates the project concept and pertaining information. |
| **Project ownership** | Saudi Arabian Oil Co. (Saudi Aramco) |
| **Start date** | 16/04/2028 |
| **Crediting period** | 16/04/2028 to 15/04/2058 |
| **Double counting issuance and claiming** | The project has not sought nor received another form of GHG-related environmental credits/01//4.6/. This has been confirmed by checking on other GHG program/registries (CDM/GS/GCC/Plan Vivo)/B03/ and has been verified by reviewing the declaration/08/ that the project and/or project participants is/are not seeking registration under other GHG program. |
| **Host country attestation** | Not Applicable |
| **Additional information and confidential information** | Not Applicable |

# 2. General

## 2.1 Objective

The purpose of this validation is to conduct a thorough and independent assessment of the ICR project "Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)" to determine whether the proposed project complies with the validation requirements set out in the section 2.3 of this report including their material accuracy and compliance of the ICR project with the applicable requirements of the International Carbon Registry (ICR)/B01/, associated guidelines, and the applied methodology, AR-AM0014 v3.0/B02/.

Table III: VVB has ascertained the following on the ICR project/01/:

| | |
|---|---|
| **Project Type** | Carbon Dioxide Removal (CDR) |
| **Applied Methodology** | AR-AM0014: Afforestation and reforestation of degraded mangrove habitats Version 3.0/B02/ |
| **Sectoral Scope Applicable** | 14: Afforestation and Reforestation |

The validation and verification objective of the project includes:

- ✓ Assessment of project's compliance with the ICR requirements v5.0/B01/, ISO 14064-2, ISO 14064-3, ISO 14065/B01/ and other relevant ICR requirements/B01/.
- ✓ Assessment of compliance with the applied CDM Methodology AR-AM0014: Afforestation and reforestation of degraded mangrove habitats Version 3.0 /B02/
- ✓ Assessment of project compliance with the relevant rules including host country legislation.
- ✓ Evaluation of monitoring plan and develop conclusions regarding the monitoring methodology and the collection archiving of data relevant to GHG emissions estimation and baseline emissions.
- ✓ Evaluation of the calculation of GHG removals, including appropriateness of source, sink, and reservoirs, the correctness and transparency of formula and factor used, assumptions related to estimating GHG removals, and uncertainties.
- ✓ To develop conclusions based on validation & verification criteria, submission of corrective action requests, clarification requests and forward action requests, as applicable.

## 2.2 Criteria

In line with ISO 14064-3 section 5.1.5/B01/, during validation of the ICR project, VVB has included the following for the assessment:

- ✓ Method used for the determination of scope and boundaries of the project activity.
- ✓ GHG sources, sinks and reservoirs (SSRs) subject to monitoring during the project activity.
- ✓ Quantification method
- ✓ Requirements for disclosure of public information

The validation assessment has been performed through a combination of document review and interviews with the relevant personnel as discussed in section 4.6 and 4.7 of this report. At all times, the project has been assessed for conformance against the criteria described in section 2.4 of this report. As discussed in Appendix III, findings have been issued to ensure that the project's conformance to all requirements/B01//B02/.

The validation of the project includes the following assessment activities:

- ✓ Contract review & signing.
- ✓ Appointment of team members based on competencies.
- ✓ Assessment Planning
- ✓ Desk review of ICR PDD/01/, carbon sequestration calculations (ex-ante) and other documents
- ✓ Interviews with the stakeholders and local stakeholder meeting(s) during the on-site inspection
- ✓ Reporting and recording of assessment.
- ✓ Findings and their closureAPPENDIX2: FINDING LOG

- ✓ Additional validation/verification activities
- ✓ Submission of final report

A project specific validation plan has been developed to guide the auditing process to ensure efficiency and effectiveness. The purpose of the validation plan is to present risk assessment for determining the nature and extent of validation procedures necessary, thus reducing the risk of auditing errors to a reasonable level. The validation of the ICR PDD/01/ has been conducted in compliance with the requirement documents as stated in Appendix I/B01//B02/.

## 2.3 Scope

**Scope of Validation:** In accordance with the ISO 14064-3 section 5.1.6, the scope of validation is to assess the conformance of the ICR PDD/01/ and other relevant supporting documents against the requirements of ICR, ISO 14064-2, 14064-3, ISO 14065/B01/, and applied methodology AR-AM0014 V3.0/B02/ and associated applicable tools, including the assessment of:

- ✓ Methodology applied for the ICR project and project's eligibility against the same.
- ✓ ICR project's implementation and baseline scenarios
- ✓ Project area
- ✓ Physical infrastructure, activities, technologies, and processes of the ICR project
- ✓ Project's physical boundaries
- ✓ GHG sources, sinks and/or reservoirs.
- ✓ Growth and yield models
- ✓ Stakeholder involvement including socio-economic impacts (on local stakeholders) Subject to project implementation.
- ✓ Environmental impacts
- ✓ Baseline and additionality justification and Baseline type applicable to the ICR project in line with applied methodology/B02/
- ✓ Monitoring plan and monitoring SOPs employed.
- ✓ Estimated GHG removals calculation.
- ✓ Permanence Risk Analysis and allocation of buffer % for calculation of final ICCs generated from the project activity.

## 2.4 Materiality thresholds

Qualitative materiality threshold: Qualitative and quantitative materiality refers to "errors", "omission" and "misrepresentation" that either individually or in the aggregate form affect the GHG assertion.

As per section 5.1.7 of ISO 14064-3:2019,
*"Qualitative materiality refers to intangible issues that affect the GHG statement. Examples include:*
*a) control issues that erode the validator's confidence in the reported data;*
*b) poorly managed documented information;*
*c)difficulty in locating requested information.*
*d)noncompliance with regulations indirectly related to GHG emissions, removals, or storage".*

VVB has conducted assessment of management system of documentation presented by PP, project compliance against the applied methodology requirements and applicable ICR criteria, and correctness of the information given in the ICR PDD/01/ in line with ICR and ISO 14064-2 requirements. Furthermore, VVB has assessed the project monitoring process to evaluate data collection/reporting procedure, consistency of the data records, risk analysis of the project particulars along with mitigation through:

- ✓ cross-checking data/documents sets,
- ✓ by evaluating competency of project personnel,
- ✓ cross-checking the monitoring SOPs in place,

✓ QA/QC procedure planned to be employed by PP.

Therefore, VVB confirms that the project description complies with the applicable ICR and ISO 14064-3 requirements.

**Quantitative materiality threshold:**
As per section 5.1.7 of ISO 14064-3,

"*Quantitative materiality refers to error in value in the GHG statement. Examples include misstatements, incomplete inventories, misclassified GHG emissions or misapplication of calculations*".

*"The project is a small-scale project activity achieving total GHG removals of <300,000 tons of $CO_2e$ per year; as such, a 5 per cent materiality threshold has been applied."*[3]

Table IV: Materiality threshold applicable to project:

| Applicable Threshold Level | Category |
|---|---|
| ☐ 0.5 % | The project is a large-scale CDM project activity achieving total emission reductions of >500,000 tons of CO2e per year; as such, a 0.5 per cent materiality threshold is applied. |
| ☐ 1% | The project is a large-scale CDM project activity achieving total emission reductions of 400,000 tons of CO2e per year; as such, a 1 per cent materiality threshold is applied. |
| ☐ 2% | The project is a large-scale CDM project activity achieving total emission reductions of <300,000 tons of CO2e per year; as such, 2 percent materiality thresholds is applied. |
| ☒ 5% | The project is a small-scale CDM project activity achieving total emission reductions of <300,000 tons of CO2e per year; as such, a 5 per cent materiality threshold is applied. |

The validation team has identified the materiality threshold applicable to the project, based on the estimated average annual GHG removals /01//02/ from the project i.e., 145 $tCO_2e$/year (which is <300,000 tons of $CO_2e$/year). Hence, VVB has determined that 5 % i.e., 7 $tCO_2e$/year, materiality threshold is applicable to the project activity.

## 2.5 Validation team

| Full Name | Role or Responsibility | Type of activity performed |
|---|---|---|
| **Vijay Mathew** | Team Leader | Desk review, Onsite inspection & Interviews Protocol filling, DVR/findings preparation, FVR |
| **Vikash Kumar Singh** | Team Member/ Technical Expert | Desk review, Onsite inspection & Interviews Protocol filling, DVR/findings preparation, FVR |
| **Shweta Semwal** | Team Member/ Technical Expert | Desk review, Protocol filling, DVR/findings preparation, FVR |
| **Amit Anand** | Technical Reviewer | Review of project documentation/ Technical Review |

## 2.6 Validation activities and techniques

The evidence gathering plan has been employed based on the result of VVB's risk assessment. It has been designed to lower the validation risk to an acceptable level. The evidence-gathering plan shall specify the type and extent of evidence-gathering activities and should not be communicated to the client or responsible party. During the on-site inspection, the validator has conducted evidence-gathering activities including:

| Validation | |
|---|---|
| Observation | ☒ |

[3] https://cdm.unfccc.int/Reference/Guidclarif/iss/iss_guid08.pdf

| | |
|---|---|
| Inquiry | ☒ |
| Analytical testing | ☒ |
| Confirmation | ☒ |
| Recalculation | ☒ |
| Examination | ☒ |
| Retracing | ☒ |
| Tracing | ☒ |
| Control testing | ☒ |
| Sampling | ☐ |
| Estimate testing | ☐ |
| Cross-checking | ☒ |
| Reconciliation | ☒ |

## 2.7 Documented information

In compliance to section 5.4.4 of ISO 14064-3, VVB has been maintained following records

| | |
|---|---|
| Engagement terms | ☒ |
| Validation plan | ☒ |
| Evidence-gathering plan | ☒ |
| Who performed the evidence-gathering activities and when they were performed | ☒ |
| Collected evidence | ☒ |
| Requests for clarification, material misstatements, and nonconformities arising from the validation and the conclusions reached | ☒ |
| Communication with the responsible party on material misstatements | ☒ |
| The conclusions reached and opinions by the validator | ☒ |
| The name of the independent reviewer, the date of review and comments of the reviewer | ☒ |

# 3. Project

## 3.1 Description of the project

The proposed ICR project titled "Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)" involves restoration of hydrological and soil conditions in degraded mangrove areas, along with the systematic planting of mangrove propagules, primarily *Avicennia marina*, with the objective of reintroducing native mangrove species in the designate region. These efforts aim to reduce mangrove die-off rates and foster the successful establishment of new mangrove seedling/plantings, ultimately contributing to the preservation of these vital coastal ecosystems /01/.

VVB, based on the review of the ICR project PDD/01/ and on-site inspection of the project site, confirms that the mangrove planting and management activities have been planned to be implemented in line with the with the applicability requirement of the applied methodology AR-AM0014, v3.0/B02/.

VVB has validated the start date for the project as 16/04/2028/01//4.6/ by conversing with the project participant responsible for project documentation. The PP explains the choice of commencing the project on April 16th, 2028, based on a comprehensive examination of planning and feasibility analysis. This selection is strategically aligned with preparatory activities and funding cycles. The Project Proponent ensures to maintain records substantiating the decision, ensuring preparedness for the commencement of the project. Further by reviewing supporting document/06/, it has been confirmed that project start date identified by PP, is in accordance section 3.4.1 of the ICR requirement Document v5.0/B01/.

Following section 3.4 of the ICR requirement Document v5.0/B01/, the crediting period identified for the proposed project is of 30 years starting from 16/04/2028 to 15/04/2058/01/. VVB confirms that the project area is protected by a legally binding commitment/05/ to continue management practices that protect carbon stocks over the length of the project crediting period.

Based on the review of the ICR PDD/01/, onsite inspection/interview/4.6//4.7/, and review of the legal binding agreement in place/05/, VVB confirms that Saudi Aramco has the rightful ownership of the carbon credits from the sale of ICCs generated from the GHG mitigations subjected to project implementation in the region. Further the project proponent (Saudi Aramco) has presented evidence to demonstrate ownership of land area subjected to implementation of mangrove planting practice under ICR project. VVB has verified the same by cross-checking the land titles/lease agreement documents/05/.

The accounting of ex-ante GHG removals has been carried out in line with section 5 of the applied methodology AR-AM0014 v3.0/B02/. The project activity upon implementing mangrove plantation in the project region, expects to generate 4,357 $tCO_2e$, with an average of 145 $tCO_2e$ GHG removals annually for the reported crediting period of 30 years/01-02//4.6/.

## 3.2 Description of the baseline scenario

The baseline scenario for the proposed project has been identified as "continuation of pre-project land use" i.e., degraded mangrove habitat in the project area. The baseline scenario was also witnessed and confirmed by the VVB during the on-site inspection/interview /4.6//4.7/. VVB confirms that identification and description of baseline scenario of project activity is following section 4.4 of ICR Requirements v5.0, section 6.4 of ISO 14064-2 requirements and section 5.4 of applied methodology AR-AM0014 and applied CDM Tool/B02/4.

The following steps have been followed:
**STEP 0. Preliminary screening based on the starting date of the A/R project activity.**

[4] Combined tool to identify the baseline scenario and demonstrate additionality (Ver 02.1). (unfccc.int)

*As per the applied tool/B02/, if project is claiming to have start date after 31 December 1999, before the date of its registration PP shall provide the following:*

*i) Evidence for start date of project activity (which is after 31 December 1999),*

*ii) Evidence (preferably official, legal and/or other corporate) that was available to third parties at, or prior to, the start of the project activity demonstrating the decision to incentivize project from the planned sale of CERs/VCUs/Carbon Credits.*

Based on the review of ICR PDD/01/ and proof of start date/06/, VVB confirms that the project start date is after 31st December 1999 and is in line with tool requirement/B03/.

**STEP 1: Identification of alternative scenarios**

Sub-step 1a. Identification of alternative land use scenarios to the proposed project activity

*As per the tool/B02/, this step requires the identification of realistic and credible land-use scenarios that would have occurred on the land within the proposed project boundary in the absence of the VCS/subject project activity. The identified land use scenarios shall at least include:*

- *Continuation of the pre-project land use,*
- *Forestation of the land within the project boundary performed without being registered as the A/R project activity, and*
- *If applicable, forestation of at least a part of the land within the project boundary of the proposed VCS project at a rate resulting from legal requirements or extrapolation of observed forestation activities in the geographical area with similar socio-economic and ecological conditions to the proposed VCS project activity occurring in a period since 31 December 1989 as selected by the PPs.*

As per the supporting evidence/05/ Saudi Aramco has the concession rights over the subject project area, issued by the Ministry of Petroleum and Mineral Resources, Riyadh. The absence of infrastructural plans for the project area, combined with strict regulations on the disturbance of tidal ecosystems by national and corporate legislation, has protected many areas within Saudi Aramco's concession zones in the Eastern Province from urban and population growth pressures/01//4.6/.

Thus, significant changes to the project area in the baseline scenario are highly unlikely. Therefore, the following possible alternatives to the project activity have been identified by PP are as follows/01//4.6/:

Scenario 1: Continuation of the pre-project land use.

Scenario 2: Natural mangrove regeneration within project boundaries.

Scenario 3: Mangrove reforestation of the land within the project boundary performed without being registered as a project activity intended for the carbon market.

The validation team has visited the sample sites, randomly identified within the project boundary, and observed that the pre-project scenario includes land-parcels of degraded mangrove lands/01//4.6//4.7/. Further below are some of the photographs of project area submitted by project's listing representative to indicate present conditions of the mangrove habitat/10/.


Figure 1: Baseline condition of the subject project area

VVB has further carried out its own analysis utilizing NDVI calculations derived from Sentinel-2 imagery of project area and confirmed that the potential area for plantation identified under proposed project is as described in the ICR PDD/01/ and consists of complex of degraded mangrove vegetation along with some barren land parcels.

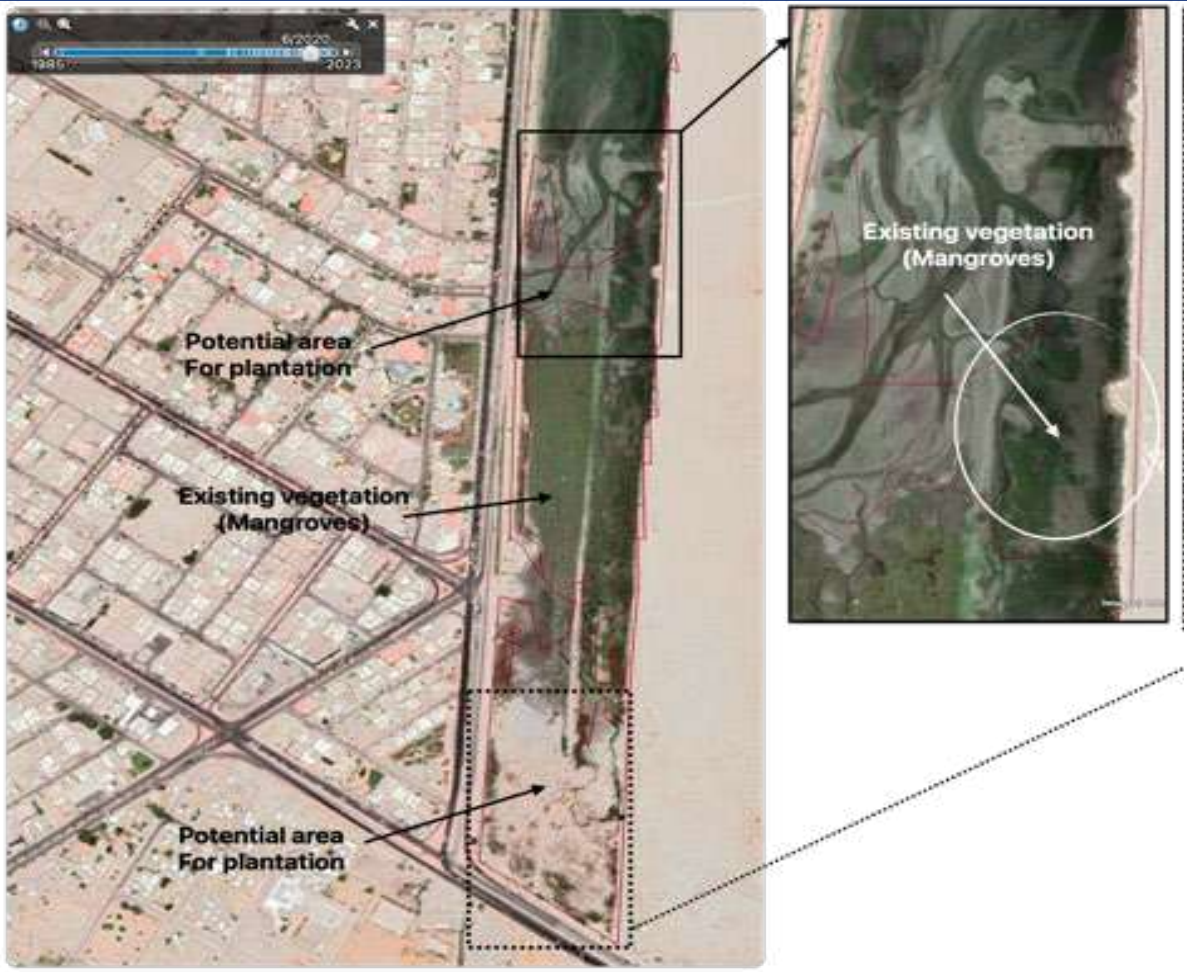


Figure 2: Project area including parcel of barren land and/or degraded mangrove vegetation.

VVB, based on the review of ICR PDD/01/, on-site inspection/4.7/ and review of supporting evidence/03//05//10/, confirms that the alternative land-use scenarios identified by PP are realistic and credible, most possible alternative scenario for the proposed project activity.

Sub-step 1b: Consistency of Alternative Land Use Scenarios with Applicable Laws and Regulations

*As per applied tool/B02/, this step is to find such land-scenario (among the scenarios identified in sub-step 1a.), which are in compliance with mandatory legislation and regulations taking into account their enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations.*

As per ICR PDD/01/, the alternatives identified comply with all applicable legal and regulatory requirements, governed by Saudi Arabia's Environmental Law and the associated Rules for Implementation on the Development of Vegetation Cover and Combating Desertification. The project's activities, including prior mangrove planting on Dammam region of Saudi Arabia, adhere to these laws and regulations, endorsing the continuation of pre-project activities and supporting revegetation and afforestation efforts within legal frameworks.

VVB confirms that the alternative scenarios align with the applicable laws and regulations, ensuring the project's compliance and contribution to environmental conservation and restoration efforts. The host country regulatory framework explicitly encourages revegetation and afforestation/01//4.6/.

Considering the desk-review[/01/] and on-site inspection/interview[/4.6//4.7/], VVB confirms that all the identified alternatives to the project activity in sub-step 1a., are following the applicable legal and regulatory requirements i.e., Environmental Law and the associated rules for Implementation on the Development of Vegetation Cover and Combating Desertification.

**STEP 2. Barrier analysis**

Sub-step 2a. Identification of barriers that would prevent the implementation of at least one alternative land use scenario.

As per the ICR PDD[/01/], the barriers preventing implementation of the alternative land use scenarios identified in the sub-step 1b. are as follows:

Table V: Barriers pertaining to implementation of the alternative land use scenarios:

| S. N. | Alternative land-use scenarios | Barriers | VVB Assessment |
|---|---|---|---|
| 1 | Continuation of pre-project land use | No barrier | Based on the review of the ICR PDD[/01/], physical inspection of project site[/4.7/], supplementary information[/10/], VVB assessment under sub-step 1a., it has been validated that the project area is subjected to degraded mangrove habitat along with presence of some barren land parcels.<br>Based on the on-site interviews[/4.6/] with the representative of project proponent it has been ascertained that in recent years project area has been affected by algal bloom due to nutrient enrichment[5] across Arabian gulf region.<br>Through literature review[6,7], it has been confirmed that although nutrient enrichment favors growth of shoots relative to roots, thus enhancing growth rates but increasing vulnerability to environmental stresses (high salinity and low humidity) that adversely affect plant water relations and thereby enhance mortality of the mangroves. Therefore, without intervention of project activity, continuation of degraded mangrove vegetation is expected to be the most likely land use scenario in the subject project area and found acceptable by the VVB. |
| 2 | Natural | Institutional | As per the ICR PDD[/01/], institutional barriers further impede natural mangrove regeneration, as existing policies and frameworks lack the |

[5] Aiman Eid Al-Rawajfeha,*, Ebtehal Alzalabieha, Ghada Al Bazedib,c, Ghassab M. Al-Mazaidehd, Mohammed Helmy Faris Shalayel, "A review on harmful algae blooms in Arabian Gulf: causes and impacts on desalination plants", 1944-3994/1944-3986 © 2023 Desalination Publications, 290 (2023) 46-55.

[6] (PDF) Spatial distribution and potential ecological risk assessment of some trace elements in sediments and grey mangrove (Avicennia marina) along the Arabian Gulf coast, Saudi Arabia (researchgate.net)

[7] (PDF) Nutrient Enrichment Increases Mortality of Mangroves (researchgate.net)

| | | |
|---|---|---|
| **mangrove regeneration within project boundaries** | Barrier | specificity and support required to promote and protect these vital ecosystems. The absence of targeted conservation strategies and regulatory support undermines efforts to encourage natural regeneration processes.<br>VVB based on the review of web pages[8, 9, 10, 11 12], has observed that even though Saudi Arabian government itself is committed to improve mangrove cover of coastal regions through human assisted natural regeneration however there remain a significant institutional barrier hindering the effectiveness of these efforts. VVB's review of relevant web pages, including government initiatives such as the Saudi Green Initiative and news articles from reputable sources like Arab News and SPA, indicates that despite the commitments to environmental initiatives and significant investments in mangrove restoration projects, there is a gap between policy intent and enforceable guidelines necessary for promoting natural regeneration along the Arabian coasts.<br>VVB confirms that PP has correctly identified the institutional barriers as a key barrier to natural mangrove regeneration. The absence of targeted conservation strategies and regulatory support undermines restoration efforts as described in the ICR PDD[/01/13]. |
| | Technological Barrier | As per the ICR PDD[/01/], and per discussion with project personnel[/4.6/], it has been highlighted that the remote sensing-based observation for mapping, monitoring, and evaluating restoration sites to ensure accurate assessment of needs and the implementation of effective restoration strategies and therefore to gather essential data on soil quality, hydrology, and existing vegetation. PP anticipates incorporating drone-based surveillance and advanced technological tools to monitor project activity during its technical life.<br>Based on the on-site inspection/interviews[/4.6//4.7/], VVB confirms that |

[8] https://www.vision2030.gov.sa/en/projects/saudi-green-initiative/
[9] https://www.arabnews.com/node/2008876/saudi-arabia
[10] https://www.aramco.com/en/news-media/elements-magazine/2020/2-million-mangroves-added-to-the-carbon-front-line
[11] https://www.arabnews.com/node/2130181/saudi-arabia
[12] https://www.spa.gov.sa/en/348f5a275aq

[13] Mangrove Restoration and Mitigation After Oil Spills and Development Projects in East Africa and the Middle East | SpringerLink

| | | |
|---|---|---|
| | | lack of advanced technological tools directly impacts the ability to assess the conditions of mangrove restoration sites accurately. Without precise data on soil quality, hydrology, and existing vegetation, the formulation and execution of effective restoration strategies are hindered, ultimately inhibiting natural regeneration efforts in the subject region. |
| | Ecological Barrier | As per the ICR PDD/01, the project area's isolation from viable sources of mangrove propagules, compounded by unfavorable hydrological conditions, severely limits the potential for natural mangrove regeneration. PP has identified following ecological factors hindering natural regeneration of mangrove in the project area:<br>• Isolation from Viable Propagule Sources: Based on physical inspection of the project site/4.7/, it has been observed that the project area consists of degraded mangrove vegetation and/or parcel of barren lands resulting in lack of availability potential seed source for natural regeneration. However, in project scenario human-assisted mangrove plantation (planting seedlings of *Avicennia marina*) is expected to remove this barrier/4.6/.<br>• Unfavorable hydrological conditions: As described in VVB assessment for alternative scenario 1 that the project area has witnessed a gradual effect of algal bloom in the Arabian gulf region which also changes the hydrological conditions and can directly impact mangrove health and regeneration potential[14].<br>Therefore, VVB concludes/15/16/ that the identified ecological barrier is appropriate and applicable for the project activity. |
| **3 Mangrove reforestation of land within the** | Technological Barrier | One of the technological barriers for mangrove plantation is the limited availability and accessibility of Geographic Information Systems (GIS) data specific to mangrove ecosystems in the region. GIS plays a crucial role in mapping, monitoring, and managing mangrove |

[14] https://www.jstor.org/stable/44518725

[15] https://www.researchgate.net/publication/281729326_A_review_on_the_impact_of_exotoxicology_and_oil_spills_in_mangrove_of_Saudi_Arabia

[16] https://response.restoration.noaa.gov/sites/default/files/Oil_Spill_Mangrove.pdf

| | | |
|---|---|---|
| **project boundaries without being registered as a project activity intended for the carbon market** | | habitats by providing spatially explicit information essential for decision-making and conservation efforts. Without comprehensive and up-to-date GIS data tailored to Saudi Arabia's unique environmental conditions, it can be challenging to accurately plan and implement mangrove plantation projects. With the use of model and approaches including Eddy Covariant Tower for Real-time carbon flux data collection, GIS and Remote Sensing, used for mangrove health assessment and RothC model for Soil Modelling, the project can mitigate this barrier.<br><br>Considering the above-mentioned VVB assessment for technological barrier preventing scenario 2, it has been confirmed that the barrier identified for the subject alternative land use scenario is in line with applied tool and acceptable to the VVB. |

Based on the above-mentioned assessment, VVB confirms that the barriers identified by the PP are in accordance with the applied tool/B02/ thus are valid and applicable.

Sub-step 2b. Elimination of land use scenarios that are prevented by the identified barriers.
The land-use scenario 2 is prevented by ecological, technological, and institutional barrier and scenario 3 by technological barrier, thus have been eliminated. The only alternative land-use scenario that is expected to continue is scenario 1 i.e., continuation of pre-project land-use/01//4.6/.

Sub-step 2c. Determination of baseline scenario (if allowed by the barrier analysis)

Based on the assessment of identified alternative land use scenario and pertinent barriers, VVB confirms that the most plausible baseline scenario for the proposed project activity is continuation of pre-project land use i.e., degraded partially vegetated mangrove habitat in the project area along with parcels of barren land. VVB, confirms that the approach and the baseline scenario identified is valid and acceptable.

**STEP 3: Investment analysis**
As per the CDM tool guidance/B02/,
"Step 3: Investment analysis; This Step serves to determine which of the alternative scenarios in the short list remaining after Step 2 is the most economically or financially attractive".
As described under preceding steps, there in only one alternative scenario that is not being prevented by any barrier, thereby investment analysis has not been performed for the proposed project activity.

**STEP 4: Common practice analysis**
As per the project description/01/ and discussion with the representative of project proponent/4.6/, the proposed ICR project is an initiative focusing on the restoration and reforestation of degraded areas using native mangrove species, with the primary objective of enhancing greenhouse gas (GHG) emission removal.

A thorough examination of publicly available information, including databases such as the Clean Development Mechanism (CDM), Verified Carbon Standard (VCS), and Gold Standard (GS) registries, indicates the absence of comparable native mangrove restoration projects in the host country of Saudi Arabia. No similar projects have

been identified in the region. Therefore, VVB confirms that the ICR project is not a common practice in the subject region and is additional per applied CDM Tool[/B02/].

## 3.3 Projected emissions mitigations

Table V: Net GHG emissions and mitigations from the ICR project over the project crediting period (30 years):

| Year | Baseline emissions ($tCO_2e$) | Project emissions ($tCO_2e$) | Estimated leakage ($tCO_2e$) | Reductions ($tCO_2e$) | Removals ($tCO_2e$) | Total GHG emission mitigations ($tCO_2e$) |
|---|---|---|---|---|---|---|
| 16 /04/2028 to 31 December 2028 | 0 | | 0 | 0 | 0 | 0 |
| 1 January 2029 to 31. December 2029 | 0 | | 0 | 0 | 14 | 14 |
| 1 January 2030 to 31. December 2030 | 0 | | 0 | 0 | 23 | 23 |
| 1 January 2031 to 31. December 2031 | 0 | | 0 | 0 | 32 | 32 |
| 1 January 2032 to 31. December 2032 | 0 | | 0 | 0 | 41 | 41 |
| 1 January 2033 to 31. December 2033 | 0 | | 0 | 0 | 50 | 50 |
| 1 January 2034 to 31. December 2034 | 0 | | 0 | 0 | 59 | 59 |
| 1 January 2035 to 31. December 2035 | 0 | | 0 | 0 | 68 | 68 |
| 1 January 2036 to 31. December 2036 | 0 | | 0 | 0 | 77 | 77 |
| 1 January 2037 to 31. December 2037 | 0 | | 0 | 0 | 86 | 86 |
| 1 January 2038 to 31. December 2038 | 0 | | 0 | 0 | 95 | 95 |
| 1 January 2039 to 31. December 2039 | 0 | | 0 | 0 | 104 | 104 |
| 1 January 2040 to 31. December 2040 | 0 | | 0 | 0 | 113 | 113 |
| 1 January 2041 to 31. December 2041 | 0 | | 0 | 0 | 123 | 123 |
| 1 January 2042 to 31. December 2042 | 0 | | 0 | 0 | 132 | 132 |
| 1 January 2043 to 31. December 2043 | 0 | | 0 | 0 | 141 | 141 |
| 1 January 2044 to 31. December 2044 | 0 | | 0 | 0 | 150 | 150 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 January 2045 to 31. December 2045 | 0 | | 0 | 0 | 159 | 159 |
| 1 January 2046 to 31. December 2046 | 0 | | 0 | 0 | 168 | 168 |
| 1 January 2047 to 31. December 2047 | 0 | | 0 | 0 | 177 | 177 |
| 1 January 2048 to 31. December 2048 | 0 | | 0 | 0 | 186 | 186 |
| 1 January 2049 to 31. December 2049 | 0 | | 0 | 0 | 195 | 195 |
| 1 January 2050 to 31. December 2050 | 0 | | 0 | 0 | 204 | 204 |
| 1 January 2051 to 31. December 2051 | 0 | | 0 | 0 | 213 | 213 |
| 1 January 2052 to 31. December 2052 | 0 | | 0 | 0 | 222 | 222 |
| 1 January 2053 to 31. December 2053 | 0 | | 0 | 0 | 231 | 231 |
| 1 January 2054 to 31. December 2054 | 0 | | 0 | 0 | 241 | 241 |
| 1 January 2055 to 31. December 2055 | 0 | | 0 | 0 | 250 | 250 |
| 1 January 2056 to 31. December 2056 | 0 | | 0 | 0 | 259 | 259 |
| 1 January 2057 to 31. December 2057 | 0 | | 0 | 0 | 268 | 268 |
| 1 January 2058 to 15 April 2058 | | | | | | 277 |
| **Total** | **0** | | | | | 4357 |
| **Annual average** | | | | | | 145 |

VVB, based on the review of ICR PDD[/01/] ex-ante carbon calculation sheet[/02/] and on-site inspection/interviews[/4.6/] confirms that the projected ex-ante emission removals generated from the proposed project are in line with the methods/criteria and assumptions as mentioned in the ICR PDD[/01/].

# 4. Validation activities

## 4.1 Validation planning

**Validation Planning includes:**

- ✓ Perform strategic analysis
- ✓ Identify materiality thresholds
- ✓ Test estimates
- ✓ Assess GHG related activity characteristics
- ✓ Develop validation verification plan
- ✓ Develop evidence gathering plan
- ✓ Approve the validation plan & evidence gathering plan
- ✓ Amend the validation plan & evidence gathering plan, if required

| Task | Performed (Y/N) |
|---|---|
| Strategic analysis | ☒ |
| Materiality thresholds | ☒ |
| Test estimates | ☒ |
| Assessment of GHG-related activity characteristics | ☒ |
| Validation plan | ☒ |
| Evidence-gathering plan | ☒ |

## 4.2 Validation plan

A project specific validation and verification plan has been developed to guide the auditing process to ensure efficiency and effectiveness. The purpose of the validation and verification plan is to present a risk assessment for determining the nature and extent of validation and verification procedures necessary, thus reducing the risk of auditing error to a reasonable level. The validation of the ICR PDD/01/ has been conducted in compliance with the requirement documents/B01-B03/.

| Milestones | Time |
|---|---|
| Date of Contract Signing | 03/01/2024 |
| Submission of VV Plan | 19/01/2024 |
| On-site inspection | 24/01/2024 |
| Submission of DVR | At the end of OSV |

To ensure a complete, transparent, and timely execution of the validation task, the team leader had planned the complete sequence of events necessary to arrive at a substantiated final validation and verification opinion. Various tools have been established to ensure an effective assessment planning.

**Step I- Strategic Analysis**
In accordance with the section 6.1.1 of ISO 14064-3, VVB has carried out strategic analysis of project in following steps:

- ✓ Identification of the types of potential material misstatements and their likelihood of occurrence.
- ✓ Identification of evidence-gathering procedures that are the basis for VVB's assessment and conclusions.

**Step II- Identifying the Materiality Threshold:** Please refer to section 2.5 of this report.

**Step III- Identifying risks, their level and assessment:** The validator has used a risk-based process to identify evidence to be collected for each characteristic of the proposed project activity.

| No. | Risk that could lead to material errors, omissions, or misstatements | Assessment of the potential risk | | Assessment of the records/information/interview with personnel to check controls/ mitigation measures |
|---|---|---|---|---|
| | | Risk level | Justification | |
| 1. | **ICR project activity requirements**<br>Adherence to ICR rules and requirements including those related to ISO 14064-2, and applicable category CDR: Afforestation/reforestation. | High | This corresponds to high risk since compliance with the ICR and ISO 14064-2 rules and requirements is critical for the project. | The risk has been mitigated by reviewing the ICR PDD and supporting documents thoroughly in compliance with each section of ICR template instructions and ICR requirements, v5.0 and ISO 14064-2 |
| 2. | **Ownership**<br>Adherence to ownership and legal right of the project including the proof of right of carbon credits | Low | As per the ICR PDD v1.2, PP itself is the landowner for the subject region and has concession rights issued by Ministry of Petroleum and Mineral Resources.<br><br>The evidence of project ownership, in respect to project proponent, shall be assessed. VVB considers this as low risk. | The risk has been mitigated by checking the contractual agreement between SAUDI ARAMCO and Ministry of Petroleum and Mineral Resources assigned of project implementation and proof of title. |
| 3. | **Baseline methodology**<br>Adherence to selected baseline protocol as per the applied methodology, AR-AM0014, Version 03.0 and applicability and temporal boundaries. | Medium | This corresponds to medium risk category since compliance with the applied methodology, AR-AM0014 v03.0, is critical for the project. | The risk has been mitigated by reviewing the evidence for pre-project scenario and confirming the same by observation and interviews during the on-site inspection. |
| 4. | **Time period (for e.g., project start date, start date of crediting period and length of crediting period) covered by Project Report**<br>Adherence to the ICR requirements for start date, crediting period and length of the project | Medium | Project shall meet the ICR requirements for time such as project start date and crediting period specific for the project and risk has been considered to be medium by VVB | The risk has been mitigated by reviewing the evidence pertaining to the project start date including the time stamped pictures, contracts, and receipts.<br><br>Assessment shall consider the ICR rules and requirements for start date and crediting period specific for the proposed project. |
| 5. | **Baseline Scenario and Additionally**<br>Accuracy of baseline scenario identification and compliance with eligibility | High | The baseline determination and additionality demonstration have a high risk in opinion of VVB | The risk has been mitigated by interviews and review of evidence of baseline and additionality during on-site inspection. |

| | | | | |
|---|---|---|---|---|
| | for positive list for additionality demonstration as per ICR requirements, applied methodology, and additionality tool. | | | |
| 6. | **Baseline assertion**<br><br>Accuracy of baseline assertion | Medium | Considering the project activity, applying the methodology AR-AM0014 v03.0, the risk for the baseline assertion including the compliance with determination of schedule of activities in the baseline scenario as stated in the methodology, is considered as medium. | The risk has been mitigated by reviewing systematic sampling, source data and calculations |
| 7. | **Correctness of source of data used for Emission reduction estimation/calculation.**<br><br>Accuracy of default/ex-ante fixed values and allometric equations used for the ex-ante carbon calculation. | High | As per the methodology, various sources for the data such as default values from equations shall be used, including IPCC, and any other Peer-reviewed published data. This forms a high risk for overall carbon removals from the project. | The risk has been mitigated by assessment of all sources, sinks and reservoirs that are included in the project report during the on-site inspection. |
| 8. | **Emission reduction estimation including future estimate / calculation.**<br><br>Accuracy of default/ex-ante fixed values and allometric equations used for the ex-ante carbon calculation. | Medium | PP has used various sources for the data such as default values from IPCC and the applied methodology including literature reports. Furthermore, accuracy in equations and formula applied in the spreadsheet has material impact on the carbon removals from the project. This forms a medium risk for overall carbon removals from the project. | This risk has been mitigated by cross-checking emission reduction calculation spread sheet including all baseline emission, project emission, leakage emission and final emission reduction calculation. |
| 9. | **Monitoring Plan**<br><br>Monitoring of the project as per the ICR requirements and applicability of section 6 of the applied methodology including monitoring approach, PP sample size and area of sample plots, | High | Due to the complexity of the applied methodology, as well as sampling procedure, the risk is considered high. The monitoring approach for area of sample plot, data/parameters sampling points, monitoring of | The risk has been mitigated by reviewing the measurement, calculation, and management /sampling plan of monitoring parameter during the on-site inspection, as per the applied methodology. |

| | | | | |
|---|---|---|---|---|
| | monitoring of project implementation | | project implementation, the compliance of WRC requirements add further complexity to the monitoring. | |
| 10. | **ICR project design description (PDD)**<br><br>Completeness and correctness of project description. | High | Since the project design has multiple components (the project type is ARR along with inclusion of WRC: Wetland Restoration & Conservation component), the appropriate description of all the aspects including the applied methodology is pertinent. Hence, in the opinion of VVB, this risk is considered as high. | The risk has been mitigated by reviewing adherence of the ICR PDD to the actual site condition for e.g., the existence of the project; project start date; GHG inventory of sources and sinks; sources and sinks; records kept on site. |
| 11. | **Permanence Risk**<br><br>Accuracy of assessment of permanence of carbon stock and buffer credits. This includes the assessment of a non-catastrophic reversal in line with Sections 3.2.20 of the VCS Standard, v4.5. | Medium | The risk of permanence due to various factors such as project management financial, pest, sea level rise, change in flow of water channels during project's technical life etc. is medium. | The risk has been mitigated by cross-checking each risk affecting the permanence nature of carbon stock as per the ICR non-permanence risk tool with evidence provided by the PP. The project management plan (including implementation plan) & ownership of land, roles & responsibility to be checked during the on-site inspection and through document review. |
| 12. | **Leakage**<br><br>Identification of source of project emissions including leakage due to shifting of grazing animals or shifting of agricultural activities. | Low | Since the project includes mangroves plantation on degraded mangrove habitat hence, in the opinion of VVB, no shifting of activities has taken place, thus this risk corresponds to low category. | The risk has been mitigated by confirming the pre-project scenario through on-site inspection and interviews that there is no displacement of pre-project activities due to project implementation. |
| 13. | **Project Area and Eligibility**<br><br>Assessment of eligibility of land and calculation of area for each geographic area specified in the ICR PDD. | High | As per the applied methodology, the project activity shall not imply the removal of any pre-existing vegetation from the project region.<br><br>Further the baseline land use in the project region shall be degraded | The risk has been mitigated by interviewing the contractors of the project implementation and by further reviewing documents to cross check the land-use pattern and temporal boundaries of the project and first PAI. On-site inspection of sample sites and review of project management plan. |

| | | | | |
|---|---|---|---|---|
| | | | mangroves which forms high risk. | |
| 14. | **Participation under any other GHG Program**<br><br>Risk of double counting of project or carbon credits | Medium | Since the project is implemented and owned by the PP, checking of title of land and owner of carbon credits including project's existence in any other GHG program corresponds to a medium-risk category. | The risk has been mitigated by reviewing agreement of PP with contractors, land ownership proof, proof for waiver of carbon credits by the other entities along with checking the project on other registries. |

## 4.3 Evidence gathering plan

Validation team has developed the evidence gathering plan based on the project specific risk assessment. The evidence gathering plan has been designed to lower the validation risk to an acceptable level. The evidence-gathering activities and techniques followed by VVB in the project validation are as follows:

- Inquiry - information and clarifications from the PP through formal written requests.
- Observation/Examination - During on-site visit, physical examination of actual baseline scenario.
- Reviewing records and documents - documentary evidence provided alongside the PDD.
- Recalculation - an independent checking of the GHG quantification procedures and calculations presented in documents and data provided against the methodology and tools guidelines.
- Analytical process – from peer reviewed studies/sources especially relevant to baseline scenario
- External Confirmation - peer reviewed journals, and studies conducted about existing conditions prior to the project activity as described in the ICR PDD.

VVB has assessed and evaluated all statements and relevant evidence provided by the project proponent to ensure the compliance of all the information stated in ICR PDD/01/ and supporting documents against the ICR and ISO guidance requirements/B01/.

In accordance with the section 7.2.3 of ISO 14064-3, VVB assessed the following:

- ✓ Whether the GHG statement made by PP is accurate and complete: with appropriate justification or relevant information.
- ✓ Whether the disclosure is a fair reflection of the GHG-related activities: including identification of project boundary (both temporal and spatial/geographic), baseline type demonstration of the project additionality, and the models followed for the quantification purpose.
- ✓ Whether the disclosure contains unintended bias: particularly related to expert knowledge, default value, peer reviewed data, used for the carbon calculations.
- ✓ Whether the disclosure addressed the intended user's requirements and needs.

## 4.4 Activities and techniques

The validation of the project includes the following activities:

- ✓ Contract review & signing between VVB and project proponent.
- ✓ Appointment of team members based on competencies and sectoral expertise.
- ✓ Assessment Planning
- ✓ Desk review on ICR PDD/01/, carbon calculation spreadsheets (ex-ante & ex- post) and other documents- to cross check and evaluate project particulars against applicable requirements/B01-B03/.
- ✓ Interviews with the stakeholders and local stakeholder meeting(s) during the on-site inspection- to physically inspect the project design.

- ✓ Reporting and recording of assessment (Draft Validation Report)- to report and issuance of VVB opinion on project particulars.
- ✓ Reporting findings and their closure- to address non-compliance issues identified during the assessment process.
- ✓ Independent technical review of the draft validation report and final/revised documentation to independently confirm whether the applicable GHG program requirements were objectively met or no
- ✓ Reporting and closure of TR comments/findings (CARs/CLs/FARs) and final approval for the decision made.
- ✓ Additional validation activities
- ✓ Submission of final validation report

During the field review of the project, the following aspects of the project has been assessed:

- ✓ Geographical boundary of the project activity
- ✓ GHG removal interventions involved in the project.
- ✓ Physical infrastructure, activities, technologies, and processes of the ICR project
- ✓ Project ownership
- ✓ Project start date, project length.
- ✓ GHG sources, sinks and gases.
- ✓ Project eligibility as per ICR and applied methodology requirement.
- ✓ Eligibility of project under applied methodological approach
- ✓ Stakeholder engagement, Grievances received, and actions taken (if any)
- ✓ Environmental impacts; Forest/non-forest analysis
- ✓ Baseline identification and additionality demonstration
- ✓ Sustainable development contributions
- ✓ Leakage assessment
- ✓ Monitoring plan and SOPs for project monitoring and field data collection; Sampling approach
- ✓ Estimated (Ex-ante) GHG removals and uncertainty analysis.
- ✓ Calculation of ICCs (Ex-post)
- ✓ Risk assessment for permanence.
- ✓ Interviews with participating members and MRV personnel

## 4.5 Review of documented information

During the document review, CCIPL applied standard auditing techniques to assess the quality of information provided. The joint validation and verification are performed primarily based on the review of the ICR PDD/01/ and the supporting documentation.

For validation, this process includes:

- A review of data and information presented to verify completeness and consistency in accordance with ICR requirement document/B01/ requirements.
- A review of the project description/01/ and monitoring methodology/B02/, paying particular attention to the applicability conditions of the methodology, baseline, and additionality related requirements.
- A review of the monitoring plan and the project's compliance with relevant ICR and ISO criteria/B01/.

The ICR PDD (version 1.2, 10/01/2024) was initially reviewed and CCIPL requested the PP to present the supporting information and documents. Inconsistencies between the PDD and the stated criteria were considered findings and identified for corrective actions. Appropriate justification for any noncompliance with the validation criteria was also sought. All the findings have been raised and resolved and have been described under Appendix III of this report. Refer to Appendix I, outlining the documentation reviewed during the validation process.

## 4.6 Interviews

An on-site inspection has been performed by the members of the validation team of Carbon Check on 24/01/2024 at PP's office and project's sample plantation sites in Dammam, Saudi Arabia.

Interview has been performed to confirm and verify the project design and description as stated in the supplementary documentation (please refer Appendix I) and further to analyze on-ground status of the project. The validation & verification team member met with individuals with various roles in the project. This included a series of interviews with project management and on-site and in-country staff that support the mission of the project.

The table below summarizes the on-site inspection interview process and personnel identified by VVB, including their roles, who were interviewed and/or presented information additional to that provided in the ICR PDD/01/ and any supporting documents.

| Sl. No. | Name (Organisation) | Date | Type | Topic |
|---|---|---|---|---|
| /i/ | Mutairi Thamer S. (Division Head, MFD, Saudi ARAMCO) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | • PP's roles and responsibilities.<br>• Future project plans.<br>• Organization structure, roles, and responsibilities.<br>• Non-Permanence riskAssessment<br>• Ownership of land titles<br>• Ownership of carboncredits<br>• Declaration to demonstrate that the project has not been registered nor is seeking registration under any other.<br>• GHG programs and has neither applied for nor has been rejected by any other GHG program. |
| /ii/ | Ahmed A. Otaibi (Senior Scientist, Saudi ARAMCO) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | • Baseline scenario<br>• Project implementation.<br>• Future project plans.<br>• Non-Permanence RiskAssessment<br>• Plantation techniques<br>• Monitoring methodology<br>• Sampling Forest inventory<br>• PP's roles and responsibilities<br>• Baseline scenario.<br>• Project implementation.<br>• Future project plans.<br>• Organization structure, roles and responsibilities.<br>• Non-Permanence riskAssessment<br>• Ownership of land titles<br>• Ownership of carboncredits |
| /iii/ | Abdulkarim S. Abushullaih (Environmental Scientist, Saudi ARAMCO) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /iv/ | Rajeev Kumar (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /v/ | Abdul Kader Abdul Samad (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /vi/ | Saad M. Alhuraib (Environmental | 24th January 2024 | ☒ On-site<br>☒ Face to Face | • Induction Training |

| | | | | |
|---|---|---|---|---|
| | Scientist, Saudi ARAMCO) | | ☐ Telephone<br>☐ Email<br>☐ Skype | • Plantation techniques<br>• Training of forest personnel with respect to monitoring<br>• Monitoring methodology<br>Sampling<br>• Baseline scenario<br>• Project implementation.<br>• Non-Permanence RiskAssessment<br>• Plantation techniques<br>• Monitoring methodology<br>• Growth models<br>• Ex-ante & ex-post Carbon Calculation.<br>• Monitoring of project based on sampling plot, measurement technique, sample size calculation anduncertainty analysis.<br>• Sampling<br>• Forest inventory<br>Remote sensing dataanalysis including eligible plantation area, modelling of sea level rise to account loss and gin of area, baselineassessment includingpreparation of biomass growth curve andaccounting of fossil fuel in the carbon calculation. |
| /vii/ | Akshay (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /viii/ | Suneesh (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /ix/ | Vineeth Vinod (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /x/ | Sharon Mathew Yadgreen) | 24th January 2024 | ☐ On-site<br>☐ Face to Face<br>☐ Telephone<br>☐ Email<br>☒ Virtual | |
| /xi/ | Ruben (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |
| /xii/ | Asna Nizar (Yadgreen) | 24th January 2024 | ☒ On-site<br>☒ Face to Face<br>☐ Telephone<br>☐ Email<br>☐ Skype | |

## 4.7 Inspection

The validation on-site inspection has been conducted on 24/01/2024. A ground truthing and the on-site inspection/interviews with PP and relevant stakeholders of the project has been conducted to assess project implementation, baseline scenario and project scenario as mentioned in PDD. Members of the CCIPL team visited selected plots and confirmed pre-project scenario was degraded status of the mangroves.

## 4.8 Conformity

Subject to submission of project documents/finding issuance or closure.

| Criteria | Assessed | No. non-conformities | Resolved |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **1. Project description** | | | |
| 1.1 Purpose, objectives and general description of the project | ☒ Y ☐ N | CL 20 | ☒ Y ☐ N ☐ N/A |
| 1.2 Project type and sectoral scope | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.3 Project | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.3.1 Eligibility criteria for grouped project | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 1.4 Location | ☒ Y ☐ N | CL 01 | ☒ Y ☐ N ☐ N/A |
| 1.5 Conditions prior to implementation | ☒ Y ☐ N | CL 25 | ☒ Y ☐ N ☐ N/A |
| 1.6 Technology applied | ☒ Y ☐ N | CL 02 | ☒ Y ☐ N ☐ N/A |
| 1.7 Roles and responsibilities | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.7.1 Project proponent(s) | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.7.2 Others involved in the project | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.8 Chronological plan / implementation | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.9 Eligibility | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.10 Funding | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 1.11 Ownership | ☒ Y ☐ N | CL 16 | ☐ Y ☐ N ☐ N/A |
| 1.12 Other certifications | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 1.13 Double counting, issuance and claiming | ☒ Y ☐ N | CL 18 | ☒ Y ☐ N ☐ N/A |
| 1.13.1 Other registration and double issuance | ☒ Y ☐ N | CL 18 | ☒ Y ☐ N ☐ N/A |
| 1.13.2 Double claiming and other instruments | ☒ Y ☐ N | CL 18 | ☒ Y ☐ N ☐ N/A |
| 1.14 Other benefits | ☒ Y ☐ N | CL 05 | ☒ Y ☐ N ☐ N/A |
| 1.15 Host country attestation | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 1.16 Additional information | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 1.16.1 Confidential/sensitive information | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| **2. Crediting** | | | |
| 2.1 Project start date | ☒ Y ☐ N | CL 07 | ☒ Y ☐ N ☐ N/A |
| 2.2 Expected operational lifetime or termination date | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 2.3 Crediting period | ☒ Y ☐ N | CL 16 | ☒ Y ☐ N ☐ N/A |
| 2.4 Calander year of crediting | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| **3. Safeguards** | | | |
| 3.1 Statutory requirements | ☒ Y ☐ N | CL 19 | ☒ Y ☐ N ☐ N/A |
| 3.2 Potential negative environmental and socio-economic impacts | ☒ Y ☐ N | CL 08 | ☒ Y ☐ N ☐ N/A |
| 3.3 Consultation with interested parties and communications | ☒ Y ☐ N | CL 09 | ☒ Y ☐ N ☐ N/A |
| 3.3.1 Stakeholders and consultation | ☒ Y ☐ N | CL 09 | ☒ Y ☐ N ☐ N/A |
| 3.3.1 Public comments | ☒ Y ☐ N | CL 11 | ☒ Y ☐ N ☐ N/A |
| 3.4 Environmental impact assessment (EIA) | ☒ Y ☐ N | CL 04 | ☒ Y ☐ N ☐ N/A |
| 3.5 Risk assessment | ☒ Y ☐ N | NA | ☒ Y ☐ N ☐ N/A |
| 3.5.1 Additional information on risk management | ☒ Y ☐ N ☐ N/A | NA | ☒ Y ☐ N ☐ N/A |
| **4. Methodology** | | | |
| 4.1 Reference to applied methodology and applied tools | ☒ Y ☐ N ☐ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 4.2 Applicability of methodology | ☒ Y ☐ N ☐ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 4.3 Deviation from applied methodology | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |

| | | | |
|---|---|---|---|
| 4.4 Other information relating to methodology application | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| **5. Additionality** | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 5.1 Level 1 - ISO 14064-2 GHG emissions additionality | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 5.2 Level 2a – Statutory additionality | ☒ Y ☐ N ☐ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 5.3 Level 2b – Non-enforcement additionality | ☒ Y ☐ N ☐ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 5.4 Level 3 – Technology, institutional, common practice additionality | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 5.5 Level 4a – Financial additionality I | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 5.6 Level 4b – Financial additionality II | ☐ Y ☐ N ☒ N/A | NA | ☐ Y ☐ N ☐ N/A |
| 5.7 Level 5 – Policy additionality | ☒ Y ☐ N ☐ N/A | NA | ☐ Y ☐ N ☐ N/A |
| **6. Baseline Scenario** | ☒ Y ☐ N | CL 20 | ☒ Y ☐ N ☐ N/A |
| **7. Project Boundary** | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| **8. Quantification of GHG emission mitigations** | ☒ Y ☐ N | CAR 06 | ☒ Y ☐ N ☐ N/A |
| 8.1 Criteria and procedures for quantification | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 8.1.1 Baseline emissions | ☒ Y ☐ N | CL 15 | ☒ Y ☐ N ☐ N/A |
| 8.1.2 Project emissions | ☒ Y ☐ N | CL 15 | ☒ Y ☐ N ☐ N/A |
| 8.1.3 Leakage | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 8.2 Quantification of Net-GHG emissions and/or removals | ☒ Y ☐ N | CAR 06 | ☒ Y ☐ N ☐ N/A |
| 8.3 Risk assessment for permanence | ☒ Y ☐ N ☐ N/A | CAR 08 | ☒ Y ☐ N ☐ N/A |
| **9. Management of data quality** | ☒ Y ☐ N | CL 13 | ☒ Y ☐ N ☐ N/A |
| **10. Monitoring** | | | |
| 10.1 Monitoring plan | ☒ Y ☐ N | CL 12 | ☒ Y ☐ N ☐ N/A |
| 10.2 Data and parameters remaining constant | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |
| 10.3 Data and parameters monitored | ☒ Y ☐ N | NA | ☐ Y ☐ N ☐ N/A |

# 5. Validation Findings

## 5.1 Project Description

### 5.1.1 Purpose, objectives, and general description of the project

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 20 was raised and resolve upon PDD revision. |
| Conclusion | The proposed project activity, "Dammam DR Sustainable Wetlands and Mangrove Conservation (DD-SWAM)", is a comprehensive environmental endeavor focused on restoring and conserving mangrove ecosystems in Dammam DRT, Saudi Arabia. Centered on the resilient black mangrove species (Avicenna marina), this initiative employs a variety of strategies, including afforestation, reforestation, and revegetation (ARR). With a primary emphasis on carbon sequestration, coastal protection, and biodiversity enhancement, DD-SWAM utilizes advanced methodologies such as eddy covariance towers and remote sensing, aligning with ISO 14064-2:2019 standards. Through its goals of improving mangrove health, fostering sustainability, and promoting conservation efforts, the project expects positive ecological impact/01//4.6/.<br><br>Before the project activity, the Dammam region of Saudi Arabia, has been grappling with a series of environmental challenges over the years. These include pollution from industrial activities, the oil spill of 1990, and overall degradation due to various factors. The project is aiming at contributing to climate change mitigation by removing greenhouse gases from the atmosphere through mangrove plantation (especially *Avicennia marina*). Which is one of the most dominant species in the region and expected to enhance carbon stocks in both biomass and soil/sediments/01//17. By reviewing the literature reference[13, 18, 19] and verified during on-site inspection/4.7/, VVB confirms that *Avicennia marina* is one of the most likely to be the suitable mangrove species for the project region thus has been identified for plantation by PP.<br><br>The project activities are regulated by the "Environmental Law" and the associated Rules for Implementation on The Development of Vegetation Cover and Combating Desertification of The Environmental Law. The project complies with these regulations/01//4.6/. The project has not been registered under any other GHG programs and is not seeking registration under any other GHG programs/01/. This has been further confirmed by the VVB by checking on other registries (CDM/GS/GCC/Plan Vivo)/B03/ and by reviewing the declaration/08/ by PP.<br><br>The start date of the project as per the ICR PDD/01/, would be 16/04/2028, as this would be the date on which the project starts planting mangroves and is the activity leading to the generation of GHG removals. The total expected operational lifetime and/or crediting period of the project is identified as 30 years. The project proponents have chosen to design this project as a 15-year long project renewable again for 15 years, making 30 years |

[17] https://www.researchgate.net/publication/306100465_Mangrove_ecosystem_of_Saudi_Arabian_Red_Sea_coast_-_an_overview

[18] https://www.researchgate.net/publication/290487516_Distribution_of_mangroves_along_the_Red_Sea_coast_of_the_Arabian_Peninsula_Part-1_The_northern_coast_of_western_Saudi_Arabia

[19] https://link.springer.com/chapter/10.1007/978-3-662-45201-1_33

| | |
|---|---|
| | in total. The total estimated GHG emission removals from the project are 4,357 $tCO_2e$ over the crediting period of 30 years with an annual average of 145 $tCO_2e$.<br>Based on the review of the ICR PDD/01/ and supporting documentation/02-10/, information on project activity provides a clear understanding of the project, the purpose/objectives, and the technical aspects of the project implementation. The ICR PDD/01/ satisfactorily demonstrates project particulars in line with the ICR requirement v5.0 and ISO 14064-2/B01/. |

### 5.1.2 Project type and sectoral scope

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Applicable ICR sectoral scope: 14 - Afforestation and reforestation[20]<br><br>VVB has confirmed by desk-review and onsite inspection/01//4.7/, that the proposed ICR Carbon Dioxide Removals (CDR) project has been planned to be developed under the sectoral scope 14: Afforestation and reforestation along with integration of mangrove habitat restoration and conservation in the region.<br>Based on the review of the ICR PDD/01/ and on-site inspection/4.6//4.7/, VVB confirms that the project includes restoration activities in degraded mangrove areas of Rahima Bay, along with planting of *Avicennia marina*. Therefore, the project meets the ICR requirement, ISO 14064-2/B01/ and the requirements of the baseline and monitoring methodology, AR-AM0014 v3.0/B02/. |

### 5.1.3 Project

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | After reviewing the supplementary document for anticipated project start date/06/ and onsite interview/4.6 with the representative of project proponent, the validation team has confirmed that the proposed ICR project is scheduled to commence on 16/04/2028. The project will begin with mangrove plantation activities, specifically focusing on *Avicennia marina*, in the designated region. |

#### 5.1.3.1 Eligibility criteria for grouped project

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Primary focus of project restoration efforts involves planting new mangrove saplings within designated areas comprising barren land parcels, degraded mangrove sites, and fragmented habitats. To safeguard the ecosystem with minimal disruption, our project exclusively prioritizes the use of *Avicennia marina*, one of the most common mangrove species/01//4.6/.<br>It has been confirmed by interviewing/4.6/ representative of project proponent and cross-referencing the KML files for project boundary/03/, that the project activity is not being developed as grouped project and/or with multiple project activities.<br>In line with the ICR requirement Document v5.0, section 5.1/B01/ and ICR template requirement the PDD/01/, VVB confirms that the project has been described appropriately and confirms that the proposed project is not being developed as project. |

[20] Carbonregistry.com

### 5.1.4 Location

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 01 has been raised and closed upon receipt of KML files delineating project boundary correctly. |
| Conclusion | VVB has reviewed the ICR PDD (section 1.3) for the physical location of the project and found the description in line with section 3.6 and 4.2 of the ICR requirement v5.0/B01/. The project is situated in the coastal regions of the Kingdom of Saudi Arabia, spanning along the Arabian Gulf. The region mainly focusses on Dammam DRT/01//4.6/:<br><br>**Latitude** \| **Longitude** \| **Area (hectares)**<br>26°26'13.40"N \| 50° 7'55.18"E \| Total geographical boundary: 16.9 ha. Potential area for plantation: 9.9 ha<br><br>VVB, based on the review of the geo-tagged KML files/03/ with the co-ordinates for the project and on-site inspection/4.7/, confirms that planned project activity and/or the project area is in the host country, Saudi Arbia. VVB, confirms that the project's geographical boundary has been correctly demonstrated in the ICR PDD/01/with information on GPS co-ordinates of the project boundary. |

### 5.1.5 Conditions prior to implementation

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 25 was raised and resolved. |
| Conclusion | As detailed under section 1.5 of the ICR PDD/01/, Conditions existing prior to the project initiation are the same as the baseline scenario, degraded mangroves.<br>Saudi Arabia's climate is predominantly desert, with extremely hot and dry summers and mild winters, receiving minimal annual rainfall, particularly apart from the southwestern semi-arid regions. The country undergoes extreme temperature variations, with summer temperatures in central regions ranging from 27°C to 43°C inland and slightly cooler temperatures along the coast. Winters are milder, with temperatures ranging from 8°C to 20°C in interior regions and 19°C to 29°C in coastal areas along the Red Sea/01//4.6/. The Arabian Peninsula receives minimal rainfall, averaging 50 mm/year along the Gulf coast, mostly during winter.<br><br>The Arabian Gulf's sediment primarily comprises carbonate deposits and airborne terrestrial sediments. Tidal currents play a pivotal role in sediment distribution along the coastline, affecting marine and coastal habitats.<br>Tides and the associated tide-generated currents are the most important dynamic physical process affecting sediment distribution and transportation along the shoreline of Abu Ali Island. The tides in the Saudi Arabian Gulf commonly range from semi-diurnal to highly mixed, even approaching a diurnal cycle at times.<br>Saudi Arabia confronts several environmental challenges, including:<br>• Contaminated Well Water: The contamination of well water poses significant risks to public health and the environment.<br>• Cement Plant Waste: Disposal and management of waste from cement plants contribute to land and air pollution. |

| | |
|---|---|
| | • Increased Emissions: There is a notable increase in sulfur dioxide and nitrogen oxide emissions, contributing to air quality degradation.<br>• Land Degradation and Desertification: Continuous land degradation and the process of desertification threaten the agricultural and natural landscapes of the country.<br>• Other Pollutants: Additional pollutants result in increased environmental risks and pollution levels.<br>• Oil spills and dispersants, climate change and sea level rise are some of the problems that affect the Gulf's region.<br><br>Through review of supplementary information on baseline conditions/10/ and inspection of the project site/4.7/, VVB confirms that the condition prior to project implementation in the region is as described in the ICR PDD/01/.<br>Based on analysis of periodic spectral signatures from 2014, 2018, and 2020/03/, using Sentinel-2 imagery, VVB confirms the appropriateness of statements regarding the conditions prior to project initiation. Project area within the project boundary exhibited degraded and fragmented mangrove vegetation, alongside barren land parcels. These conditions are attributed to a combination of environmental and anthropogenic factors, including but not limited to construction activities, tidal obstruction, groundwater extraction, and oil spills. |

### 5.1.6 Technology applied.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 02 was raised and closed after review of updated information on technologies planned to be employed under ICR project. |
| Conclusion | A detailed assessment of the technology and measures planned to be implemented under the ICR project has been provided in section 1.6 of the ICR PDD/01/. The following practices have been employed under proposed project/01///4.6//4.7/:<br>• Field monitoring – For regular monitoring of Vegetation Health and Biodiversity, Ecosystem Dynamics, Benthic Communities and Water Quality, within the project region.<br>• Laboratory analyses including Soil and Sediment Analysis, Water Quality Testing and Benthic Analysis of the subject mangrove ecosystem.<br>• Restoration techniques: To ensure long-term survival of mangrove seedlings, cultivating mangrove seedlings in nurseries under controlled conditions until they are robust enough to be transplanted to the restoration site. Further to ensure minimum possible soil disturbance PP has placed an SOP/07/ for transplanting and plantation of mangrove seedlings along with planned irrigation schedule to maintain plant health and hardening potential to thrive is the subject region.<br>• Advanced techniques for data analysis and monitoring:<br>- Eddy covariance tower to measure real-time carbon fluxes, including carbon dioxide (CO2) emissions and uptake.<br>- Remote sensing to assess the health and status of mangroves using satellite imagery. With the help of multispectral and hyperspectral sensors data collection on mangrove extent, density, and chlorophyll content extending to NDVI analysis and land cover assessment within project boundary.<br>- Soil modelling - RothC Model, Wetland DNDC Model, InVEST Model: To estimate the carbon sequestration potential of mangrove soils over time. |

| | |
|---|---|
| | • Data integration and analysis: All the above-mentioned field and/or lab assessments are analyzed to conclude health and carbon sequestration potential of subject mangrove ecosystem for further project planning.<br><br>Based on the on-site inspection/4.7/ of the project site, interviews/4.6/ literature review/09/, supporting document demonstrating standard operating procedures in place for project implementation and management/01//07/, VVB confirms that the technology and measures planned to be employed by the PP are appropriate and applicable for the designated project region.<br>VVB confirms that the information on technology and measures provided in section 1.5 of the ICR PDD/01/ appropriately describes the comprehensive approach involving multiple techniques and data sources applied in the project activity. |

### 5.1.7 Roles and responsibilities

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | ICR PDD section 1.7/01/, correctly demonstrates the roles and responsibility of the parties involved in the project implementation. Saudi Arabian Oil Co. (Saudi Aramco) is the Project Proponent and YADGREEN AGRICULTURE CO is the Listing representative. This has been further verified during on-site inspection/interviews/4.6//4.7/. |

#### 5.1.7.1 Project proponent(s)

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Based on the review of ICR PDD/01/ and confirmed during on-site inspection/interviews/4.6/, VVB checked the information provided by PP on "project proponent involved in the project", which is adequate and in line with the requirement of ICR project description template.<br>As described in the section 1.7.1 of the ICR PDD/01/, Saudi Arabian Oil Co. (Saudi Aramco) as project proponent is responsible for the project implementation. |

#### 5.1.7.2 Others involved in the project.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Based on the review of ICR PDD/01/ and on-site interviews/4.6/, VVB confirms that the information provided by PP in the section 1.7.2 of the ICR PDD/01/ on "other entities involved in the project" is adequate and in line with the requirement of ICR project description template. It has been confirmed that YADGREEN AGRICULTURE CO act as listing representative for the proposed project and is also responsible for documenting project details. |

### 5.1.8 Chronological plan/implementation

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As described in the section 1.8 of the ICR PDD/01/, the chronology of the project is as follows:<br>1. Start date: 16/04/2028. |

| | |
|---|---|
| | 2. Baseline Period: 5 years prior to implementation<br>3. Termination of the Project: 15/04/2058<br>4. Frequency of monitoring reporting, crediting period: 5 years<br>5. Validation and Verification activities: Validation (24/01/2024), 1st Verification (15/04/2029), 2nd Verification (15/04/2034), 3rd Verification (15/04/2039)<br><br>The chronological events and/or planning of the subject project has been assessed in line with ICR requirement v5.0/B01/, PP has provided the supplementary information in the ICR PDD for which detailed assessment has been provided under section 5.2 of this report. The ICR PDD/01/ appropriately describes the timeline planned for project implementation and is consistent with the ICR template requirement. |

### 5.1.9 Eligibility

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As per the section 3.3 of the ICR requirement document v 5.0/B01/,<br>"*All projects with a start date after 1. January 2013 are eligible for registration with ICR subject to conformity to other requirements. Projects with a start date before 1. January 2020 shall demonstrate historical additionality (section 4.4.1) from its implementation and continuance of additionality at validation*".<br><br>As per the discussion with the representative of the project proponent/4.6/, based on a comprehensive examination of planning and feasibility analysis and aligning with preparatory activities and funding cycles, the project start date is anticipated to be 16/04/2028/06/.<br>Based on the review of ICR PDD/01/, on-site inspection interviews/4.6//4.7/, and supplementary information (stakeholder consultation records and monitoring/operation SOPs in place)/04//07/, it has been confirmed that the project activity has been planned to contribute significantly towards afforestation and reforestation sector as per ICR criteria. Therefore, VVB has concluded that project activity aligns with the key impacts of afforestation and reforestation recognized by the ICR Program/B01/.<br><br>In line with the requirement of section 3.3.1 of the ICR guideline v5.0/B01/, the project has applied CDM approved methodology: AR-AM0014 v3.0/B02/. VVB, based on the review of the ICR PDD/01/, on-site inspection/interviews/4.6//4.7/ and review of ex-ante calculation spreadsheet/02/, confirms that the project activity adheres to the ISO 14064-2:2019 Standard and applied methodology AR-AM0014/B02/. It has been confirmed that the quantification, monitoring, and reporting of GHG emission removals has followed the requirement of applied methodology and associated applicable tools along with pertinent IPCC guideline.<br><br>The project aligns with methodology AR-AM0014, which focuses on GHG removal by sinks in above-ground and below-ground biomass. This methodology is specifically designed for afforestation and reforestation projects targeting degraded mangrove habitats. It meets critical applicability conditions, such as the land being a degraded mangrove habitat and planting with mangrove species in project scenario ensuring minimum possible disturbance to soil. VVB has provided detailed assessment of project eligibility under applied methodology under section 5.4.2 of this report. |

| | |
|---|---|
| | Based on the review of the ICR PDD[/01/], physical inspection of project site[/4.7/], supplementary information[/10/], VVB assessment under sub-step 1a., it has been validated that the project area is subjected to degraded mangrove habitat along with presence of some barren land parcels.<br>Considering the overall review of project description[/01/] and the supporting evidence[/02//04//07//08/], VVB confirms that the proposed project is eligible to generate additional, real, and transparent net positive GHG mitigations in the region. Therefore, project activity has been found to be eligible for registration with ICR program. |

### 5.1.10 Funding

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As per the ICR PDD[/01/], the ICR project is a self-funded project, which does not expect a financial outcome, but is executed as a part of the commitment towards the environment. The same has been confirmed through conversing with the representative of the project proponent (Saudi Aramco)[/4.6/], the project has not received any public funding and is planned to be implemented with its own financial resources. |

### 5.1.11 Ownership

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 16 was raised and resolved upon receipt of concession agreement. |
| Conclusion | As per the section 1.11 of ICR PDD[/01/], The project area consists of coastal lands that are owned by the Kingdom of Saudi Arabia. Saudi Aramco, the project proponent, has obtained a concession agreement with the Ministry of Petroleum and Mineral Resources, granting them the legal authority to manage and operate the project activities associated with their business. This agreement has been in place since 1968 and has an indefinite duration.<br>Based on the review of the ICR PDD[/01/], onsite inspection/interview[/4.6/], and review of the concession agreement in place (concession agreement-Arabic)[/05/], VVB has confirmed that the "Ministry of Petroleum and Mineral Resources", Riyadh has awarded Saudi Aramco (the project proponent), a concession agreement, authorizing them to access and oversee the designated project area and execute project-related activities since 1968 indefinitely.<br>Further as per the supplementary document (credit ownership - DD SWAM-scan)[/05/] signed between Saudi Aramco and Yadgreen Agriculture Co.; Saudi Aramco entered into a formal agreement with Yadgreen for the execution of the DD-SWAM project. Per this agreement Yadgreen is expected to provide technical expertise and assistance in project implementation, whereas Saudi Aramco retains full ownership of the project outcomes, including carbon credits generated.<br>Therefore, VVB confirms that the project ownership described aligning with the requirement of section 3.7 of the ICR document v5.0[/B01/]. |

### 5.1.12 Other certifications

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |

| | |
|---|---|
| Conclusion | This project has not sought nor received another form of GHG-related environmental credits. This has been confirmed by checking on other GHG program/registries (CDM/GS/GCC/Plan Vivo)/B03/ and has been verified by reviewing the declaration/08/ that the project and/or project participants is/are not seeking registration under other GHG program. |

### 5.1.13 Double counting, issuance and claiming.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 18 was issued and resolve later after receiving the declaration from PP. |
| Conclusion | This project has neither applied for nor been rejected from any other GHG programs. This has been confirmed by checking on other GHG program/registries (CDM/GS/GCC/Plan Vivo)/B03/ and has been verified by reviewing the declaration/08/ that the project and/or project participants is/are not seeking registration under other GHG program. |

#### 5.1.13.1 Double counting, issuance and claiming.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 18 was issued and resolve later after receiving the declaration from PP. |
| Conclusion | This project has neither applied for nor been rejected from any other GHG programs. This has been confirmed by checking on other GHG program/registries (CDM/GS/GCC/Plan Vivo)/B03/ and has been verified by reviewing the declaration/08/ that the project and/or project participants is/are not seeking registration under other GHG program. |

#### 5.1.13.2 Double claiming and other instruments

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 18 was issued and resolve later after receiving the declaration from PP. |
| Conclusion | This project has neither applied for nor been rejected from any other GHG programs. Also, project activities also not included in a GHG emissions trading program or subject to binding emission limit. This has been confirmed by checking on other GHG program/registries (CDM/GS/GCC/Plan Vivo)/B03/ and has been verified by reviewing the declaration/08/ that the project and/or project participants is/are not seeking registration under other GHG program. |

### 5.1.14 Other benefits

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 05 was issued and resolve later after updated information has been provided for SDG contribution. |
| Conclusion | As described in the section 1.14 of the ICR PDD/01/, project activity expect to contribute towards the following sustainable development goals, and PP has employed specific monitoring/reporting process for each SDG and/or SDG indicators/01//4.6/: |

| SDG Target | SDG target & Indicator | Contributions Over Project Lifetime |
|---|---|---|
| SDG 13: Climate Action | 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters. | Enhancing coastal resilience against climate impacts, reducing vulnerability to storms and flooding. |

| | | |
|---|---|---|
| | *"Presence of disaster risk reduction strategies that include ecosystem-based approaches with a focus on mangroves".* | |
| SDG 14: Life Below Water | 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.<br><br>*"Reduction in marine pollution measured by concentrations of pollutants in water bodies."* | Reducing runoff and filtering pollutants, thus improving water quality. |
| | 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration to achieve healthy and productive oceans.<br><br>*"Proportion of national exclusive economic zones managed using ecosystem-based approaches"* | Restoring mangrove habitats contributes to the health and productivity of coastal and marine ecosystems. |
| | 14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information.<br><br>*"Coverage of protected areas in relation to marine areas."* | Expanding the area of mangrove forests under protection contributes to marine biodiversity conservation. |
| SDG 15: Life on Land | 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.<br><br>*"Forest area as a proportion of total land area"* | Increasing mangrove coverage helps in conserving terrestrial ecosystems and their biodiversity. |
| | 15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.<br><br>*"Change in the status of threatened species by conserving their habitats."* | Protecting and restoring mangrove habitats aids in the conservation of threatened and endangered species. |
| | 15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.<br><br>*"Proportion of countries integrating the values of ecosystems and biodiversity into planning and development processes."* | Mangrove restoration projects demonstrate the integration of ecosystem values into development and conservation planning. |

VVB, based on the review of project PDD[/01/] and on-site inspection/interviews[/4.6//4.7/], confirms that the purpose of the project activity is to restore and revegetate the fragmented mangrove habitat within the project boundary through planting locally common mangrove species i.e., *Avicenna marina*. The project is aiming to increase mangrove cover of the subject area and thereby enhancing the carbon sequestration potential in the region.

| | |
|---|---|
| | VVB, based on the review of project description[/01/], supplementary information (project's monitoring plan [/01/], plantation, and monitoring SOPs in place to ensure successful plantation and long-term survival of mangrove seedlings[/01//07/]) and on-site inspection/interviews[/4.6//4.7/], confirms that the information on anticipated SDG contributions from the project have been correctly quoted and is in line with the ICR guideline[/B01/]. |

### 5.1.15 Host country attestation.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Not Applicable |

### 5.1.16 Additional information

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Not Applicable |

### 5.1.17 Confidential/sensitive information

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Based on the review of the ICR PDD[/01/] and supporting documents[/02-10/] VVB confirms that all the information provided (except project ownership records) in the ICR PDD[/01/] is publicly available. |

## 5.2 Crediting

### 5.2.1 Project start date

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 07 was issued and resolved. |
| Conclusion | As described in section 2.1 of PDD[/01/], the identified start date of the project is 16/04/2028, which will be the day when the activity that led to GHG emission mitigation has been implemented (i.e., conservation activities for mangroves will be initiated.)<br><br>Per discussion with the project participant (Yadgreen), VVB has ascertained that the selection of April 16, 2028, as the start date for the project is the outcome of comprehensive project planning and feasibility analysis. This strategically chosen date allows the completion of all essential preparatory and groundwork activities, including the acquisition of necessary permits, finalization of project design, financial closure, and a thorough evaluation of previous mangrove restoration efforts, while also aligning with fiscal year and funding cycles to ensure optimal resource allocation.<br>Therefore, VVB confirms that project start date identified by PP, is following section 3.4.1 of the ICR requirement document v5.0[/B01/]. |

### 5.2.2 Expected operational lifetime or termination date.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As per section 3.4.2 of ICR requirement v5.0[/B01/]. |

| | |
|---|---|
| | *"Crediting period for projects with a start date after 1. January 2021: For project activities involving CDR, a crediting period of a maximum of 15 years or a conservative estimate of the technical lifetime of the installed technologies or implemented measures and associated impacts. The crediting period is renewable a maximum of twice".*<br><br>As described in section 2.1 of ICR PDD/01/, The lifetime of the project "Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)" has been set as 30 years (First crediting period of 15 years renewable again for 15 years making 30 years in total). VVB has reviewed the relevant supporting evidence and/or agreement (credit ownership - DD SWAM-scan .pdf)/05/ and finds that the overall technical lifetime of the project activity as indicated above will remain functional. Therefore, it has been confirmed that the project follows the ICR requirement. |

### 5.2.3 Crediting period

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 07 was issued and resolved. |
| Conclusion | Following section 3.4 of the ICR requirement document v5.0/B01/, the crediting period identified for the proposed ICR project is 30 years starting from 16/04/2028 to 15/04/2058/01//4.6/.<br>VVB confirms that the project area is safeguarded by a binding agreement/05/ of PP with the Ministry of Petroleum and Mineral Resources (Riyadh), providing them with the legal mandate to oversee and conduct project activities aligned with their business objectives beyond the project's technical lifespan. This authorization ensures the continuation of management practices aimed at preserving carbon stocks throughout the project's crediting period. Consequently, VVB confirms the project's sustained viability over the entirety of the crediting period. |

### 5.2.4 Calander year of crediting

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Per ICR PDD/01/, project crediting period has been indicated as 30 years. |

| Calendar year of crediting | Estimated GHG emission mitigations (t CO2-e) |
|---|---|
| 16 /04/2028 to 31 December 2028 | 0 |
| 1 January 2029 to 31. December 2029 | 14 |
| 1 January 2030 to 31. December 2030 | 23 |
| 1 January 2031 to 31. December 2031 | 32 |
| 1 January 2032 to 31. December 2032 | 41 |
| 1 January 2033 to 31. December 2033 | 50 |
| 1 January 2034 to 31. December 2034 | 59 |
| 1 January 2035 to 31. December 2035 | 68 |

| | |
|---|---|
| 1 January 2036 to 31. December 2036 | 77 |
| 1 January 2037 to 31. December 2037 | 86 |
| 1 January 2038 to 31. December 2038 | 95 |
| 1 January 2039 to 31. December 2039 | 104 |
| 1 January 2040 to 31. December 2040 | 113 |
| 1 January 2041 to 31. December 2041 | 123 |
| 1 January 2042 to 31. December 2042 | 132 |
| 1 January 2043 to 31. December 2043 | 141 |
| 1 January 2044 to 31. December 2044 | 150 |
| 1 January 2045 to 31. December 2045 | 159 |
| 1 January 2046 to 31. December 2046 | 168 |
| 1 January 2047 to 31. December 2047 | 177 |
| 1 January 2048 to 31. December 2048 | 186 |
| 1 January 2049 to 31. December 2049 | 195 |
| 1 January 2050 to 31. December 2050 | 204 |
| 1 January 2051 to 31. December 2051 | 213 |
| 1 January 2052 to 31. December 2052 | 222 |
| 1 January 2053 to 31. December 2053 | 231 |
| 1 January 2054 to 31. December 2054 | 241 |
| 1 January 2055 to 31. December 2055 | 250 |
| 1 January 2056 to 31. December 2056 | 259 |
| 1 January 2057 to 31. December 2057 | 268 |
| 1 January 2058 to 15 April 2058 | |
| Total | 4357 |
| **Total number of years (yrs)** | 30 |
| **Annual average (t CO2-e)** | 145 |

| | |
|---|---|
| | VVB, confirms that the project proponent has correctly provided calendar year wise/vintage wise projection for net GHG mitigations generated from the project activity. |

## 5.3 Safeguards

### 5.3.1 Statutory requirements

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 19 was raised and resolved after revision in ICR PDD. |
| Conclusion | The project proponent, Saudi Aramco, follows strict environmental rules and regulations in Saudi Arabia to protect mangroves and tidal ecosystems. These rules come from the government, Saudi Aramco, and other stakeholders. There's a special committee with representatives from the mangrove and forestation division of ARAMCO that oversees changes to the ecosystem in these areas. This rigorous oversight ensures that the project minimizes harm to the environment and keeps the mangroves safe. By following these regulations and conducting Environmental Impact Assessments, the project aims to prevent damage and promote sustainable development[/01//4.6/].<br>VVB has crosschecked the following regulations:<br>• General Environmental Regulation[21]<br>• Restructuring for Environmental Governance[22]<br>• Vision 2030 and the Saudi Green Initiative[23]<br>• Compliance with International Environmental Agreements[24]<br>• Ramsar Convention on Wetlands[25]<br>• United Nations Convention on Biological Diversity (CBD)[26]<br>• United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement<br>• Basic Law of Governance (Royal Decree No. A/90)[27] : Article 32: The State shall work towards the preservation, protection, and improvement of the environment, as well as prevent pollution.<br>• The Environmental Law (Royal Decree No. M/34)[28]: Enacted in 2001, this law establishes the legal basis for environmental protection and conservation in Saudi Arabia. It addresses various environmental issues, including air and water pollution, waste management, and biodiversity conservation. It provides a general framework for environmental management, which includes measures relevant to combating desertification and preserving vegetation cover.<br>- This also include the "National Environment Strategy of Saudi Arabia"[29], outlining the country's environmental priorities and goals, including those related to desertification control and vegetation cover enhancement. It |

[21] Saudi Arabia's 2021 Environmental Regulatory Reforms – Part 1 | WKC Group
[22] The General Authority of Meteorology and Environmental Protection (mewa.gov.sa)
[23] Saudi Green Initiative - (vision2030.gov.sa)
[24] Environmental Laws in Saudi Arabia | Derayah LLPC (saudilegal.com)
[25] The Ramsar Convention on Wetlands - DCCEEW
[26] Convention on Biodiversity | United Nations
[27] https://www.saudiembassy.net/basic-law-governance
Ministry of Environment, Water, and Agriculture (MEWA). (2001). Environmental Law (Royal Decree No. M/34): https://www.mewa.gov.sa/en/InformationCenter/DocsCenter/RulesLibrary/Docs/Environmental%20Law.pdf
[29]https://www.mewa.gov.sa/en/Ministry/initiatives/SectorStratigy/Documents/6.%20BAH-MEWA-KSA%20NES-CEDA%20Executive%20Summary%20v3%2020180221%20ENG.pdf

| | |
|---|---|
| | provides guidance for the development of policies, regulations, and action plans to address environmental challenges.<br>- Ministerial Resolutions and Regulations: The Ministry of Environment, Water, and Agriculture (MEWA) issues specific regulations and resolutions to implement environmental laws and policies. These may include regulations addressing vegetation cover, reforestation programs, soil conservation measures, and other initiatives related to combating desertification.<br><br>VVB, confirms that there are no contradicting laws the proposed project activity exists in the territory covering the project area, which is found based on the on-site inspection/interviews/4.6//4.7/, and independent research. The project follows all applicable legal and regulatory requirements regarding carbon sequestration associated with the degraded and/or fragment mangrove land. |

### 5.3.2 Potential negative environmental and socio-economic impacts

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 08 was raised and resolved after revision in ICR PDD. |
| Conclusion | As described in the section 3.2 of the PDD/01/, it is expected that during project implementation and/or mangrove plantation in the project area there may arise some negative impacts on the ecosystem of the region. The risk identified by PP are as follows/01//4.6/:<br>• Introduction of Invasive Species: The risk of inadvertently introducing invasive species alongside the plantation of *Avicennia marina* could disrupt the existing ecosystems, outcompeting native species and altering habitat structures.<br>• Impact on Local Flora and Fauna: The activities associated with mangrove restoration, including land preparation and the establishment of nurseries, might temporarily disturb the habitats of indigenous wildlife, impacting species that rely on the existing conditions.<br>• Ecological Imbalance: Increasing the density of *Avicennia marina* without considering the ecological balance could lead to dominance that might suppress the growth of associated biodiversity, potentially reducing the ecosystem's resilience and complexity.<br>As per project PDD/01/, further confirmed during on-site interviews/4.6/, to mitigate any possible risk sue to project activity to the environment of the project region, following steps are planned to be employed:<br>• Comprehensive Environmental Impact Assessments (EIA): Before initiating the project, conducting thorough EIAs wherever required will help identify potential adverse effects on the environment.<br>• Responsible Sourcing and Quarantine of Seedlings: To prevent the introduction of invasive species, it is crucial to source *Avicennia marina* seedlings responsibly. This includes inspecting for pests and diseases that could spread to the local environment.<br>• Adaptive Management and Monitoring: Establish a robust ecological monitoring program to observe the health of the planted mangroves and their impact on local biodiversity. This data-driven approach allows for adjustments in planting strategies and management practices to mitigate unforeseen ecological impacts.<br>• Promoting Biodiversity: While focusing on *Avicennia marina*, ensure that the plantation design includes measures to maintain or enhance biodiversity. This |

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|---|---|
| | might involve integrating other supporting habitat structures that benefit a different range of species.<br><br>VVB based on the desk review of project description/01/ and peer reviewed literature/reference/09/, confirms that the potential risks identified by project participant are pertinent to mangrove plantation and restoration activities in the subject region. The anticipated risks can potentially have negative environmental consequences, including altering hydrology, species displacement, the introduction of invasive species, changes in water quality, resource conflicts, impact on local flora and fauna, ecological imbalance, and long-term sustainability challenges.<br><br>To mitigate these impacts, PP has planned to conduct thorough environmental impact assessments/4.6/, project management, and monitoring, and follow best practices for restoration, while considering the interconnected nature of ecosystems to ensure that the benefits of mangrove conservation and restoration outweigh the drawbacks.<br>VVB, has observed that the PP has evaluated and has addressed all the possible environmental risks that may have arisen due to implementation of project activity in the region. VVB has confirmed the same through onsite interview with project personnel/4.6/, review of SOPs/07/ in place: for "Seedling establishment and survival", SOP for planting of *Avicennia marina*/01- Appendix/, "Field monitoring protocol and staff training".<br>Furthermore, project participants do not expect any negative impact on socio-economic conditions within the project boundary as the project area is devoid of any local community. The assumption is based on the fact that project area is under control of Saudi Aramco per concession agreement/05/, which confirms that only project proponent has the right to access of land resources of project area. Additionally, during on-site inspection/4.7/, VVB has observed that the project area is free from any human-habitation, and thus confirms the assumption to be correctly quoted. |

### 5.3.3 Consultation with interested parties and communications

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|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 09 was raised and resolved after revision in ICR PDD. |
| Conclusion | As per the project PDD/01/ and confirmed by reviewing the supplementary document/04/, the primary focus of the stakeholder consultation was to discuss the necessity of implementing a project in the context of the current climate change scenario.<br>VVB, based on the on-site interviews/4.6/ with the representatives of project proponent and participating stakeholders/4.6/, finds that all parties involved have been conversed with about the purpose of project activity and the expected impacts it will have in the region. Therefore, VVB confirms that PP has followed ICR guideline to ensure engagement of pertinent stakeholder identified for the subject project activity. |

#### 5.3.3.1 Stakeholders and consultation

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 09 was raised and resolved after revision in ICR PDD and receipt of supplementary information on stakeholder consultation. |
| Conclusion | As per supporting evidence (stakeholder consultation report)/04/, the virtual stakeholder consultation took place via skype platform on 25/09/2022 with the members of Mangrove and Forestation Division of Saudi Aramco with following agenda: |

- Welcome and introduction.
- Overview of the Mangrove Conservation Project: Highlighting the importance of mangroves in climate change mitigation.
- Presentation of the Non- Technical Summary: Including following particulars:
  - Purpose and objective of proposed project activity and role of mangroves in enhancing carbon sequestration potential in the region.
  - Geographical as well as temporal boundary of the project.
  - Projects approach and/or strategies to achieve project activities.
  - Project's safeguard principles
  - Contributions towards sustainable development.
- Question-Answer Session: Focus mainly of monitoring methodology and remote sensing approach to be applied, access to project area, analysis of project impact on environment, long-term sustainability of the project.
- Way forward and Continuous Input Mechanism: To ensure continuous stakeholder input PP has employed a Grievance Addressal Process/04/ with following steps:
  - Submission of grievance through mails of representatives of Saudi Aramco (Tamer.mutari.2@aramco.com) and Yadgreen Agriculture Co. (gm@yadgreen.com).
  - Acknowledgement of receipt: Within 15 business days of receipt.
  - Evaluation and investigation: Within 15 days from grievance acknowledgement.
  - Resolution of response: Within 5 days from investigation completion.
  - Feedback and Closure: Upon agreement from complainant the grievance will be considered resolved and formally closed.
  - Records of grievance received and resolved.
- Closing Remarks
- Networking and Informal Discussions.

VVB based on the on-site interviews/4.6/ with the representatives of project proponent and participating stakeholders, finds that a virtual stakeholder consultation has been held for the project activity on 25/09/2022 and 30 members participated including, primarily of employees and departments within Saudi Aramco, specifically the Ras Tanura Producing Department (RTPD) and the Northern Area Oil Operation (NAOO) Organization, along with the Environmental Protection (EP) department and members from the Yadgreen Agriculture Co.

Ongoing consultation mechanisms include regular engagement with EP to enhance the ecological impact of the mangroves, planning visitor facilities, and auditing seedling survival rates. Adaptive management plans involve regular monitoring, evaluations, and stakeholder meetings facilitated by the GE & EPD, ensuring the project's success and sustainability. Stakeholder consultations included meetings developed by EP with RTPD and NAOO, with a working team consisting of representatives from these departments. Discussions covered project implementation, environmental impact, and roles in the project/4.6/.

VVB based on the review of the "Stakeholder Consultation Report"/04/, confirms that description provided in section 3.3.1 of ICR PDD/01/ is the transparent and valid reflection of actual stakeholder engagement process employed by PP and is in accordance with the ICR guideline v5.0/B01/. Furthermore, PP has employed an on-going communication

| | |
|---|---|
| | mechanism to keep in place a grievance redressal channel[/05/] to address future opinions of stakeholders on project activity.<br>Based on the reviewed documents, site visit and interviews, validation team confirms that in accordance with the ICR requirements v.5.0[/B01/], PP has performed consultations with identified relevant stakeholders and has established an ongoing communication mechanism with interested parties during. The communication details have been described elaborately in the Local stakeholder consultation report[/05/]. Further the comments/feedback received have been adequately incorporated in the project design. |

#### 5.3.3.2 Public comments

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 11 was raised and resolved. |
| Conclusion | As per the on-site interviews with the project personnel[/4.6/], The public comment period for the mangrove restoration project was officially opened on 21/10/2023 (following the stakeholder meeting). The period remained open for 30 days, concluding on 21/11/2023. Even though there were no comments raised, there were certain queries raised, which are communicated to ICR registry following instruction in as per section 10.4 of the ICR process requirements 5.0[/B01/]. The public comment period was informed directly to the departments involved in the stakeholder engagements in connection with mangrove restoration project.<br><br>VVB has reviewed the project page (https://www.carbonregistry.com/explore/projects/damm-am-dr-137/versions) on ICR registry and confirms that the proposed project has not received any public comments during the reported public comment period. |

### 5.3.4 Environmental impact assessment (EIA)

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 04 was raised and resolved after revision in ICR PDD. |
| Conclusion | Since the implemented conservation activities within the region are completely environmentally friendly, additional EIAs are not required. However, per project proponent's commitment to ensure net positive impact of project activity on environment of project region, PP anticipate to conducted EIA if necessary. The same has been confirmed from onsite interviews[/4.6/].<br><br>As per the Environmental Act No. 193 of 2001 of Saudi Arabia (promulgated by Royal Decree No. M/34 of 2001 to protect the environment, society, and promote sustainable development of natural resources), *"The law requires that environmental assessment studies be conducted at the feasibility stage for all projects with potential adverse impacts on the environment, per the specified principles and standards".*<br><br>This legislation aims to regulate various activities that may have an impact on the environment, such as industrial operations, waste management, and land use. It sets standards for environmental protection, establishes procedures for environmental impact assessments, and outlines penalties for non-compliance with environmental regulations.<br><br>However, as the project aims to restore the native ecosystem in the subject region through mangrove plantation activities, VVB confirms that Environmental Impact Assessment is not applicable for the proposed project. |

| | |
|---|---|
| | Further as described under section 3.1 of the ICR PDD: "The project is conducted within the framework of the Saudi Arabian Environment Law (Royal Decree No. M/165 of 2020), which mandates environmental protection and promotes sustainable usage practices. It further complies with the National Strategy for the Conservation of Biodiversity, emphasizing both in-situ and ex-situ conservation efforts, and aligns with the objectives of the Saudi Green Initiative aimed at reducing emissions, advancing afforestation, and safeguarding terrestrial and marine habitats". Therefore, VVB confirms that the project activity is being carried out in accordance with the requirement of the "Environmental Rules and Regulation" of the host country. |

### 5.3.5 Risk assessment.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | In section 3.5 of the ICR PDD[/01/], PP has outlined the most likely risks factors that may affect project's long-term viability. The risk identified and the mitigation measure in place area as follows: |

| Risk Identified | | Mitigation measures |
|---|---|---|
| Sea-Level Rise (SLR) | Could lead to habitat loss and affect mangrove health | Elevate planting areas to adapt to rising sea levels; Regular monitoring of sea-level changes and adaptation plans. |
| Waterlogging and Salinity | Impacts mangrove growth and soil quality | Implement drainage systems to mitigate waterlogging; Regular soil testing to monitor salinity levels. |
| Oil Spills | Can cause significant damage to mangrove ecosystems | Establish contingency plans for immediate response to spills. |
| Natural Disasters (e.g., Storms, Cyclones) | Potential damage to mangrove habitats | Plant mangroves in staggered/tiered manner; Reinforce coastal defences. |
| Invasive Species | Disrupts ecological balance and native species growth | Implement monitoring and control measures; Promote growth of native mangrove species. |
| Climate Change-Related Stressors | Affects mangrove resilience and adaptability | Choose resilient mangrove species; Implement adaptive management practices. |
| Infrastructure | Can disrupt natural mangrove growth and water flow | Avoid further constructions within mangrove habitats; Plan infrastructure carefully. |
| Waste Effluents | Pollution risk to the mangrove ecosystem | Ensure no effluent discharge goes untreated into mangrove habitats or natural water sources. |

VVB, confirms that PP has correctly identified the possible risks that me negatively affects the project activity such as natural disasters, invasive species, oil spills, disease outbreaks, waste effluents, climate change-related stressors, waterlogging and salinity,

| | |
|---|---|
| | human disturbance, community conflicts, resource scarcity, changing local regulations, and monitoring/reporting. To mitigate these risks, the project employs strategies like coastal protection against natural disasters, invasive species monitoring, oil spill response plans, mangrove health assessments, temperature control measures, community engagement, diversified funding sources, adaptation to changing regulations, and a robust monitoring and reporting system. The same was also confirmed by VVB after onsite interviews/4.6/. |

#### 5.3.5.1 Additional information on risk management

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | The PP has demonstrated a SWOT analysis of the proposed mangrove restoration/revegetation project in section 3.5.1 of the ICR PDD/01/, enabling stakeholders to develop informed strategies for enhancing GHG emissions mitigation in mangrove conservation and restoration efforts.<br>VVB, based on the onsite interviews/4.6/, confirms that to mitigate the risks identified, the project proponent has planned to employ strategies like coastal protection against natural disasters, invasive species monitoring, oil spill response plans, mangrove health assessments, temperature control measures, community engagement, diversified funding sources, adaptation to changing regulations, and a robust monitoring and reporting system. Hence, the description provided in the PDD/01/ is valid and acceptable for the VVB. |

## 5.4 Methodology

### 5.4.1 Reference to the applied methodology and applied tools

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | The project has applied CDM Methodology/01//4.6/: AR-AM0014: "Afforestation and reforestation of degraded mangrove habitats v3.0/B02/ to quantify GHG emission removals achieved from project activity in addition to this ISO: 14064-2 :2019 methodology has been applied for project monitoring and reporting.<br><br>VVB confirms that the above-mentioned methodology has been correctly referenced for the project activity and found to be valid and applicable in accordance with the guideline of ICR program and ISO 144064-2/B01/. Furthermore, the references to the versions of methodologies and tools were found to be correct and valid for use.<br>The applied CDM tools includes the following:<br>• AR-Tool 02 - Combined tool to identify the baseline scenario and demonstrate additionality in A/R CDM project activities v1.0.<br>• AR-Tool 12- Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities v3.0.<br>• AR-Tool 14- Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities v4.1.<br>• AR-Tool 17-Demonstrating appropriateness of allometric equations for estimation of aboveground tree biomass in ARR CDM project activities v1.0.<br>• AR-Tool 03- Calculation of the number of sample plots for measurements within A/R CDM project activities v2.1. |

### 5.4.2 Applicability of methodology

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Applicability criteria for the baseline and monitoring methodology have been assessed by the validation team by means of document review and interview. VVB team confirms that the project activity meets the criteria of the applied methodology.<br>Following the applied methodology AR-AM0014 v3.0/B02/, applied tools/B02/, VVB has summarized the process incorporated to assess the project applicability against relevant requirements as below: |

AR-AM0014 v3.0: "Afforestation and reforestation of degraded mangrove habitats v3.0/B02//B02/

| S. N. | Applicability Condition | PP Justification | VVB assessment |
|---|---|---|---|
| A | The land subject to the project activity is degraded mangrove habitat; | The ARR project area using AR-AM0014 is identified as degraded mangrove habitat. The land considered for the project activity is a degraded mangrove habitat. Currently, it is non-vegetated; however, in its natural state, mangrove vegetation could grow due to the presence of sediment, tidal water and other suitable conditions like matured to degraded mangroves in the adjacent regions." The adjacent mangrove ecosystems are currently in a state of decline. The region is experiencing a eutrophication that have been happening two years back which is then stopped. Due to the high nutrients in the soil there is an increased growth rate, however which is not healthy enough to withstand the environmental stresses like salinity or drought. | The project includes the plantation of mangrove species i.e., *Avicennia marina* in degraded mangrove habitat within Dammam region of Saudi Arabia.<br><br>Photographs of project area submitted by project's listing representative to indicate present/baseline conditions of the project area and/or mangrove habitat/10/.<br><br>VVB has further carried out its own analysis utilizing NDVI calculations derived from Sentinel-2 imagery of project area and confirmed that the potential area for plantation identified under proposed project is as described in the ICR PDD/01/ and consists of complex of degraded mangrove vegetation (fragmented mangroves) along with barren land parcels.<br><br>Therefore, VVB confirms that the project meets the applicability condition. |
| B | More than 90 per cent of the project area is planted with mangrove species. If more than 10 per cent of the project area is planted with non-mangrove species, then the project activity does not lead to | The degraded mangrove area will be planted with mangrove species. The project area is fully planted with mangrove species, specifically the native species *Avicennia marina*. The only project activity is propagule planting and conservation measures. There is no anthropogenic interventions or direct activities like drainage, | Based on the review of ICR PDD/01/, on-site inspection interviews/4.6//4.7/, and supplementary information (stakeholder consultation records and monitoring/operation SOPs in place)/04//07/, it has been confirmed that the project activity has been planned to plan mangrove species |

| | | | |
|---|---|---|---|
| | alteration of hydrology of the project area and hydrology of connected up-gradient and down-gradient wetland area; | digging etc that causes the alteration of the hydrology. | *Avicennia marina* in the project area. Thereby meets the applicability condition. |
| C | Soil disturbance attributable to the A/R clean development mechanism (CDM) project activity does not cover more than 10 per cent of the area. | Soil disturbance is not expected as soil preparation will not be necessary, and planting activities will be conducted manually rather than through automated processes. Therefore, the likelihood of any kind of soil disturbance is negligible. | VVB has reviewed the SOP in place for mangrove planting and seedling establishment in the project area/07/. The SOPs emphasize on eco-friendly method of site preparation to ensure minimum possible damage and/or disturbance to soil.<br>Further PP has planned to apply mulching and organic composting to improved soil health and fertility. Hence, VVB confirms that the project has been designed to keep soil disturbance to lowest possible levels and meets the applicability condition. |
| **CDM Tool: "COMBINED TOOL TO IDENTIFY THE BASELINE SCENARIO AND DEMONSTRATE ADDITIONALITY IN A/R CDM PROJECT ACTIVITIES"/B02/** | | | |
| 1 | Forestation of the land within the proposed project boundary performed with or without being registered as the A/R CDM project activity shall not lead to violation of any applicable law, even if the law is not enforced. | The project activities are in compliance with applicable legal and regulatory requirements. | VVB, confirms that there are no contradicting laws the proposed project activity exists in the territory covering the project area, which is found based on the on-site inspection/interviews/4.6//4.7/, and independent research (described under section 5.3.1 and 5.3.4 of this report). The project follows all applicable legal and regulatory requirements regarding carbon sequestration associated with the degraded and/or fragment mangrove land. |

Considering the confirmation of all the above-mentioned applicability conditions of the applied methodology AR-AM0014 v3.0/B01/, VVB confirms that the project activity follows the respective requirements, thus has been implemented following valid and acceptable project design.

### 5.4.3 Deviation from applied methodology

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |

| | |
|---|---|
| Conclusion | The Project has been developed according to the methodology described above and no deviation is taken from the methodology. |

### 5.4.4 Other information relating to methodology application.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Project has been designed completely in accordance with AR-AM0014 v3.0[/B02/]. |

## 5.5 Additionality

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Based on the review of the project description[/01/] and on-site inspection/interviews[/4.6//4.7/] on baseline assessment and additionality, VVB confirms that the project design description represents a net environmental benefit and real mitigation of GHG emissions what would have been achieved in baseline scenario.<br>Project additionally has been demonstrated in accordance with the ISO- 14064 -2: 2019 and ICR requirement v5.0[/B01/]. The approach followed is valid and acceptable for the VVB. |

### 5.5.1 Level 1 - ISO 14064-2 GHG emissions additionality

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As per the section 5.1 of the PDD[/01/]:<br>The project qualifies as GHG Emissions Additional under ISO 14064-2, as it is designed to result in a net GHG removals beyond what would have occurred in the absence of the project. The rationale for GHG emissions additionality is based on project objectives, Baseline Scenario Assumption, Conclusion of Additionality.<br>VVB has confirmed level 1 additionality of the project by reviewing the information on identification baseline scenario[/10//3.2/], and through performance analysis between baseline emissions and the net GHG emission mitigation contributions/projected for the proposed project activity. The total estimated GHG emission removals from the project are 4,357 $tCO_2e$ over the crediting period of 30 years with an annual average of 145 $tCO_2e$. VVB confirms that the GHG removals would not have occur in the absence of the project activity in the region. |

### 5.5.2 Level 2a – Statutory additionality.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | This mangrove restoring project is considered Statutory Additional, as defined by the International Carbon Registry's standards for Level 2a additionality. The project scenario goes beyond the relevant statutory requirements in the host country, Saudi Arabia, due to the following reasons[/01/]:<br><br>• In an arid country like Saudi Arabia, where mangroves play a vital role in providing essential services, regulatory measures specifically targeting the conservation and restoration of these ecosystems are notably scarce. Existing regulations, where present, lack consistent enforcement, and stakeholders may encounter challenges in accessing significant incentives, legal support, or financial assistance to |

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|---|---|
| | implement such measures. Importantly, these regulations do not explicitly focus on greenhouse gas (GHG) mitigation and sequestration. There are no statutory frameworks that solely focus on coastal ecosystems, mangroves, or carbon sequestration, as indicated by available legal resources in the country.<br>• As there is no framework that currently exists. In this context, the project's practices surpass the legal requirements, aligning with the criteria of Statutory Additionality.<br>Through checking on relevant web portals (described under section 5.3.1 of this report) it has been confirmed that the project satisfies Level 2a additionality under statutory additionality. |

### 5.5.3 Level 2b – Non-enforcement additionality.

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As per the section 4.4.1 of ICR requirement v5.0[/B01/]:<br>*"Level 2b additionality – non-enforcement additionality Projects are non-enforcement additional if their implementation and/or operation is subject to statutory requirements that are systematically not enforced and where non-compliance with those requirements is widespread in the host country".*<br>VVB confirms that the ICR PDD[/01/], demonstrates the level 2b additionality appropriately. PP has described the non-enforced statutory regulations of the host country. Due to the current lack of statutory regulations, the concept of non-enforcement additionality is not applicable for the project activity.<br>However as per the ICR PDD[/01/] and discussion with representatives of PP, the project goes beyond the existing legal demands, making itself extra and setting the stage for the possible development of a statutory framework. |

### 5.5.4 Level 3 – Technology, institutional, common practice additionality

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Following the ICR requirement v5.0[/B01/], PP has demonstrated level 3 additionality of the project as described in section 5.4 of ICR PDD[/01//4.6/]:<br>**Barriers identified.**<br>- Technological barrier: The lack of knowledge/adoption of mangrove conservation and restoration which have been introduced under ICR project.<br>- Institutional Additionality: Absence of dedicated regulations for mangrove conservation, the project acknowledges the need for institutional support and regulatory frameworks to enhance its effectiveness.<br>- Common Practice Additionality: There have been no conservation or restoration activities in the region with the objective of GHG removals and enhancing carbon sequestration. This initiative represents the first of its kind in a scientific and organized way. Prevailing norms and practices may not inherently align with optimal mangrove conservation methods, creating resistance to change.<br>**To address these barriers effectively, the project will employ a multi-pronged approach**: |

| | |
|---|---|
| | - Research and development: the project will invest in research and development, integrating state-of-the-art technologies for mangrove monitoring, rehabilitation, and ecosystem management. This approach aims to overcome technological barriers and propel the adoption of advanced practices.<br>- Institutional Support: The project proposes to engage with local and national institutions to foster collaborations, advocate for the development of mangrove-specific regulations, and establish governance structures to ensure sustainable mangrove management. By addressing institutional deficiencies, the project endeavors to create an enabling environment for long-term conservation efforts.<br>- Awareness campaigns: The project will conduct awareness campaigns and stakeholder engagement programs to instill the importance of mangrove conservation. By promoting a shift in common practices and fostering community participation, the project aims to create a cultural shift towards sustainable mangrove management.<br>VVB based on the review of barrier analysis of the project (as described under section 3.2 of this report) and on-site inspection/interviews/4.6//4.7/, confirms that the barriers identified by PP are appropriate for the subject region and PP has addressed both the barriers adequately to execute project's additionality per ICR requirement v5.0/B01/. |

### 5.5.5 Level 4a – Financial additionality I

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Not Applicable |

### 5.5.6 Level 4b – Financial additionality II

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | Not Applicable |

### 5.5.7 Level 5 – Policy additionality

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | As per section 5.7 of the ICR PDD/01/, the Kingdom of Saudi Arabia has established climate objectives within its Nationally Determined Contributions (NDCs) to the Paris Agreement, outlining efforts to reduce greenhouse gas emissions. While the government's climate action strategy emphasizes measures such as enhancing energy efficiency and increasing renewable energy adoption, it falls short in explicitly addressing the carbon sequestration potential inherent in mangrove conservation and restoration —precisely the focus of our project/01//4.6/.<br>The proposed project transcends the current policy landscape, offering a solution that both mitigates greenhouse gas emissions and restoration of vital mangrove ecosystems. By advocating for practices that sequester carbon in both soil and biomass, our project not only aligns with global climate objectives but also contributes to the creation of additional revenue streams for local communities, thereby fostering regional socio-economic |

| | |
|---|---|
| | development. This alignment with climate objectives not currently addressed in the government's strategy underscores the project's Policy Additionality[/01//4.6/].<br><br>VVB, confirms that there is currently no specific mandate for mangrove plantation in Saudi Arabia. The initiative to plant tens of millions of mangroves by 2030 is part of the Kingdom's efforts to preserve biodiversity and mitigate climate change, but it is not mandated by law or regulation at this time. Hence, VVB confirms that the project activity goes beyond its host country's/Saudi Arabia's climate objectives and lies outside the scope of the climate action strategy towards the host country's NDCs, and level 5 additional per ICR requirement v5.0[/B01/]. |

## 5.6 Baseline scenario

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | CL 20 has been issued and resolved upon revision in section 6 of ICR PDD. |
| Conclusion | The validation team has visited the sample sites, randomly identified within the project boundary, and observed that the pre-project scenario includes barren land-parcels along with degraded mangrove vegetation[/01//4.6//4.7/]. Detailed assessment on baseline scenario identification has been provided under section 3.2 of this report.<br><br>VVB, based on review of the ICR PDD[/01/], document review[/09-f,h//10/] and on-site inspection of the project site, confirms that the baseline scenario identified by PP is relevant, has been correctly quoted and interpreted in the project description. The baseline scenario has also been confirmed through interviews with the end users of technologies and representatives of PP.<br>Based on the review of the ICR PDD[/01/], on-site inspection/interviews and supporting documents[/10/], VVB confirms that the baseline scenario for the first project instance has been identified in accordance with the applied methodology AR-AM0014 [/B02/]and ICR requirement document v5.0[/B01/] and thus is deemed valid & applicable by the VVB |

## 5.7 Project boundary

| | |
|---|---|
| Means of Project Validation | Desk-Review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | VVB, has reviewed the ICR PDD[/01/] and confirms that the identification and selection criteria of GHG SSRs complies with the applied methodology and International Standard ISO 14064-2[/B01/] and applied methodology AR-AM0014 v3.0[/B02/].<br>As per section 7 of the ICR PDD[/01/] and further confirmed during on-site interviews[/4.6/], there will not be any kind of site preparation for proposed project, not even fertilization or burning of pre-existing vegetation, therefore, the project does not expect to have GHG emissions by pertinent sources.<br>VVB, confirms that.<br>• Project boundary of the project activity has been properly delineated.<br>• All identified GHG sources, sinks and reservoirs for the project and baseline scenarios have been appropriately defined in the ICR PDD[/01/].<br>• The selection and justification for inclusion or exclusion is acceptable<br><br>Considering the desk-review[/01/], supporting information provided[/02-10/] by PP, and on-site inspection/interviews[/4.6//4.7/], VVB confirms that the project boundary has been demonstrated appropriately, all the inclusions/exclusions made by PP are complying against the applied methodology[/B02/] and ICR requirements[/B01/]. |

| | |
|---|---|
| | The carbon pools selected for GHG accounting of the proposed project are SOC, AGB, BGB, and have been found valid and acceptable to the VVB. The emission sources identified and associated GHG gases selected for both baseline and project scenarios are same i.e., soil organic carbon ($CO_2$). The change in biomass stock of SOC, AGB and BGB carbon pool has been quantified for the project scenario /01//4.6//4.7/. |

## 5.8 Quantification of GHG emission mitigations

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CAR 08 was raised and resolved. |
| Conclusion | As per the section 8.2 of the ICR PDD/01/, the ex-ante net anthropogenic GHG emission reductions and removals are calculated using equation 6 of the methodology AR-AM0014:<br>$\Delta C_{AR-CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t$<br>Where,<br>$\Delta C_{AR-CDM,t}$ = Net anthropogenic GHG removals by sinks, in year $t$; t $CO_2$-e<br>$\Delta C_{ACTUAL,t}$ = Actual net GHG removals by sinks, in year $t$; t $CO_2$-e<br>$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks, in year $t$; t $CO_2$-e<br>$LK_t$ = GHG emissions due to leakage, in year $t$; t $CO_2$-e<br>VVB confirms that the PP has incorporated the methods for quantifying the GHG removals generated by the project in accordance with the applied methodology AR-AM0014 v3.0/B02/. VVB has performed review of all input data, parameters, formulas, calculations, conversions, and output data to ensure consistency with the documentation/01//02/, methodology/B02/, associated and tools/B02/. |

### 5.8.1 Criteria and procedures for quantification

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | The following approaches have been applied by PP to quantify GHG mitigations generated from project/01//4.6/:<br>• **AR-AM0014 v3.0:** "Afforestation and reforestation of degraded mangrove habitats v3.0**":** to quantify GHG emissions and/or removals achieved from project activities.<br>• **CDM AR TOOL 14:** Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities v4.0; to calculate Change in carbon stock in baseline shrub biomass within the project boundary in year t.<br>• **CDM AR-Tool 12**- Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities v3.0; to calculate Change in carbon stock in baseline dead wood biomass within the project boundary, in year t.<br>The description provided in the PDD with respect to criteria and procedures applied for GHG quantification is found to be valid and appropriate aligning with applied methodology. |

### 5.8.1.1 Baseline emissions

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CL 15 was issued and resolved. |
| Conclusion | As per ICR [PDD/01/], The baseline net GHG removals by sinks shall be calculated as follows:<br><br>$\Delta C_{BSLt} = \Delta C_{TREE\_BSL,t} + \Delta C_{SHRUB\_BSL,t} + \Delta C_{DW\_BSL,t}$<br>Equation (1)<br>Where:<br>$\Delta C_{BSLt}$ = Baseline net GHG removals by sinks in year t; t CO2-e<br><br>$\Delta C_{TREE\_BSL,t}$ = Change in carbon stock in baseline tree biomass within the project boundary in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO2-e<br><br>$\Delta C_{SHRUB\_BSL,t}$ = Change in carbon stock in baseline shrub biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities"; t CO2-e<br><br>$\Delta C_{DW\_BSL,t}$ = Change in carbon stock in baseline dead wood biomass within the project boundary, in year t, as estimated in the tool "Estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities"; t CO2-e<br><br>As stated in the A/R Methodological Tool "Estimation of non-$CO_2$ GHG emissions resulting from burning of biomass attributable to an A/R CDM project activity, v4.0.," the ex-ante and ex-post carbon stocks in trees and shrubs in the baseline can be considered zero under certain conditions specified in the PDD. All the conditions were satisfied and the changes in carbon stocks in trees and shrubs in the baseline are also accounted as zero. Baseline net GHG removals by sinks are conservatively accounted as zero.<br>VVB based on the review of the project description and baseline assessment (Please refer section 3.2 of this report) and further verified during on-site inspection/interviews confirms that prior to project implementation project area is subject to degraded/fragmented mangrove vegetation and barren land parcels. Additionally, project SOPs are in place ensuring that there will not be any biomass burning during site preparation for plantation. Therefore, in accordance with section 5.4. of AR-AM0014 v3.0[/B02/] the conservative estimate of baseline emissions/removals as 0 (zero) is valid and acceptable to the VVB. |

### 5.8.1.2 Project emissions

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CL 15 was issued and resolved. |
| Conclusion | As per the ICR PDD [/01/], The ex-ante net GHG removals by sinks are calculated utilizing Equation 2 from the AR-AM0014 A/R Methodology Version 3.0. This calculation method accounts for the net change in carbon stocks by summing up changes in living biomass (above and below ground), deadwood, and soil organic carbon stocks, and subtracting GHG emission increase of any kind within project boundary. According to the methodology, emissions from activities such as herbaceous vegetation removal, fossil fuel combustion, fertilizer use, wood usage, litter decomposition, and transportation are |

considered negligible and thus set to zero for calculation purposes. This ensures a uniform and conservative assessment of the project's GHG impact,

**Net GHG removals by sinks (equation 2 of AR-AM0014 v3.0):**

$\Delta C_{ACTUAL,t} = \Delta C_{P,t} - GHG_{E,t}$

Where,

$\Delta C_{ACTUAL,t}$ = Actual net greenhouse gas removals by sinks at time t; t $CO_2$-e
$\Delta C_{P,t}$ = Change in carbon stocks in project, occurring in the selected carbon pools, at time t; t $CO_2$-e
$GHG_{E,t}$ = Increase of non-$CO_2$ GHG emissions within the project boundary as a result of the implementation of the A/R CDM project activity, in year t, t $CO_2$-e

**Change in carbon stocks in project – $\Delta C_{P,t}$**

$\Delta C_{P,t}$ is defined as the sum of changes in living biomass (above and belowground), deadwood and soil organic carbon stocks. It is calculated using equation 3 of the methodology:

$\Delta C_{P,t} = \Delta C_{TREE\_PROJ,t} + \Delta C_{SHRUB\_PROJ,t} + \Delta C_{DW\_PROJ,t} + \Delta C_{SOC\_PROJ,t}$ (Equation 3, of AR-AM0014)

Where:

- $\Delta CP,t$ = Change in carbon stocks in project, occurring in the selected carbon pools, at time t; t $CO_2$-e
- $\Delta C_{TREE\_PROJ,t}$ = Change in carbon stock in tree biomass in project in year t, as estimated in AR-Tool14; t $CO_2$-e
- $\Delta C_{SHRUB\_PROJ,t}$ = Change in carbon stock in shrub biomass in project in year t, as estimated in AR-Tool14; t $CO_2$-e
- $\Delta C_{DW\_PROJ,t}$ = Change in carbon stock in dead wood in project in year t, as estimated in AR-Tool12; t $CO_2$-e
- $\Delta C_{SOC\_PROJ,t}$ = Change in carbon stock in the soil organic carbon (SOC) pool within the project boundary, as estimated in AR-AM0014, in year t; t $CO_2$-e

VVB based on the interviews[/4.6/] with the project personnel and physical inspection project site[/4.7/], confirms that project activity has been designed to restore mangrove ecosystem of the project area through plantation of mangrove seedlings. Therefore, it is unlikely to expect that project will lead to have any emissions from activities such as from biomass burning, excavation of project site, cutting of existing vegetation during project's technical life.
Furthermore, since GHG removals from litter decomposition is expected to be negligible, therefore change in carbon stock of tree and soil biomass has been taken into consideration for project scenario. Which has been quantified using equation 12 of CDM AR Tool 14 v4.2[/B02/].

**Mean carbon stock in trees:** Tree biomass per hectare has been estimated using the equations provided as follows:

$C_{TREE} = 44/12 \times CF_{TREE} \times B_{TREE}$ Eq. (12)

$B_{TREE} = A \times b_{TREE}$ Eq. (13)

$bTREE = \Sigma wiMi = 1 \times b_{TREE,I}$ Eq. (14)

Where:

- $C_{TREE}$ = Carbon stock in trees in the tree biomass estimation strata; $tCO_2e$
- $CF_{TREE}$ = Carbon fraction of tree biomass; t C (t d.m.)$^{-1}$ A default value of 0.5 was used as per the methodology
- $B_{TREE}$ = Tree biomass in the tree biomass estimation strata; t d.m.
- A = Sum of areas of the tree biomass estimation strata; ha
- $B_{TREE}$ = Mean tree biomass per hectare in the tree biomass estimation strata; t d.m. ha$^{-1}$
- wi = Ratio of the area of stratum I to the sum of areas of tree biomass estimation strata (wi = Ai/A); dimensionless
- $b_{TREE,i}$ = Mean tree biomass per hectare in stratum i; t d.m. ha$^{-1}$

**Mean tree biomass per hectare in stratum:**

Following requirement of applied tool CDM AR-Tool 14/B01/, PP expect to utilize allometric equations from Clough et al. (2007) and Comely and McGuiness (2005) for trees with discernable locations to measure DBH for this project because the climate zone matches that of Saudi Arabia. Additionally, in a mangrove carbon stock assessment study in the United Arab Emirates, both equations were used for Avicennia trees (Schile et al. 2017). These citations are the only ones where highly branching growth forms of arid mangrove species are adequately accounted for/01//4.6/.

However, for the ex-ante estimation (for mean tree biomass per hectare in stratum $b_{Tree}$), for uniformity of calculation, PP has applied the value 0.5 tones d. m./ha/year, following standard value from IPCC 2014 (Table 4.4 Aboveground biomass growth in mangrove forests (tonnes d.m.ha-$^{1}$ yr-$^{1}$)/01//02/. The value applied is valid and acceptable to the VVB.

**The assumed ex-ante planting density** is 10,000 plants ha$^{-1}$ which will be increased /decreased assessing the survival rates in the future plantations. Default carbon fraction: 0.5 as per A/R methodological tool CDM-AR Tool 14/B02/.

| strata no | plantation year | planting area (ha) | No of plants |
|---|---|---|---|
| 1 | 2028 | 9.9 | 99,000 |

VVB has confirmed through conversing/4.6/ with the project participant involved in project documentation and reporting that the planting density of 10,000 seedlings/ ha has been estimated considering that the seedlings will be planted at a spacing of 1m x 1m. This spacing has derived from insights gained from several mangrove restoration projects and technical manuals associated with them[30].

**Estimation of the changes in carbon stocks in shrub biomass: $\Delta C_{SHRUB\_PROJ,t)}$**

Carbon stocks in shrub biomass will not be taken into account in either ex-ante or ex-post estimates as they are not included in the project activity.

**Estimation of the changes in carbon stocks in dead wood $\Delta C_{DW\_PROJ,t}$**

Dead wood is expected to remain in the project areas and will not be removed. Therefore, carbon stock in this pool is assumed not to increase under a conservative approach.

[30] Lewis, R.R. 2005. Ecological Engineering for Successful Management and Restoration of Mangrove Forests." Ecological Engineering 24(4): 403-418.
Bosire, J.O., et al. 2008. "Functionality of restored mangroves: A review." Aquatic Botany 89(2): 251-259.
https://doi.org/10.1016/j.ecss.2011.07.009
https://doi.org/10.21203/rs.3.rs-2217608/v1
http://dx.doi.org/10.22617/TIM189796-2

| | |
|---|---|
| | **Estimation of changes in carbon stocks in Soil Organic Carbon:ΔSOC $_{PROJ,t}$**<br><br>As per the AR-AM0014 methodology (Version 03.0), the change in carbon stock in the SOC pool within the project boundary, in year t, was estimated as follows:<br><br>Δ SOC $_{PROJ,t}$= 44/12 x $\Sigma A_{PLANT,ttt}$=1 x d SOC$_t$ x 1 year Eq. (4) of AR -AM0014<br><br>Where,<br><br>ΔSOC $_{PROJ,t}$ = Change in carbon stock of the soil organic carbon (SOC) pool within the project boundary, in year t;<br>A $_{PLANT,t}$ = Area planted in year t; ha<br>dSOC $_t$ = The rate of change in SOC stocks within the project boundary, in year t; t C ha-1 yr-1<br><br>The following default value is used, unless transparent and verifiable information can be provided to justify a different value:<br>1. dSOCt = 0.5 t C ha-1 yr-1 for t = tPLANT to t = tPLANT + 20 years, where tPLANT is the year in which planting takes place;<br>2. dSOCt = 0 t C ha-1 yr-1 for t > tPLANT + 20 years<br><br>In literature the most appropriate estimation suitable for this region is found in Cusack et al ,2018[31]. There the average soil carbon accumulation in and adjacent areas is 0.126 t C ha$^{-1}$ year$^{-1}$. This value is used for ex ante calculations.<br><br>Based on the review of ICR PDD/01/, "Cusack et. al2018", VVB confirms that the value applied (for change in carbon stock of the soil organic carbon (SOC) pool within the project boundary, in year t) as 0.126 t C ha$^{-1}$ year$^{-1}$, is valid and appropriate.<br><br>Reference of default data/parameter values and assumptions applied has been provided. VVB, has cross-verified all the sources referred and confirms that the values applied are following the methodological requirement and provides a conservative estimate of the net GHG removals in the project scenario. VVB has further reviewed the SOPs (Field Monitoring Protocol)/07/, planned to be employed by project monitoring and reporting team to ensure transparent and accurate execution of monitoring plan as described in the project description/01/.<br>Based on the desk review/01//02/, on-site interviews/4.6/ and ex-ante carbon calculation spreadsheet/02/ all the above-mentioned procedure followed by PP for GHG accounting in the baseline as well as in the project scenario deemed valid and acceptable by the VVB. |

### 5.8.1.3 Leakage

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | According to the applied methodology AR-AM0014 (v3.0) leakage emission is estimated as follows:<br>LK$_t$ = LK,$_{AGRIC,}$ (Equation 16, 5 of AR-AM0014)<br>Where: |

[31] M Cusack *et al* 2018 *Environ. Res. Lett.* **13** 074007

| | |
|---|---|
| | • $LK_t$ = GHG emissions due to leakage, in year t; t CO2-e.<br>• $LK_{,AGRIC,t}$ = Leakage due to the displacement of agricultural activities in year t, as estimated in the tool "Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity"; t $CO_2$-e<br><br>Project activity include only mangrove restoration and plantation is the only activity implemented in degraded mangrove areas where there is no agricultural activity previous to the start date. Therefore, no displacement of agricultural activities would occur after the implementation of the project ($LK_t$ = 0).<br>VVB based on the baseline assessment (section 3.2 of this report), confirms that the project area does not include agricultural and/or any such land use which would face leakage due to displacement upon project initiation. Therefore, the PP's assumption of leakage from project activity to be 0 is valid and acceptable to the VVB. |

### 5.8.2 Quantification of Net-GHG emissions and/or removals

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CAR 06 was issued and resolved after receipt of updated ex-ante carbon calculation report. |
| Conclusion | The ex-ante net anthropogenic GHG emission reductions and removals are calculated using equation 6 of the methodology AR-AM0014:<br><br>$\Delta C_{AR-CDM,t} = \Delta C_{ACTUAL,t} - \Delta C_{BSL,t} - LK_t$<br><br>Where,<br><br>$\Delta C_{AR-CDM,t}$ = Net anthropogenic GHG removals by sinks, in year *t*; t $CO_2$-e<br>$\Delta C_{ACTUAL,t}$ = Actual net GHG removals by sinks, in year *t*; t $CO_2$-e<br>$\Delta C_{BSL,t}$ = Baseline net GHG removals by sinks, in year *t*; t $CO_2$-e<br>$LK_t$ = GHG emissions due to leakage, in year *t*; t $CO_2$-e<br><br>The project activity's Net GHG removals are given below: |

| Year | Baseline emissions ($tCO_2e$) | Project emissions ($tCO_2e$) | Estimated leakage ($tCO_2e$) | Reductions ($tCO_2e$) | Removals ($tCO_2e$) | Total GHG emission mitigations ($tCO_2e$) |
|---|---|---|---|---|---|---|
| 16 /04/2028 to 31 December 2028 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 January 2029 to 31. December 2029 | 0 | 0 | 0 | 0 | 14 | 14 |
| 1 January 2030 to 31. December 2030 | 0 | 0 | 0 | 0 | 23 | 23 |
| 1 January 2031 to 31. December 2031 | 0 | 0 | 0 | 0 | 32 | 32 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 January 2032 to 31. December 2032 | 0 | 0 | 0 | 0 | 41 | 41 |
| 1 January 2033 to 31. December 2033 | 0 | 0 | 0 | 0 | 50 | 50 |
| 1 January 2034 to 31. December 2034 | 0 | 0 | 0 | 0 | 59 | 59 |
| 1 January 2035 to 31. December 2035 | 0 | 0 | 0 | 0 | 68 | 68 |
| 1 January 2036 to 31. December 2036 | 0 | 0 | 0 | 0 | 77 | 77 |
| 1 January 2037 to 31. December 2037 | 0 | 0 | 0 | 0 | 86 | 86 |
| 1 January 2038 to 31. December 2038 | 0 | 0 | 0 | 0 | 95 | 95 |
| 1 January 2039 to 31. December 2039 | 0 | 0 | 0 | 0 | 104 | 104 |
| 1 January 2040 to 31. December 2040 | 0 | 0 | 0 | 0 | 113 | 113 |
| 1 January 2041 to 31. December 2041 | 0 | 0 | 0 | 0 | 123 | 123 |
| 1 January 2042 to 31. December 2042 | 0 | 0 | 0 | 0 | 132 | 132 |
| 1 January 2043 to 31. December 2043 | 0 | 0 | 0 | 0 | 141 | 141 |
| 1 January 2044 to 31. December 2044 | 0 | 0 | 0 | 0 | 150 | 150 |
| 1 January 2045 to 31. December 2045 | 0 | 0 | 0 | 0 | 159 | 159 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 January 2046 to 31. December 2046 | 0 | 0 | 0 | 0 | | 168 | 168 |
| 1 January 2047 to 31. December 2047 | 0 | 0 | 0 | 0 | | 177 | 177 |
| 1 January 2048 to 31. December 2048 | 0 | 0 | 0 | 0 | | 186 | 186 |
| 1 January 2049 to 31. December 2049 | 0 | 0 | 0 | 0 | | 195 | 195 |
| 1 January 2050 to 31. December 2050 | 0 | 0 | 0 | 0 | | 204 | 204 |
| 1 January 2051 to 31. December 2051 | 0 | 0 | 0 | 0 | | 213 | 213 |
| 1 January 2052 to 31. December 2052 | 0 | 0 | 0 | 0 | | 222 | 222 |
| 1 January 2053 to 31. December 2053 | 0 | 0 | 0 | 0 | | 231 | 231 |
| 1 January 2054 to 31. December 2054 | 0 | 0 | 0 | 0 | | 241 | 241 |
| 1 January 2055 to 31. December 2055 | 0 | 0 | 0 | 0 | | 250 | 250 |
| 1 January 2056 to 31. December 2056 | 0 | 0 | 0 | 0 | | 259 | 259 |
| 1 January 2057 to 31. December 2057 | 0 | 0 | 0 | 0 | | 268 | 268 |
| 1 January 2058 to 15 April 2058 | 0 | 0 | 0 | 0 | | 277 | 277 |
| **Total** | | | | | | | 4357 |
| **Annual average** | | | | | | | 145 |

| | |
|---|---|
| | VVB has reviewed the GHG emission mitigations calculations results in the carbon calculation spreadsheet[/02/] against relevant formulae, parameters, referenced methodology and tools defined in the ICR-PDD[/01/]. The quantification approach followed, and results obtained have been found to be correct and applicable by VVB.<br>The ICR PDD and carbon calculation spreadsheets[/02/], and on-site inspection/interviews[/I4.6/], revealed that the calculations of the aggregated emissions mitigations are correctly calculated in accordance with the applied methodology[/B02/] and its formulas/equations. VVB confirm that the indicated number of emissions and/or removals, resulting in total ex-ante estimated GHG removals as 4,357 $tCO_2e$ over the crediting period of 30 years, represents a reasonable estimation and is consistent with the assumptions/methods presented in the project documents. |

### 5.8.3 Risk assessment for permanence.

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CAR 06 was issued and resolved upon receipt of additional information on permanence risk analysis. |
| Conclusion | VVB has reviewed the non-permanence risk analysis described in section 8.3 of ICR PDD[/01/] in compliance with the ICR requirement document, Version 5.0 [/B01/]. PP has performed the permanence risk analysis in accordance with ISO 31000 Risk Management Principles and Guidelines. The risks identified along with the risk score and VVB assessment are as mentioned in the table below: |

| Risk | | VVB assessment and Justification |
|---|---|---|
| Internal Risks | **Project management (PM)** | By reviewing the literature reference[13, 32, 33] and verified during on-site inspection[/4.7/], VVB confirms that *Avicennia marina* is one of the most likely to be the suitable mangrove species for the project region thus has been identified for plantation by PP.<br><br>**Mitigation:** Adaptive management plan in place.<br>Justification and evidence: Project activities are monitored and evaluated on a regular basis according to the project's monitoring plans and SOPs with respect to these various activities. The information becoming available as a result of these monitoring and evaluation activities and continued consultations with stakeholders will be fed into future actions and decision making so as to enable adaptive management of the project and its interventions. Hence the risk rating for this factor is -2.<br><br>PP has demonstrated a comprehensive project monitoring and reporting plan in the section 10 and Appendix of the ICR PDD[/01/], reflecting information on: SOPs for soil sampling and data collection, Above ground and below ground biomass measurement, sampling methodology, GHG data collection reporting process, data management process, and QA/QC procedure to ensure data accuracy and transparency. Therefore, VVB confirms that the risk score of -2 for project management risk is appropriate and acceptable. |
| | **Financial Viability** | **Mitigation:** Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven. Risk score is selected as -2. |

[32] https://www.researchgate.net/publication/290487516_Distribution_of_mangroves_along_the_Red_Sea_coast_of_the_Arabian_Peninsula_Part-1_The_northern_coast_of_western_Saudi_Arabia
[33] https://link.springer.com/chapter/10.1007/978-3-662-45201-1_33

| | | | |
|---|---|---|---|
| | | | Justification and Evidence: Saudi Aramco has dedicated sufficient funds for the establishment of the project, without a need for financial returns from the project. |
| | | **Opportunity Cost (OC)** | Based on the review of the ICR PDD/01/, onsite inspection/interview/4.6/, and review of the concession agreement in place (concession agreement-Arabic)/05/, VVB has confirmed that the "Ministry of Petroleum and Mineral Resources", Riyadh has awarded Saudi Aramco (the project proponent), a concession agreement, authorizing them to access and oversee the designated project area and execute project-related activities since 1961 indefinitely.<br>Therefore, the risk score of 0 is valid and applicable for the project activity. |
| | | **Project longevity (PL)** | |
| | **Total internal risk (PM+ FV + OC + PL)** | | In conclusion, VVB confirms that the total internal risk for the ICR project gives 0, which is deemed appropriate and valid |
| | External Risks | **Land Tenure and Resource Access/Impacts (LT)** | Ownership and resource access/use rights are held by various entity(s) (e.g., land is government owned, and the project proponent holds a lease or concession).<br>Justification and evidence: the land is owned by the Kingdom of Saudi Arabia and the project proponent has a concession agreement with the Kingdom to legally operate their project activities on the island indefinitely. Thus, the risk score of 2 has been considered.<br><br>**Mitigation:** Project Area is protected by legally binding commitment (e.g., a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period.<br>Based on the review of the ICR PDD/01/, onsite inspection/interview/4.6//4.7/, and review of the legal binding agreement in place/05/, VVB confirms that the Saudi Aramco, as the Project Proponent has the rightful ownership of the Carbon Credits from the sale of ICCSs generated from the GHG mitigations subjected to project implementation in the region.<br>VVB confirms that the project area is protected by a legally binding commitment to continue management practices that protect carbon stocks over the length of the project crediting period.<br>Hence, VVB confirms that the risk score of 0 is valid and acceptable. |
| | | **Community Engagement (CE)** | The project area is under control of Saudi Aramco per concession agreement/05/, which confirms that only project proponent has the right to access of land resources of project area. Additionally, during on-site inspection/4.7/, VVB has observed that the project area is free from any human-habitation.<br>Hence, VVB confirms that the risk score of 0 is valid and acceptable. |
| | | **Political Risk (PC)** | As per the ICR PDD/01/, the country's calculated governance score is -0.23. It was further confirmed by reviewing the World Bank Institute Worldwide Governance Indicators score for Saudi Arabia (2022) with the value for all 6 governance indicators, averaged over the most recent five year (2017-2021), available at: WGI 2022 Interactive > Home (worldbank.org).<br>VVB confirms that risk score 2 is acceptable. |
| | **Total external risk (LT + CE + PC)** | | In conclusion, VVB confirms that the total external risk for the ICR project gives 2, which is deemed appropriate and valid |
| | Natural Risks | **Fire (F)** | Risk is not applicable to project area.<br>Evidence: The risk of fire is negligible due to regular inundation. Additionally, the area defined has a thriving mangrove community since 1990, which has not been affected by any reported fire. |
| | | **Pest and Disease outbreaks (PD)** | Risk is not applicable to project area.<br>Evidence: As a native ecosystem, the risks from disease and pests are minimal in the site. The area defined has a thriving mangrove community since 1991, which has not been affected by any reported pest or disease. |

| | | |
|---|---|---|
| | **Extreme Weather (W)** | Risk is not applicable to project area.<br>Evidence: The project area is not susceptible to severe natural destructive events such as storms. Although droughts in arid regions like Saudi Arabia may be an extreme weather event, it would have minimal to no impact on the mangroves there, given that mangroves on the Island are accustomed to arid conditions already. |
| | Geological risk (G) | Risk is not applicable to project area.<br>Evidence: Rahimah Bay is not subject to significant geological activity. E.g., occurrence of significant earthquakes is negligible, as seen on https://earthquakelist.org/saudi-arabia/eastern-province/dammam/ |
| | Other natural risk (ON): Oil spill | Minor (5% to less than 25% loss of carbon stocks)<br>Evidence: The last oil spill happened approximately 30 years ago during the Gulf War; therefore, we conservatively assume the likelihood of another oil spill to be 25-50 years. It is however important to note that the project site was chosen as a safe place to conserve mangrove propagules as part of a salvage operation after the oil spills following the Gulf War. These mangrove propagules have since developed into a significant mangrove community. Therefore, the impact of an oil spill on the site is likely to be low.<br>Risk score of 1 has been selected. |
| **Total natural risk (F + PD + W + G + ON)** | | In conclusion, VVB confirms that the total natural risk for the ICR project gives 1, which is deemed appropriate and valid. |

Overall Non-performance risk rating and buffer determination:

| Risk Category | Rating |
|---|---|
| Internal Risk | 0 |
| External Risk | 2 |
| Natural Risk | 1 |
| Overall Risk Rating (a + b + c) | 10 |

In total, the project faces the abovementioned risks affecting permanence of GHG mitigation projected from project and if certain risks are there, mitigation measures are in place. In accordance with ICR requirement v5.0/B01/ (section 4.8), PP has applied a risk score of 10% is adequate for the project activity. In the opinion of VVB, the overall project implementation and management is sound and reasonable. Thus, VVB confirms that the identified risk score is appropriate for the proposed project.

## 5.9 Management of data quality

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CL 13 was raised and resolved. |
| Conclusion | Following the ISO 14064-2 guidance/B01/, PP has employed the data management system. The process of recording data and system maintenance as described in section 9 of the ICR PDD has been found to be in place during the onsite inspection/interviews/4.6. //4.7/. The project proponent will keep the record directly on automatically stored on cloud-based data storage system. To ensure long-term data accuracy and comparability, the same set of parameters will be monitored in every monitoring session.<br>PP has established a robust procedure to delineate the roles and responsibilities of personnel engaged in the project activity. This ensures that personnel possess the requisite knowledge of project activities, management procedures, technical |

| | |
|---|---|
| | requirements, and quality assurance and control procedures in accordance with the project monitoring plan.<br><br>Soil sampling steps have been planned in compliance with CDM tool's protocols. The evaluation of Soil Organic Carbon (SOC) data is conducted based on established criteria, ensuring reliability and consistency.<br><br>The project team consists of experts with extensive experience and expertise in relevant fields, including soil management, agricultural science, carbon accounting, and environmental science. Annual GHG assessments undergo internal review and third-party audits to ensure compliance with rigorous quality standards.<br>VVB confirms that PP ensures the effective implementation and monitoring of carbon sequestration activities, with a strong emphasis on data quality, reliability, and personnel expertise. |

## 5.10 Monitoring

### 5.10.1 Monitoring plan

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | CL 13 was raised and resolved. |
| Conclusion | The monitoring procedures and reporting are structured in accordance with the requirements of the ISO 14064-2(2019) standard, ICR Standard v5.0 (section 4.10)[/B01/] and the latest version of CDM methodology AR-AM0014 v3.0[/B02/]. The PP has developed a team of qualified professionals to execute the monitoring activities.<br><br>For the data collection and management, the data is collected during the field activities for recording the key parameter accurately. These recorded data sheets are securely kept at the head office as hard copies ensuring accessibility and safety against loss of record. These procedures are then followed by regular checking, ensuring accuracy, and eliminating errors and data backup measures are implemented.<br><br>The project activity also involves an internal auditing process for the transparency, credibility, and reliability of the data for further analysis and decision-making.<br>For conservation, the project adopted a systematic approach to selecting suitable locations. For the precision of the data, PP has used GPS for spatial coordinating of each area and established six transects, each spanning 400–750 meters, approx., for the facilitation of the comprehensive investigation of the mangrove forest on the coast. With careful planning, all transects are at 1km apart, avoiding overlapping and ensuring representative sampling.<br>For sampling and analysis, the project team conducts observation and recording for the following: Vegetation canopy, mangrove plant composition, and abundance. The team assesses mangrove's ecosystem health, where vegetation canopy, mangrove plant composition and abundance will be recorded using the number of individuals. In addition, samples are collected twice during dry season Additionally, sediment, water, and bio fauna and flora samples will be collected twice (dry season). Through field monitoring and remote sensing tools, the research considers three levels of habitat fragmentation (also known as strata):<br>1. Intact Mangrove Areas with Minimal Fragmentation<br>2. Moderately Fragmented Mangrove Patches |

| | |
|---|---|
| | 3. Highly Fragmented or Sparse Mangrove Areas<br>30 samples are taken from 5 plots in each transect for non-destructive determination of biomass and soil carbon stock as well as species composition.<br><br>The project proponent adopts statistical validation for ensuring the reliability of the estimated values. This validation involves parameters such as pH, Eh, DBD, OC, carbon stock, and GHG emissions. For the effectiveness of the project, the PP conducts monitoring at regular intervals depending on the scope and nature of the conservation activities.<br>VVB has reviewed the SOP for soil sampling and data collection and SOP for estimation of Above/below ground biomass and confirm that the SOPs are valid and applicable for the proposed project. Further PP has employed quality control and quality assurance procedure to ensure accuracy and transparency of the on-field data collect followed by monitoring and reporting. |

### 5.10.2 Data and parameters remaining constant.

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | The project employs baseline and monitoring methodology namely AR-AM0014: Afforestation and reforestation of degraded mangrove habitats Version 3.0 /B02/ for project monitoring and data collection. According to section 3.2 of ICR PDD/01/ the data/parameters that remain constant following the requirements of the methodology are given below: |

| Data/ parameter | Unit | Description | Value applied | VVB assessment |
|---|---|---|---|---|
| $\Delta C_{BSL,t}$ | t $CO_2$-e | Baseline net GHG removals by sinks in year t | 0 | Based on the review of the description of the measurement methods and procedure applied in ICR PD /01/, VVB considers the value applied as appropriate.<br>The value is based on section 5 of AR-TOOL 14 as described in section. |
| $CF_{TREE}$ | t C (t d.m.)$^{-1}$ | Carbon fraction of tree biomass | 0.5 | The value is taken as per the default value of AR-TOOL 14 is used unless transparent and verifiable information can be provided to justify a different value.<br>The VVB confirms the same by reviewing carbon calculation sheet/02/. |
| $d_{SOCt}$ | t $CO_2$e ha$^{-1}$ yr$^{-1}$ | The rate of change in SOC stocks within the project boundary, in year t | 0.126 | This is based on the soil C accumulation rate of 0.126 t C ha$^{-1}$ year$^{-1}$ derived from Cusack et al. (2018).<br>The same has been confirmed by VVB after checking the literature referred and found to be applicable. |

| | |
|---|---|
| | VVB based on the desk-review[/01/], and supplementary documentation[/02/] confirms that the details on data/parameter available and/or default value applied is in accordance with the applied monitoring methodology and acceptable to the VVB. |

### 5.10.3 Data and parameters monitored.

| | |
|---|---|
| Means of Project Validation | Desk review, on-site inspection, and interviews |
| Findings | NA |
| Conclusion | The validation/verification team has reviewed the data and parameters to be monitored detailed in the PDD[/01/] against the applied methodology AR-AM0014 v3.0[/B02/]. The team further, during the site visit, interviews with PP and project personnel assessed the monitoring and recording procedures in place. Data and Parameters to be monitored have been summarized below: |

| Data/ parameter | Unit | Description | Value applied | Monitoring frequency | VVB assessment |
|---|---|---|---|---|---|
| $A_i$ | Ha | Area of tree biomass stratum i | 9.9 ha | Before the start of the project (planting) and adjusted every five years from initial validation. | Areas in the project area will be tracked in the field using the GPS. Each plot which will be subject to planting is tracked - a standard procedure of the baseline and monitoring inventory. VVB confirms the same by checking KML files for project area[/03/]. |
| $w_i$ | N/A | Relative weight of the area of stratums i, the area of the stratum i divided by the project area. | 0.25 | Before the start of the project (planting) and adjusted every five years from initial validation | Area of the stratum i divided by the project area. |
| DBH | Cm | Diameter breast height of tree | Annually measured. | Annually | Diameter at breast height (DBH) is measured at 1.3 m along the stem using a DBH tape. VVB confirms that the dbh measurement at 1.3 m above ground is valid and acceptable. |

# 6. Independent review

The internal technical reviewer has independently assessed the project documentation to ascertain compliance with applicable GHG program requirements and adherence to internal procedures in forming the validation opinion.

The technical review of the project documentation has been carried out by independent reviewer who was not involved in the validation activity of the subject project. Upon completion of final validation report the report is submitted for the technical review. At this stage, any outstanding issues are either addressed or new findings are identified for resolution by the assessment team and/or project proponents.

The technical reviewer, acting on behalf of Carbon Check (India) Private Limited, serves as the decision-maker. A positive opinion is granted if all findings are satisfactorily resolved; otherwise, a negative opinion is issued, unless the contract is terminated prior to final assessment.

The technical reviewer has confirmed that the project particulars have been described in accordance with the applicable ICR requirements and ISO 14064-3 guideline.

# 7. Validation opinion

Saudi Arabian Oil Co. (Saudi Aramco) has appointed Carbon Check (India) Private Ltd. to perform the validation of project "Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)' with the anticipated start date of 16/04/2028. CCIPL has conducted the on-site inspection for validation of the proposed ICR project activity on 24/01/2024. This report summarizes the findings from the validation of the project particulars and their resolutions, performed based on ICR criteria, as well as criteria given to provide for consistent project operations, monitoring, and reporting.

The validation activities conducted by CCIPL included: collection of information, documents and data supporting the estimated GHG removals and GHG calculation spreadsheets; assessment of eligibility criteria; assessment of management system, assessment of information management system, assessment of whether the project has been implemented in accordance with the ICR PDD/01/, assessment of whether the provisions made in the monitoring plan were consistently and appropriately applied.
The validation assessment has been conducted to indicate the reasonableness of assumptions, limitations, and methods supporting the statement made by project proponent regarding the ex-ante i.e., constant values for the relevant data and parameters. Based on the review of the ICR PDD/01/, carbon calculation spreadsheets/02/, and relevant supporting evidence (i.e., peer review literature/09/, IPCC default values, region specific research studies), VVB confirms that all the assumptions and statements made by PP area valid and appropriate with the possible reasonableness. Further, VVB has assessed the relevant data and parameters in section 3.3.8 of this report.

The validation process has been performed based on all guidance and criteria as provided in ICR requirement Document v5.0, ISO 14064-2, 14064-3, ISO 14065/B01/, and applied baseline and monitoring methodology is AR-AM0014: "Afforestation and reforestation of degraded mangrove habitats v3.0/B02/.

VVB, upon thorough review of project description/01//02/, audit interviews/4.6/, and physical verification/4.7/ of the project site, confirms that native mangrove species (*Avicennia marina*) is planned to be planted in the project region. VVB further confirms that the selected methodology is applicable to the project and has been correctly applied to ensure accurate project monitoring and reporting. The project description/01/ provides the information about project activity as, ICR requirements and in VVB's opinion meets the requirements of the applied baseline and monitoring methodology CDM AR AM0014 and is likely to achieve the estimated emission reductions and/or removals.

As the project's ex-ante estimations are based on the above-mentioned variables which are most likely to change with time and conditions (i.e., Climate Change) it is expected that the actual results may vary from the estimated values. The validation has been performed using a risk- based approach, as described above. The total estimated GHG removals from the project are 4,357 $tCO_2e$ over the crediting period of 30 years (16/04/2028 to 15/04/2058) with an annual average of 145 $tCO_2e$. VVB has carried out the additionality check of the project activity (detailed under section 5.5 of this report) and confirms that the project activity is not a common practice in the region and the net GHG emission mitigations generated from the project will be additional to what would have been the business as usual in the project region.

VVB, based on the desk review /01//07/ as well as on-site inspection/interviews/2.3/2.4/, confirms that the project activity has been designed to generate GHG removals from the project through implementation of mangrove plantations and management practices in the region. The selected baseline and monitoring methodology (AR-AM0014) Afforestation and reforestation of degraded mangrove habitats Version 3.0) is applicable to the project and has been applied.
During the validation of the project a total of 33 findings have been raised by VVB, including 08 CARs, 24 CLs, and 00 FAR and upon the receipt of request clarification and/or supporting evidence all the findings have been satisfactorily closed.

Carbon Check (India) Pvt. Ltd. concludes the validation of the project activity with a positive opinion that the ICR Project Activity "Dammam DRT Sustainable Wetlands and Mangrove Conservation (DD-SWAM)", as described in the latest version of ICR PD/01/, meets all the applicable ICR requirements, including those specified in the Project Standard, relevant methodology, tools, and guidelines and has been implemented in consistence with the information as provided in the project description.

# Appendix

## I. Documents reviewed or referenced in the report

| No. | Title | Version | Provider |
|---|---|---|---|
| /01/ | ICR PDD 137V2.2 CLEAN QA -QC -CLEAN.docx<br>ICR PDD 137V2.2 CLEAN QA -QC -TC.docx | V2.2 (on 19/04/2024 | Yadgreen |
| /02/ | **Carbon Calculation Sheet**<br>Ex-ante: 137 DD SWAM -CALCULATION MODEL (.xlsx) | On 27/03/2024 | Yadgreen |
| /03/ | **Project Location:**<br>a. DAMMAM DRT 2014 (1)<br>b. DAMMAM DRT 2018<br>c. DAMMAM DRT 2020<br>d. 2014 (.jpg)<br>e. 2018 (.jpg)<br>f. 2020 (.jpg) | On 08/04/2024 | Yadgreen |
| /04/ | **Stakeholder**<br>a. Stakeholder Consultation Report (.pdf)<br>b. Grievance Addressal Process-scan (.pdf) | On 26 - 27/03/2024 | Yadgreen |
| /05/ | **Project Ownership**<br>a. credit ownership - DD SWAM-scan (.pdf)<br>b. Concession Agreement (.pdf): Concession agreement and legal right<br>c. concession agreement-Arabic (.pdf) | On 26 - 27/03/2024 | Yadgreen |
| /06/ | **Project Start Date:** start date (.pdf) | On 26/03/2024 | Yadgreen |
| /07/ | **Project SOPs**<br>a. PLANTATION SOP TC 23.03.2024 (.docx)<br>b. seed survival rate SOP<br>c. SOP_2_Field Monitoring Protocol CLEAN (.docx)<br>d. SOP_3_Data Quality Assurance and Control | On 26 - 27/03/2024 | Yadgreen |
| /08/ | Declaration (.pdf_for double counting) | On 13/03/2024 | Yadgreen |
| /09/ | **References/Source links/literature**<br>a. Reforestation_of_grey_mangroves_Avicennia _marina_a<br>b. J. KA U: M ar. Sci .• '·01.7.SpeciatIssue: S)"1111'." " Re d S ell Mo r.Environ .. Icddah,1.(;<14.rr.263-270 ( 1416 A .H . / 1996 A.D.: “Mangrove ecosystem of Saudi Arabian Red Sea coast – an overview”.<br>c. LOVELOCK LITERATURE: Lovelock CE, Ball MC, Martin KC, Feller IC (2009) Nutrient Enrichment Increases Mortality of Mangroves. PLoS ONE 4(5): e5600. doi:10.1371/journal.pone.0005600<br>d. 01-PJLS 001_0213_0513 Hanan et al: Almahasheer Hanan, Al-Taisan Wafa, K. Mohamed Mohey, “Mangrove Deterioration | On 13/03/2024 to 08/04/2024 | Yadgreen |

| | | | |
|---|---|---|---|
| | in Tarut Bay on the Eastern Province of the Kingdom of Saudi Arabia" Pakhtunkhwa J. Life Sci. Volume 01, Issue 02, 2013, P 49-59<br>e. 10.1515_chem-2020-0010 (1): Alsamadany Hameed, S. Al-Zahrani Hassan, M. Selim El-Metwally, M. El-Sherbiny Mohsen "Spatial distribution and potential ecological risk assessment of some trace elements in sediments and grey mangrove (Avicennia marina) along the Arabian Gulf coast, Saudi Arabia", Open Chem., 2020; 18: 77–96<br>f. Mangrove status: "Present Status and Degradation Trends of Mangrove Forest on the Southern Red Sea Coast of Saudi Arabia", American-Eurasian J. Agric. & Environ. Sci, 6 (3): 328 -240, 2009, ISSN 1818-6769.<br>g. mjcrs-1000124: Amin SA, Fouad MS, Zyada MA. Human, Urban and Environmental-Induced Alterations in Mangroves Pattern along Arabian Gulf Coast, Eastern Province, KSA. Madridge J Case Rep Stud. 2018; 2(2): 94-100. doi: 10.18689/mjcrs-1000124<br>h. qt0n50738r_noSplash_17546334f8c1daf53f64b99126cd60c5 (1).pdf: Moatamed Adel"Degradation of mangrove forests and coral reefs in the coastal area of the southwestern region of Saudi Arabia", The Journal of Integrative Biogeography 35 (2020): 71-89. | | |
| /10/ | **Baseline Conditions**<br>Photographs of project area: JPEG Files depicting degraded or not healthy condition of existing mangroves. | | |
| /B01/ | **ICR and ISO requirements/guidelines**<br>**a)** ICR-Definitions-v1.0.pdf<br>**b)** ICR requirement document (gitbook.io): Standard version 5.0<br>**c)** ICR-Process-Requirements-v4.0.pdf<br>**d)** ISO 14064 2 2019.pdf<br>**e)** ISO 14064 3 2019.pdf<br>**f)** ISO 14065-2020.pdf<br>**g)** ISO 31000 | | |
| /B02/ | **Methodology Applied**<br>Afforestation and reforestation of degraded mangrove habitats v3.0: 8AE9TYMDSZJP762KF3CL0NWR5HBIUV (unfccc.int)<br>**Tools applied:**<br>1. Combined tool to identify the baseline scenario and demonstrate additionality (Ver 02.1). (unfccc.int)<br>2. CDM AR Tool 14: untitled (unfccc.int) | | |
| /B03/ | **a) Other GHG programs:**<br>**CDM:** CDM: Project Activities (unfccc.int)<br>**GCC:** GCC PROJECTS PORTAL (globalcarboncouncil.com) | | |

| | |
|---|---|
| | **GSF:** GSF Registry (goldstandard.org)<br>**Plan Vivo:** Projects \| Plan Vivo Foundation<br><br>b) **ICR project page:** **ICR- 137:** https://www.carbonregistry.com/explore/projects/damm-am-dr-137/versions |

## II. Site visits

| No. | Site ID | Location | Type | Audit team member(s) |
|---|---|---|---|---|
| /1/ | 01 | Dammam, Saudi Arabia | Validation/on-site inspection and interviews | Vijay Mathews, Vikash Kumar Singh |
| | | | | |
| | | | | |

## III. Non-conformities

**List of Findings from Validation**

**Table 1. Remaining FAR from previous validations**

| | | | | |
|---|---|---|---|---|
| **FAR** | 00 | **Section no.** | | **Date:** DD/MM/YYYY |
| **Description of FAR** | | | | |
| | | | | |
| **Project participant response** | | | | **Date:** DD/MM/YYYY |
| | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** DD/MM/YYYY |
| | | | | |

**Table 2. CL from this validation**

| | | | | |
|---|---|---|---|---|
| **CL** | 01 | **Section no.** | 1.1, ICR PDD | **Date:**15 /01/2024 |
| **Description of CL** | | | | |

**Documentation provided by project participant:**

*DD-SWAM PDD. V1.2.docx*

*Dammam DRT.kmz*

**The VVB, based on review of files, provide by PP confirms that inconsistences have been identified:**

1- The files "Dammam DRT.kmz" only have a coordinate of project location additionally mentioned in PDD section 1.3 but doesn't correspond with the requirements of ICR Requirement Document v5.0, Section 4.2.

The PP must define the geographic boundary of the project area to facilitate accurate delineation of project activity instances, furthermore the KML should have a details information as required in concordance with the ICR Requirement Document. While doing so, PP shall demonstrate whether "Ras Tanura Eco Park region" is included in the project region.

The illustrative example is depicted in the accompanying figure below as a reference of KML shared by PP.


The PP is requested to provide shapefiles/KML files of the project area and planting area.

| | |
|---|---|
| **Project participant response** | **Date:** 13/03/2024 |
| The shapefile is provided, with the boundaries, plantable areas, and existing mangrove areas clearly marked. The Ras Tanura Eco Park region is not included in this project. Any mention of it in the Project Design Document (PDD) is due to a typographical error | |

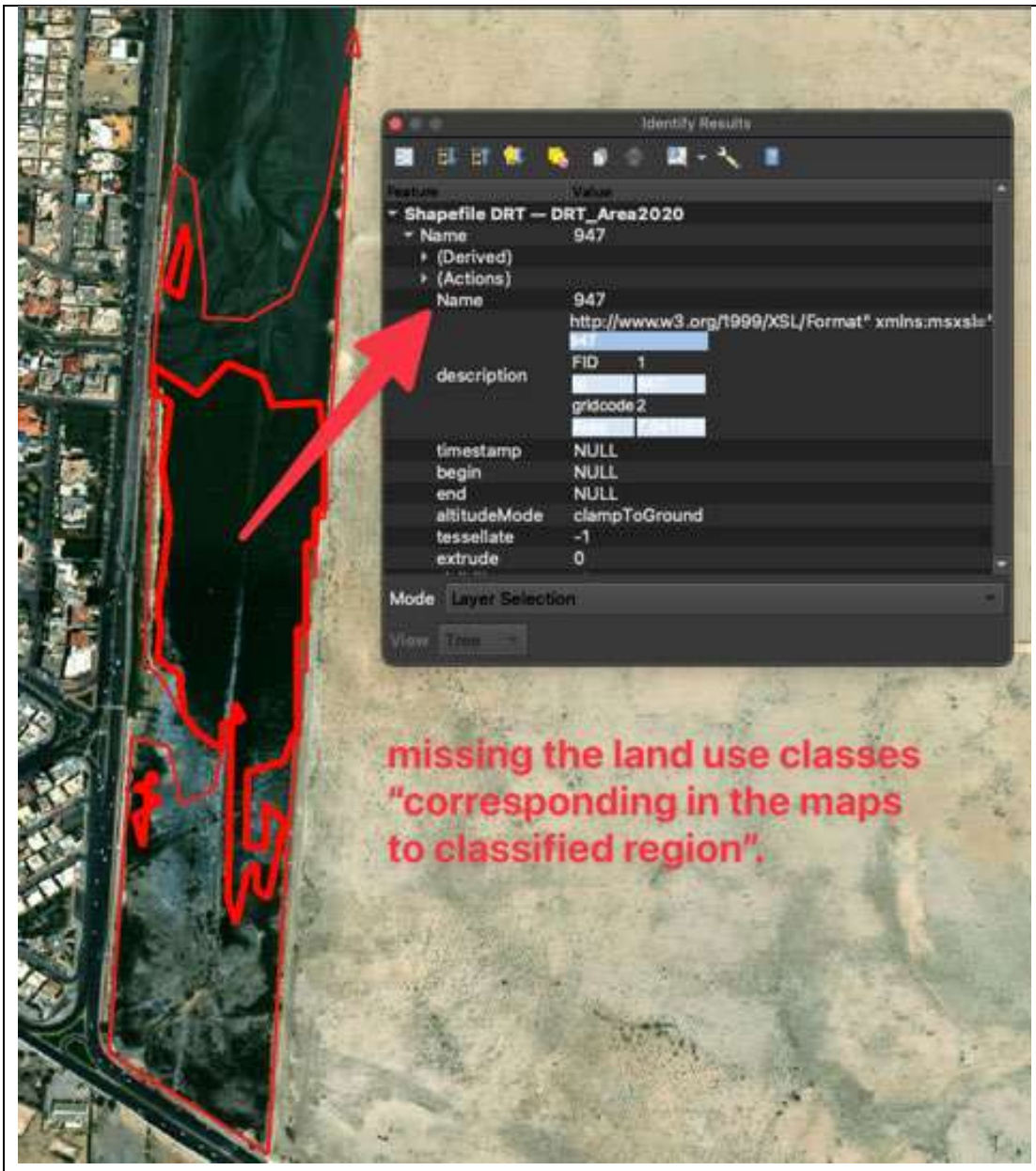
| **Documentation provided by project participant** | |
|---|---|
| • DRT Shapefile.kmz (2014)<br>• Shapefile DRT.kmz (2020) | |
| **VVB assessment** | **Date:** 21/03/2024 |

While reviewing the KML files provided, VVB has observed that the KML files exhibit inconsistencies detailed as follow:

1. The provided KML files exhibit inconsistency in the spatial extensions of 'DRT Shapefile.kmz (2014)' and 'Shapefile DRT.kmz (2020)' differ from each other. Please refer to the figure below for a visual comparison."

   The difference in spatial extension of both shapefiles represent a difference in total selected area 16.4 ha (DRT 2014) vs 16.9 ha (DRT2020).


2. The KML files provided does not include information on the land use classes “corresponding in the maps to classified region”; Please refer the figure below.




3. Following the requirement of section 4.2 of the ICR Standard v5.0,
   The project proponent shall provide a detailed description of the geographical boundary of the project activities and the physical location of facilities as applicable to project activities. The physical boundary shall be documented with GPS coordinates. The project proponent shall provide maps, shapefiles, and other relevant information to delineate the project boundary as applicable.
   PP shall provide respective information in section 1.4 of the ICR PDD.

**CL still open.**

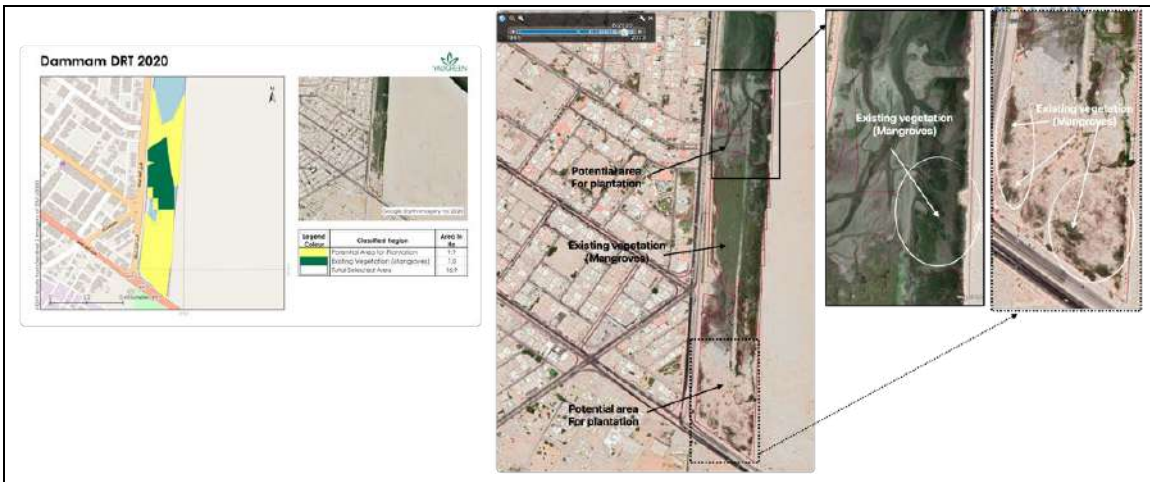
| **Round 2** | |
|---|---|
| **Project participant response** | **Date:** 26/03/2024 |
| Corrected Images are attached | |

| **Documentation provided by project participant** | |
|---|---|
| *DRT AREA 2014 CONVERTED (2).kmz*<br><br>*DRT AREA 2018.kmz*<br><br>*DRT AREA LULC (2).kmz* | |
| **VVB assessment** | **Date:** 26/02/2024 |
| Based on the review of the provided KML files, it is confirmed that the revised delineation of the project area effectively clarifies the total extent of the project boundary. Furthermore, it delineates the potential area available for plantation upon project implementation.<br><br>  <br><br>The discrepancy in area for respective specifics have been addressed and acceptable to the VVB. Additionally, the Land Use/Land Cover have been delineated in the KML files.<br><br>**CL has been closed.** | |

| **CL** | 02 | **Section no.** | ICR PDD 1.5 Technology Applied | **Date:**26 /03/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| Section 1.5 of the ICR PDD is incomplete and not in compliance with the ICR template instructions, including field monitoring reports, laboratory analyses and carbon-flux measurements, | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| The PDD has been updated to the latest version with the necessary changes | | | | |

| **Documentation provided by project participant** | |
|---|---|
| ICR PDD ID137 V 2.1 -DDSWAM | |
| **VVB assessment** | **Date:** 26/03/2024 |
| The requisite information has been provided in the latest version of ICR PDD document to reflect information on technology applied (now under section 1.6 of ICR PDD v2.10 for the proposed project.<br><br>VVB confirms that information on project specific technological operations, outlining parameters of field monitoring and laboratory analysis, techniques planned to be employed for plantation and maintenance of native mangrove species, and advanced monitoring approach for future projections (of Carbon flux, ecosystem health and soil carbon status) in the project region.<br><br>**The CL has been closed.** | |

| **CL** | 03 | **Section no.** | Remote sensing data | **Date:** 15/1/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PP is requested to provide all the satellite imageries mentioned in the ICR PDD "1.5 Technology Applied" including NDVI and Land cover classification, | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Imageries for the years 2014 and 2020 are provided. | | | | |
| **Documentation provided by project participant** | | | | |
| *DRT_2014 LUC (JPG)*<br><br>*DRT_2020 LUC (JPG)* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| 1. The imagery provided do not consider, other areas with forest or trees clearly identify in google earth image for the same year, the figure below represents the LULC 2020 (Google earth image from same date) exhibits areas within potential areas for plantation with trees or mangroves vegetation. | | | | |

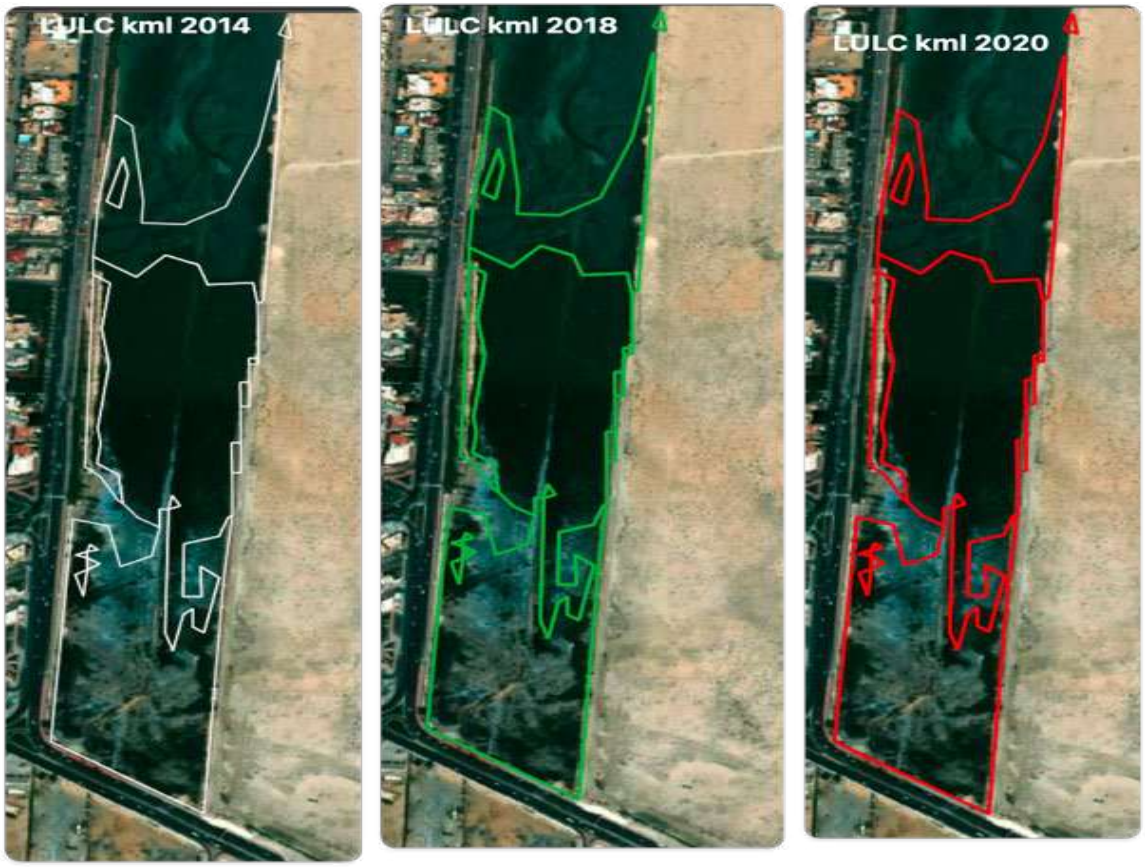



The LULC files provided are only in image format (JPG). To ensure proper validation of the data provided, PP must provide LULC satellite image files in easily readable formats, such as GeoTIFF, KML, KMZ, Shapefile, etc.

**CL is still open.**

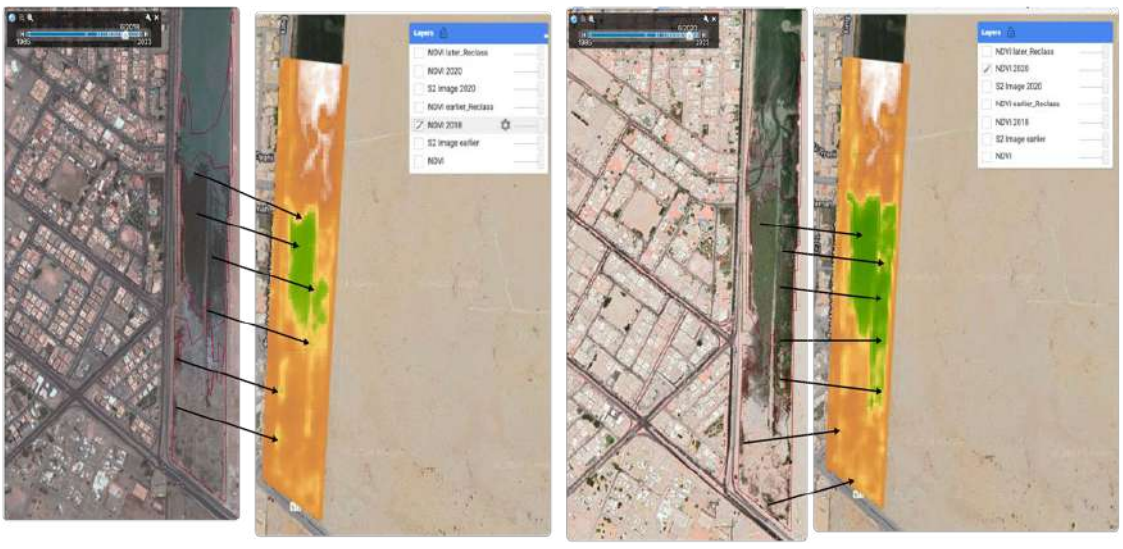
| **Round 2** | |
|---|---|
| **Project participant response** | **Date:** 26/03/2024 |
| .kmz files are provided . | |
| **Documentation provided by project participant** | |
| *DRT AREA 2014 CONVERTED (2).kmz*<br>*DRT AREA 2018.kmz*<br>*DRT AREA LULC (2).kmz*<br>*DRT_2020 copy.jpg* | |
| **VVB assessment** | **Date:** 26/03/2024 |

After reviewing the KML files provided by PP, VVB observed that the KML files for LULC 2014-2018-2020 remain




unchanged throughout the analysed period. For a clearer understanding, please refer to the figure below.

However, analysis of the project area, utilizing NDVI calculations derived from Sentinel-2 imagery, reveals a significant change in Mangrove areas between 2018 and 2020. This observation was further corroborated by comparing the NDVI data with corresponding Google Earth images from the same timeframe. Refer to the figure below for visual representation.



| |
|---|
| PP shall provide supporting document for LULC delineation considering the LULC definition fitted to the project scale. PP must provide LULC satellite image files in easily readable formats, such as GeoTIFF, KML, KMZ, Shapefile, etc.<br><br>**CL is still open.** |
| |
| **Round 3** |

| **Project participant response** | **Date:** 08/04/2024 |
|---|---|
| | |
| **Documentation provided by project participant** | |
| Revised KML files have been provided. | |
| **VVB assessment** | **Date:** 09/04/2024 |
| VVB based on the review of the revised KML files concludes that the project proponent expects only to restore the degraded mangrove habitat area identified within the project boundary, through plantation activity.<br><br>To avoid further discrepancy further discrepancy regarding project area and land use cover in current scenario PP has now excluded the area under existing mangrove vegetation from the project boundary and thereby aligns with the ICR guideline and requirement of methodology applied AR-AM0014 (section 2.2.)<br><br>Based on the review of files and evidence provided by PP, VVB confirms that kml for LULC (2014,2018 & 2020) and the literature provided, are enough evidence to prove the mangrove degradation in and around the project area.<br><br>VVB confirms that the revised documentation is valid and acceptable for the subject ICR project.<br><br>**The CL has been closed.** | |

| **CL** | 04 | **Section no.** | 3.4 ICR PDD | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PP is requested to provide the Environmental Impact Assessment (EIA) report mentioned in Section 3.4 of the ICR PDD. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Project activities implemented within the project region are designed with utmost consideration for environmental and biodiversity protection ensuring that they do not pose significant environmental risks or harm to the ecosystem. Hence Environmental Impact Assessments (EIAs) are not required at this stage. However, should any phase of the project demand it due to unforeseen environmental concerns or changes in project scope, we are committed to conducting the necessary EIAs to reassess the impact and implement appropriate measures. | | | | |
| **Documentation provided by project participant** | | | | |
| - | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |

As per the Environmental Act No. 193 of 2001 of Saudi Arabia (promulgated by Royal Decree No. M/34 of 2001 to protect the environment, society, and promote sustainable development of natural resources),

"The law requires that environmental assessment studies be conducted at the feasibility stage for all projects with potential adverse impacts on the environment, per the specified principles and standards".

This legislation aims to regulate various activities that may have an impact on the environment, such as industrial operations, waste management, and land use. It sets standards for environmental protection, establishes procedures for environmental impact assessments, and outlines penalties for non-compliance with environmental regulations.

However, as the project aims to restore the native ecosystem in the subject region through mangrove plantation activities, VVB confirms that Environmental Impact Assessment is not applicable for the proposed project.

Further as described under section 3.1 of the ICR PDD: "The project is conducted within the framework of the Saudi Arabian Environment Law (Royal Decree No. M/165 of 2020), which mandates environmental protection and promotes sustainable usage practices. It further complies with the National Strategy for the Conservation of Biodiversity, emphasizing both in-situ and ex-situ conservation efforts, and aligns with the objectives of the Saudi Green Initiative aimed at reducing emissions, advancing afforestation, and safeguarding terrestrial and marine habitats". Therefore, VVB confirms that the project activity is being carried out in accordance with the requirement of the "Environmental Rules and Regulation" of the host country.

**The CL has been closed.**

| **CL** | 05 | **Section no.** | 1.14 "Other Benefits" ICR PDD | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PP is requested to clearly demonstrate how the project will meet the SDGs selected, as stated in section 1.14 of the listed ICR PDD.<br><br>In line with section 1.14 ICR PDD Template (v4.0), PP is requested to describe how the project contributes to achieving any nationally stated sustainable development priorities, including any provisions for monitoring, and reporting same. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| The mangrove restoration project in Saudi Arabia contributes to multiple Sustainable Development Goals (SDGs) through targeted activities and measurable impacts:<br><br>SDG 13 (Climate Action): Enhances coastal resilience against climate impacts by restoring mangroves, acting as natural barriers against storms and flooding.<br><br>SDG 14 (Life Below Water): Improves water quality and reduces marine pollution by filtering pollutants through mangrove restoration; supports marine biodiversity by expanding protected mangrove areas, contributing to the health and productivity of coastal and marine ecosystems.<br><br>SDG 15 (Life on Land): Increases mangrove coverage to conserve terrestrial ecosystems and biodiversity, supporting the habitat of threatened species, and demonstrates the integration of ecosystem values into development and conservation planning.<br><br>Monitoring and reporting mechanisms will track the project's contributions to these SDGs, aligning with national sustainable development priorities and ensuring a comprehensive approach to environmental and social sustainability. | | | | |

| **Documentation provided by project participant** | |
|---|---|
| *ICR PDD ID137 V 2.1 -DDSWAM* | |
| **VVB assessment** | **Date:** 26/03/2024 |
| PP has furnished the revised edition of the ICR PDD, incorporating the necessary details outlined in section 1.14. Based on the review of the ICR PDD and verified during on-site inspection/interviews, VVB confirms that the information on project's contributions towards sustainable development goals adhere to ICR PDD template instructions and applicable for the proposed project activity.<br><br>However, it is requested to align with the template instruction and provide SDG targets (anticipated for the proposed project) in the first column and impacts of project implementation under 3rd column of the subject table.<br><br>**CL is still of open.** | |
| **Round 2** | |
| **Project participant response** | **Date:** 23/03/2024 |
| SDGs no.13,14 and 15 is added | |
| **Documentation provided by project participant** | |
| ICR PDD ID137 V 2.2 -DDSWAM | |
| **VVB assessment** | **Date:** 26/03/2024 |
| PP has provided the revised ICR PDD to reflect requisite corrections and has provided the respective SDG targets in section 1.14 of the ICR PDD. Thus, PDD information is valid and acceptable to the VVB.<br><br>**CL has been closed.** | |

| **CL** | 06 | **Section no.** | 1.14, ICR PDD | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As stated in section 1.14 of the listed ICR PDD, PP shall clearly demonstrate the appropriateness of the selected SDGs by identifying relevant targets and indicators specifically for the selected SDGs 11 and 14. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Section is updated with necessary details. The mangrove restoration project in Saudi Arabia's arid regions primarily aligns with SDG 14: Life Below Water, due to its direct impact on marine biodiversity, climate change mitigation and adaptation, and support for marine life and fisheries. By restoring mangrove ecosystems, the project enhances biodiversity, providing critical habitat for marine and terrestrial species, and supports the resilience of marine ecosystems against climate change through carbon sequestration. Furthermore, healthy mangrove areas bolster fish populations, underpinning livelihoods dependent on fishing and promoting the sustainable use of marine resources. SDG 11 is removed from PDD .The decision to remove SDG 11: Sustainable Cities and Communities from the Project Design Document (PDD) was made to focus the project's impact narrative and resource allocation on marine and coastal ecosystem conservation, where its outcomes are most significant, thereby ensuring a targeted contribution to sustainable development objectives. This strategic choice highlights the project's commitment to directly addressing the conservation and sustainable use of marine resources, as outlined in SDG 14, demonstrating its specific relevance and impact in the context of environmental sustainability. | | | | |

| **Documentation provided by project participant** | |
|---|---|
| *ICR PDD ID137 V 2.1 -DDSWAM* | |
| **VVB assessment** | **Date:** 26/03/2024 |
| The updated ICR PDD incorporates essential details regarding the sustainable development contributions anticipated from the project activity. VVB, has evaluated the applicability of the SDG targets identified for the proposed project and confirms them to be valid and acceptable.<br><br>**The CL has been closed.** | |

| **CL** | 07 | **Section no.** | 3.4, ICR Requirements Document (v5.0) | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| In line with section 3.4 of the ICR Requirements Document (v5.0):<br><br>"The project's start date is the date when operations of the climate project start leading to<br><br>GHG emission mitigation."<br><br>PP is requested to provide evidence for start date as per the requirements stated above. PP shall also provide incontrovertible evidence, including receipts of financial transactions, agreements and/ or employment records. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| As the project's start date is scheduled for 2028, currently, the only available documentation is the undertaking by the Project Proponent. Additional evidence, including receipts of financial transactions, agreements, and employment records, will become available closer to the project's commencement. We are committed to ensuring all necessary documentation will be provided in a timely manner to meet the requirements stated. | | | | |
| **Documentation provided by project participant** | | | | |
| *start date (.pdf)* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| As per the response and/or evidence provided and the information provided in the ICR PDD v2.0, PP anticipate project's commencement by April 2028.<br><br>VVB confirms that in line with section 3.3 of the ICR Process Requirements v5.0, the evidence of project start date can be provided after implementation of proposed project activity in the subject region. Thereby VVB has raised a Forward Action Request (FAR) in this regard.<br><br>However, PP is requested to address following particulars:<br><br>• PP is requested to clarify, how Project Proponent and/or Project Participant come to conclusion of identifying the Project Start Date as 16th April 2028 (*start date (.pdf)*), or 16/04/2028 (ICR PDD).<br>• Further in accordance with the requirement of section 3.3 of the ICR Project Requirements v5.0, PP is requested to provide evidence for **Pre-registration** of the subject project under International Carbon Registry (ICR registry). This may include a confirmation mail from ICR Registry.<br>**The CL is still open.** | | | | |
| **Round 2** | | | | |

| **Project participant response** | **Date:** 23/03/2024 |
|---|---|
| Even though the project start identified as 16th April 2028 is random, it stems from a detailed project planning and feasibility analysis. This date reflects the culmination of preparatory activities, including securing necessary permits, finalizing project design, and ensuring financial closure, as well as the evaluation of mangrove restoration activities of other sites<br><br>The choice of this specific date allows for:<br><br>• Completion of all preparatory and groundwork activities.<br>• Synchronization with the fiscal year and funding cycles, ensuring adequate resource allocation.<br>• We commit to maintaining comprehensive records of all preparatory activities leading up to the project's commencement, including detailed planning documents, correspondence with regulatory bodies, and evidence of financial arrangements. | |
| **Documentation provided by project participant** | |
| ICR PDD vr2.0 | |
| **VVB assessment** | **Date:** 26/03/2024 |
| The PP has demonstrated the start date of the project on April 16th, 2028, based on a comprehensive examination of planning and feasibility analysis. This selection is strategically aligned with preparatory activities and funding cycles. The Project Proponent ensures to maintain records substantiating the decision, ensuring preparedness for the commencement of the project.<br><br>Further based on the review of the project page on ICR registry[34], VVB confirms that project has been listed under ICR Program and the project status has been updated to "under validation".<br><br>**CL has been closed.** | |

| **CL** | 08 | **Section no.** | 3.2, ICR PDD | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| Section 3.2 "Potential Negative Environmental and Socio-Economic Impacts" of the ICR PDD claims that "*The Project Activity is not expected to result in any negative environmental and no negative socio-economic impacts*."<br><br>PP is requested to demonstrate to justify the claim. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| As the project area is inaccessible to the public and devoid of local communities, minimizing the risk of socio-economic disruption. Additionally, the introduction of mangroves is carefully planned to enhance biodiversity and combat desertification without adversely affecting the existing ecosystem. Our efforts focus on selecting species and cultivation methods that are compatible with the local environment, ensuring that the restoration promotes ecological balance. Furthermore, the project contributes positively to carbon sequestration, shoreline stabilization, and the creation of habitats for marine and terrestrial wildlife, aligning with both local and global environmental conservation goals. | | | | |
| **Documentation provided by project participant** | | | | |

[34] https://www.carbonregistry.com/explore/projects/0cb568f0-3026-4efc-a8c5-3cee0a278a11?tab=overview

| | |
|---|---|
| **VVB assessment** | **Date:** 26/03/2024 |
| VVB based on the review of project description and further verified during on-site inspection confirms that no local stakeholders/community were present in the project region.<br>As Project Proponent has the legal concession rights of the subject project area, in future projections as well the project region does not expect any immigration.<br><br>Therefore, analysis of socio-economic impacts concerning local stakeholder is not applicable for the proposed project and acceptable to the VVB.<br><br>However, in line with section 4.2.1 of the ICR requirement document v5.0, PP is requested to identify the project's potential negative environmental impact expected during the project design and implementation of the activities. Additionally, PP shall provide measures or management plan in place to avoid any adverse impacts.<br><br>For instance, introduction of invasive species during project implementation, alterations in hydrological regime of the region, affecting nesting sites for sea turtles and other species. Thereby PP shall elaborate on mitigation measures to address any such adverse impact that may arise upon project development.<br><br>**CL is still open** | |
| **Round 2** | |
| **Project participant response** | **Date:** 23/03/2024 |
| Introduction of invasive species, ecological imbalance, impacts on local flora and fauna are identified as possible environmental impacts .Necessary mitigation measures and impacts are elaborated in the PDD | |
| **Documentation provided by project participant** | |
| *ICR PDD v2.0* | |
| **VVB assessment** | **Date:** 26/03/2024 |
| Based on the review of the revised ICR PDD, it is confirmed that Section 3.5 has been updated to encompass information concerning potential risks that may emerge throughout the project's lifecycle, accompanied by the corresponding mitigation measures to tackle these risks effectively.<br><br>**CL has been closed.** | |

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| **CL** | 09 | **Section no.** | 3.3, ICR PDD | **Date:** 16/01/2024 |
| **Description of CL** | | | | |
| Section 3.3 "Consultation with Interested Parties and Communications" of the ICR PDD mentions "*For Report and other details of the meeting please refer Appendix*."<br><br>No reports of the stakeholder meeting can be found in the appendix.<br><br>PP is requested to provide reports of the stakeholder meetings including details of the attending stakeholders and comments received during the meeting. | | | | |
| **Project participant response** | | | | |
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| **Documentation provided by project participant** | **Date:** 13/03/2024 |
|---|---|
| *stakeholder consultation report (.pdf)* | |
| **VVB assessment** | **Date:** 26/03/2024 |
| VVB based on the review of the revised documentation, confirms that PP has provided the information on stakeholder consultation meeting in section 3.3 of ICR PDD and further has provided respective document reflecting the day, agenda, and summary of the stakeholder meeting held on 25th September 2022.<br><br>**CL has been closed.** | |

| **CL** | 10 | **Section no.** | 4.2.1 "Safeguards" ICR Requirements Document v5.0 | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| In line with section 4.2.1 "Safeguards" ICR Requirements Document v5.0<br><br>"*All projects shall undergo a 30-day public comment period and the project proponent shall implement a process of continuous communication with local stakeholders*."<br><br>There is no mention of the 30-day public comment period in the PDD. PP is requested to provide details of the comment period including a list all comments received or provide a justification for its omission. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Although the project area in Dammam, Saudi Arabia, is not accessible to the public or situated near local communities, a 30-day public comment period was established to engage stakeholders associated with the project. This allowed for the submission and consideration of their inquiries and feedback. The details of this engagement and the responses to comments received have been comprehensively updated in the Project Design Document (PDD) | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| Upon reviewing section 3.3.1 of the latest ICR PDD document, VVB confirms that the provided description effectively addresses the received comments and outlines the actions taken to resolve them.<br><br>As per section 10.4 of the ICR process requirements 5.0,<br><br>*"Stakeholders may submit comments about any project activities. Such comments shall be submitted to admin@carbonregistry.com.*<br><br>*Comments received are shared with the project proponent, and the VVB performing the following validation/verification. Where the VVB has not been contracted, ICR shares comments received with the project proponent, and he shall provide the comments and any actions taken or comments responses to the validation/verification body.*<br><br>*Any comments received shall be addressed at the current or subsequent validation or verification unless ICR determines that an assessment of conformity is required, as described in section 9 above."* | | | | |

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| PP is requested to provide evidence of the timeline for "Public Comment period" along with confirmation from ICR registry that all the public comments received have been duly addressed.<br><br>**CL is still open.** |
| **Round 2** |
| **Project participant response** **Date:** 23/03/2024 |
| The public comment period for the mangrove restoration project was officially opened on immediately following the stakeholder meeting held on September 25, 2022. The period remained open for 30 days, concluding on 26th October 2022. Even though there were no comments raised, there were certain queries raised, which are communicated to ICR registry following instruction in as per section 10.4 of the ICR process requirements 5.0. The public comment period was informed directly to the departments involved in the stakeholder engagements in connection with mangrove restoration project. |
| **Documentation provided by project participant** |
| |
| **VVB assessment** **Date:** 26/03/2024 |
| Based on the review of the project page [35] on ICR registry VVB confirms that the proposed project has not received any comments during public comment period.<br><br>**CL has been closed.** |

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| **CL** | 11 | **Section no.** | 10.1: Monitoring plan, ICR PDD | **Date:** 16/01/2024 |
| **Description of CL** | | | | |
| Section 10.1 of the ICR PDD contains a table with parameters, methods, and references. There is no link provided to access these references for review.<br><br>PP is requested to provide links to all the mentioned references in the document. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Links will be provided | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| After reviewing the latest ICR PDD, it is confirmed that the document adequately references the sources and basis for the monitoring approaches to be employed upon project implementation.<br><br>**CL has been closed.** | | | | |

[35] https://www.carbonregistry.com/explore/projects/0cb568f0-3026-4efc-a8c5-3cee0a278a11?tab=overview

| CL | 12 | Section no. | ICR PDD (v4.0) | Date: 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| Following the ICR PDD Template (v4.0), there are some numbering inconsistencies in the sections of the PDD. For example,<br>• "Baseline emissions" should be section 8.1.1 but is numbered as 7.1.1.<br>• "Management of data quality" should be Section 9 but is numbered as 3 in the PDD.<br>• "Monitoring" should be Section10 but is numbered as 4 in the PDD.<br>• "Risk Assessment for Permanence" is numbered twice as 8.3 and 8.4.<br>PP is requested to correct the alteration and any other numbering inconsistencies in the PDD according to the ICR PDD Template (v4.0) | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| PDD is updated with proper numbering | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM (.pdf)* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| VVB based on the review of the latest ICR PDD provided by PP, confirms that the PDD description has been aligned with the ICR template instructions and is acceptable to the VVB.<br>**The CL has been Closed.** | | | | |

| CL | 13 | Section no. | ICR PDD (v4.0) | Date: 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PP is requested to use the latest approved methodology for quantification of GHG emission mitigations. In doing, PP is also requested to comply with paragraph 4.7 and 4.8 of the ICR requirement document, version 5.0. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| PDD and calculation sheet is updated with the ICR – approved methodology and calculations | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| Based on the review of the quantification approach outlined in sections 8 of the ICR PDD v2.0, it is confirmed that the methodology is thoroughly described, including the equations and formulas utilized to quantify the anticipated ex-ante GHG mitigation from the project activity.<br>VVB has further conducted a detailed examination of the ex-ante carbon calculation spreadsheet labelled "137 DD SWAM -CALCULATION MODEL" and confirmed that the data presented aligns consistently with the description provided in the ICR PDD. Furthermore, all formulas and default values employed for calculating net GHG emissions are clearly documented within the Excel sheet along with the reference/source of value. | | | | |

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| The default value used in the process of quantification of ex-ante estimation for the project are based on either identified baseline and monitoring methodology or based on IPCC guidelines and thus valid and acceptable to the VVB.<br><br>Further for projection of "The rate of change in SOC stocks within the project boundary, in year t" in the subject region has been quantified based on regional baseline studies and research carried out by Cusack et al. (2018).<br><br>VVB confirms that the proposed project activity has been designed appropriately in accordance with ICR requirements and aligns with methodology AR-AM0014 (Afforestation and Reforestation of Degraded Mangrove Habitats v3.0) and its associated tools.<br><br>**Therefore, the CL has been closed.** |

| **CL** | 14 | **Section no.** | ICR PDD (v4.0) | **Date:** 16/01/20 24 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PP has used the VCS Methodology ''Methodology for Tidal Wetland and Seagrass Restoration (VM0033)' Version 2.1" for calculating the baseline emission or removals and project emission. However, this methodology is not approved by ICR.<br><br>PP is requested to calculate "Baseline emission" and "Project emission" using the latest version of the approved methodology ICR methodology or tool. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| PDD and calculation sheet is updated with the ICR – approved methodology and calculation tools | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| Following a thorough examination of the ICR PDD and supplementary carbon calculation spreadsheet, VVB confirms that the project has diligently adhered to the ISO-14064-2 (2019) standards. In alignment with these requirements, the project has chosen to implement the CDM approved Methodology for baseline assessment and monitoring.<br><br>**Therefore, the CL has been closed.** | | | | |

| **CL** | 15 | **Section no.** | 1.8, ICR PDD (v4.0) | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per section 3.4.2 of the ICR Requirement document, v5.0,<br><br>"*Regarding project activities involving CDR, the crediting period is a conservative estimate of the technical lifetime of the installed technologies or implemented measures and associated impacts, with a maximum of 15 years. The crediting period may be renewed at a maximum of twice."*<br><br>However, in section 1.8 of the ICR PDD, the duration of crediting period has been given as 12/01/2024 to15/04/2053, 30 years. PP shall provide the details in compliance with above requirement i.e., 15 (to be renewed twice) | | | | |

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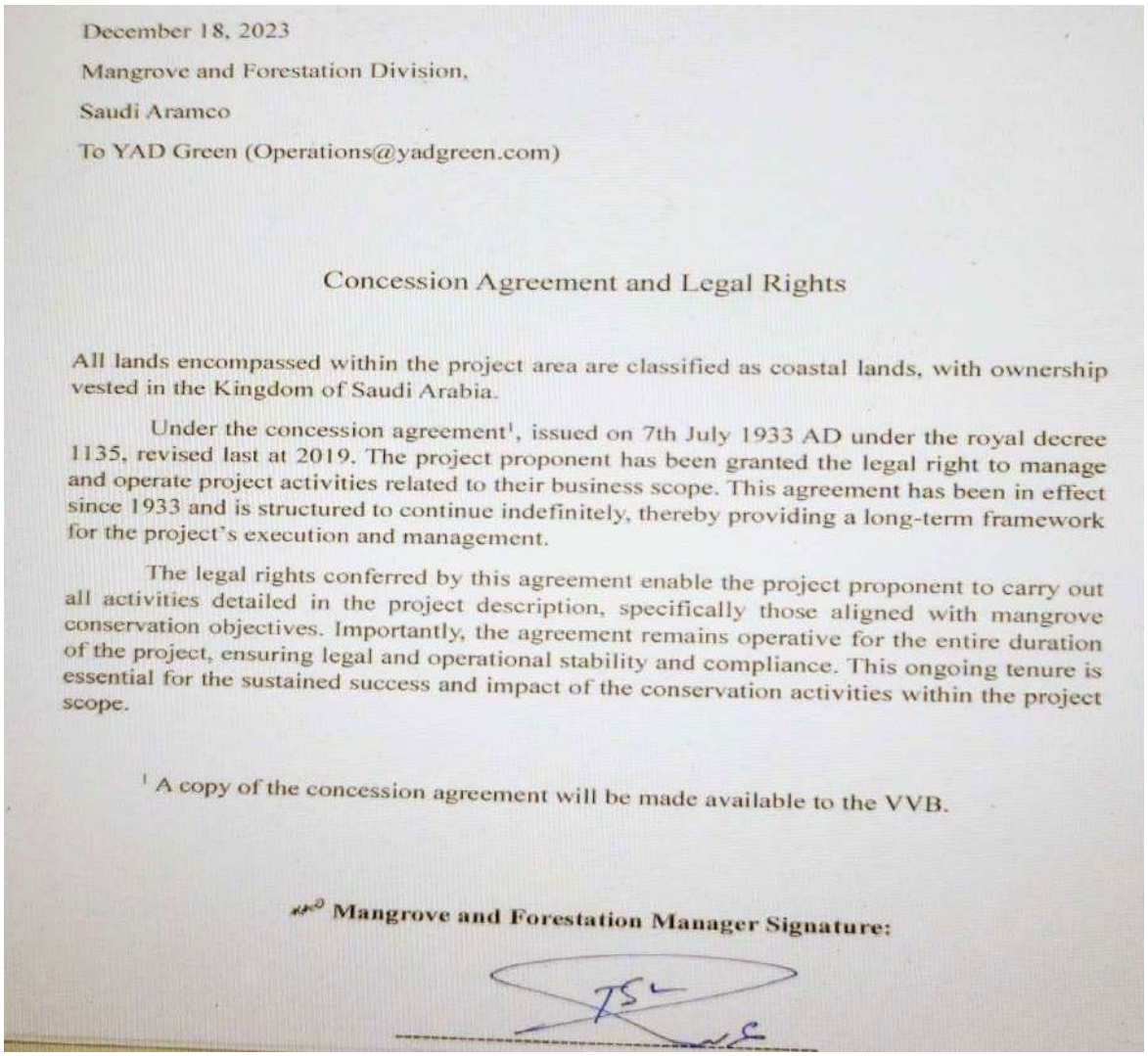
| Furthermore, the frequency of monitoring in the same section has been given as 10 years, which is not in compliance with section 4.10 of the ICR Requirement document v5.0. |
| **Project participant response** **Date:** 13/03/2024 |
| The details regarding the crediting period and monitoring frequency have been updated in the Project Design Document (PDD) to ensure compliance with the ICR Requirement Document v5.0. The crediting period now aligns with the stipulated maximum of 15 years, with the option for renewal up to twice, totaling a maximum of 45 years. Additionally, the monitoring frequency has been adjusted to meet the requirements outlined in section 4.10 of the ICR Requirement document. |
| **Documentation provided by project participant** |
| |
| **VVB assessment** **Date:** 26/03/2024 |
| Based on the review of the ICR PDD, it has been confirmed that the monitoring frequency has been updated to 5 years to align with the ICR requirement. According to the PDD description, project monitoring will commence prior to the project initiation (planting) and will be adjusted every five years from the initial validation. Thereby, VVB confirms that the project follows the ICR guideline for project monitoring as outlined in section 4.10 of the ICR requirement document v5.0.<br><br>As per the ICR PDD section 2.3 the identified crediting period identified as 15 years, renewable twice, making it a total of 45 years. VVB has reviewed the supporting document to ensure that project activities will be continued over the identified crediting period. |



December 18, 2023

Mangrove and Forestation Division,

Saudi Aramco

To YAD Green (Operations@yadgreen.com)

Concession Agreement and Legal Rights

All lands encompassed within the project area are classified as coastal lands, with ownership vested in the Kingdom of Saudi Arabia.

Under the concession agreement[1], issued on 7th July 1933 AD under the royal decree 1135, revised last at 2019. The project proponent has been granted the legal right to manage and operate project activities related to their business scope. This agreement has been in effect since 1933 and is structured to continue indefinitely, thereby providing a long-term framework for the project's execution and management.

The legal rights conferred by this agreement enable the project proponent to carry out all activities detailed in the project description, specifically those aligned with mangrove conservation objectives. Importantly, the agreement remains operative for the entire duration of the project, ensuring legal and operational stability and compliance. This ongoing tenure is essential for the sustained success and impact of the conservation activities within the project scope.

[1] A copy of the concession agreement will be made available to the VVB.

Mangrove and Forestation Manager Signature:

However, PP is requested to provide the concession agreement to confirm the project proponent's ownership over the subject project area.

Further it is requested to provide adequate evidence demonstrating how project proponent ensure to continue mangrove plantation and its management over the technical life of the proposed ICR project.

**CL is still open.**

| **Round 2** | |
|---|---|
| **Project participant response** | **Date:** 26/03/2024 |
| *concession agreement-Arabic (.pdf)* | |
| **Documentation provided by project participant** | |
| | |
| **VVB assessment** | **Date:** 26/03/2024 |

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| PP has provided the requisite concession agreement which has been confirmed by VVB to be valid and applicable.<br><br>**CL has been closed.** |

| **CL** | 16 | **Section no.** | 1.11, ICR PDD (v4.0) | **Date:** 16/01/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per section 1.11 of the ICR PDD, PP shall provide concession agreement with the Ministry of Petroleum and Mineral Resources, granting PP, the legal authority to manage and operate the project activities associated with their business | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Will be provided | | | | |
| **Documentation provided by project participant** | | | | |
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| **VVB assessment** | | | | **Date:** 26/03/2024 |
| PP shall provide the requested concession agreement.<br><br>**CL is still open** | | | | |
| **Round 2** | | | | |
| **Project participant response** | | | | **Date:** 26/03/2024 |
| Concession agreement is attached. | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| The requisite document has been provided by project participant.<br><br>**CL has been closed.** | | | | |

| **CL** | 17 | **Section no.** | 3.8, ICR PDD | **Date:** 15/1/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| In compliance with section 3.8 of the ICR Requirement document v5.0, PP is requested to provide a declaration to demonstrate the following:<br><br>a) The project has not been registered and is not seeking registration under any other GHG programs.<br>b) The project has not been rejected by any other GHG programs.<br>c) The GHG emission mitigations from project will not be used for reporting purposes under the accounting rules set out by the Paris Agreement or other emission trading programs (such as CORSIA) operating under the accounting framework of the Paris Agreement (international trading) | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |

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| Declaration document is attached |
| **Documentation provided by project participant** |
| *DECLARATION* |
| **VVB assessment** \| **Date:** 26/03/2024 |
| Based on the review of the supporting documents provided by project participants, it has been confirmed that the project proponent has submitted a comprehensive official declaration to mitigate any potential double accounting of greenhouse gas (GHG) mitigations from the project. This confirms compliance with the requirements outlined in the ICR Standard v5.0.<br>**CL has been closed.** |

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|---|---|---|---|---|
| **CL** | 18 | **Section no.** | 4.2, ICR PDD | **Date:** 15/01/2024 |
| **Description of CL** | | | | |
| As per section 4.2 of the ICR PDD, PP shall provide evidence for demonstration of applicability of methodology and tools including:<br>• forest/ non-forest analysis to demonstrate that the baseline is degraded mangrove habitat,<br>• SOPs to demonstrate soil disturbance attributable to the project is less than 10%.<br>• list out species included in the project and<br>• Forestation activities do not violate any applicable laws. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| PDD includes a detailed analysis confirming the baseline of degraded mangrove habitat, adherence to Standard Operating Procedures (SOPs) ensuring soil disturbance is kept below 10%, a carefully selected list of native mangrove species aimed at enhancing biodiversity and ecological resilience, and thorough documentation verifying that all forestation activities comply with applicable environmental laws and regulations. | | | | |
| **Documentation provided by project participant** | | | | |
| *SOPs* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| Based on the review of the project description and on-site inspection of the selected project site, VVB confirms that the project activity is eligible to apply the CDM Methodology AR-AM0014 v3.0.<br><br>The species selected for the plantation activity is a native mangrove species i.e., *Avicennia marina* thereby project meets methodological requirement of identifying suitable species for the project region.<br><br>PP has furnished necessary guidelines for planting procedures and guarantees adherence to soil disturbance limits outlined in section 2.2 of methodology AR-AM0014 v3.0 during site preparation for project implementation.<br><br>1. As per the section 2.2 of the applied methodology AR-AM0014 v3.0,<br>*"The land subject to the project activity is degraded mangrove habitat."*<br>PP is requested to provide a digital (GIS-based) map of the project area, including aerial or satellite imagery from at least 10 years prior to the project start date, depicting that the project area comprised of degraded or non-vegetated mangrove habitat. | | | | |

2. A comprehensive description on the environmental laws/rules and regulations of international frameworks applicable to project shall be provided in section 3.1 of the ICR PDD. Further PP shall provide appropriate justification how project is in compliance with the respective environmental laws.

   For instance, when a project involves the restoration of mangrove ecosystems. In this context, it is imperative that the Project Proposal (PP) explicitly outlines how the project aligns with the guidelines set forth by the "RAMSAR" Convention.

**CL is still open.**

**Round 2**

| **Project participant response** | **Date:**26/03/2024 |
|---|---|

1)images are attached
2) Following international laws and regulations are explained in PDD

1. General Environmental Regulation (2001; updated 2020)
2. Environment Regulation, Royal Decree No. M/165 (2020)
3. Ramsar Convention on Wetlands (Ratified in 2003)
4. United Nations Convention on Biological Diversity (CBD) (Acceded in 1996)
5. United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement (Ratified in 1994 and 2016 respectively).

**Documentation provided by project participant**

ICR PDD v2.0

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|

Based on the review of the updated ICR PDD, it is verified that Section 3.1 of the document has been amended to include details regarding relevant international environmental regulations and/or frameworks pertaining to the proposed project, as well as outlining the measures for ensuring project implementation in accordance with these regulations.

**CL has been closed.**

| **CL** | 19 | **Section no.** | 5.1, ICR PDD | **Date:** 15/1/2024 |
|---|---|---|---|---|

**Description of CL**

As per section 5.1 of the ICR PDD, PP shall provide evidence for "Baseline Scenario Assumption" stated as "comprehensive analysis of the current status of carbon sequestration in the region".

| **Project participant response** | **Date:** 21/03/2024 |
|---|---|

To substantiate the "Baseline Scenario Assumption" regarding the continued degradation of mangroves in the absence of our project, Saudi Aramco has conducted a thorough analysis of the current carbon sequestration status in the region. This evidence includes detailed studies involving satellite imagery, historical data analysis, and direct carbon measurement in soil and biomass, providing a clear picture of the declining health of the mangrove ecosystems and their diminishing capacity for carbon sequestration. The findings demonstrate a direct correlation between the absence of conservation efforts and increased carbon emissions, underscoring the critical need for the Dammam DRT Sustainable Wetlands and Mangrove Conservation project.

**Documentation provided by project participant**

*ICR PDD ID137 V 2.1 -DDSWAM*

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|

VVB has reviewed the process outlining the steps followed for identification of baseline scenario and has following observation:

1. Discrepancy in extent of project area.

   - As per section 6 of the ICR PDD,
     "The first plantation activity under this project involving the planting of Avicennia marina mangrove species across 60 hectares in scheduled for April 2028. "
   - As per the section 1.1 of the ICR PDD,
     "The project encompasses an area of approximately 17 hectares, with a substantial portion, specifically 8 hectares, allocated for conservation restoration efforts."

   - As per the DRT_2014 LUC (JPEG file), the total area selected for assessment is 16.4 ha, and as per the DRT_2020 LUC (JPEG file), total area selected is 16.9 ha.

     The information provide for the project area has been found misleading for the reviewer. PP shall address this inconsistency throughout the project documentation.

   Further species shall be designated by their scientific names in accordance with international guidelines.

2. As per the section 6 of the ICR PDD, the baseline scenario 3 identified under Sub-step 1a. is:
   *"If applicable, forestation of at least a part of the land within the project boundary of the proposed A/R CDM project at a rate, 1) Legal requirements; or 2) Extrapolation of observed forestation activities in the geographical area with similar socio-economic and ecological conditions to the proposed A/R CDM project activity occurring in a period since 31 December 1989 as selected by the PPs."*
   It is unclear how the identified alternative land use scenario is credible and applicable for the subject project region.
   PP is requested to provide appropriate justification on how scenario 3 is a plausible alternative land use scenario.

3. In Step 2, the alternative scenarios diverge from those outlined in Sub-step 1a.
   PP is requested to rectify this inconsistency.
   Further PP shall provide comprehensive information regarding barrier analysis, accompanied by supplementary documentation.

4. Following the requirement of applied CDM Tool, it is requested to perform "Step 4: Common Practice Analysis" for the identified baseline scenario.

**CL is still open.**

**Round 2**

| **Project participant response** | **Date:** 27/03/2024 |
|---|---|

Typographical errors are corrected . Common practice analysis is include. Baseline scenario is identified and explained in the PDD

**Documentation provided by project participant**

ICR PDD

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|

1. The discrepancy in project area available for plantation and extent of project area has been addressed throughout the ICR PDD document.
2. Common practice analysis has been described in the ICR PDD.

However, VVB has observed that the baseline scenario demonstration is lacking literature reference and/or basis of selection of barriers identified and common practice analysis.

**CL is still open**

| **Round 3** | |
|---|---|
| **Project participant response** | **Date:** 08/04/2024 |
| | |
| **Documentation provided by project participant** | |
| Revised ICR PDD: *08.04 ICR PDD ID137 V 2.2 clean.* | |
| **VVB assessment** | **Date:** 09/04/2024 |
| VVB, based on the review of the revised ICR PDD confirms that section 6 "Baseline scenario" has been updated to reflect the credibility and basis of the barrier identified for respective alternative land use scenario.<br><br>The information and/or reference provided are valid and acceptable to the VVB.<br><br>**The CL has been closed.** | |

| **CL** | 20 | **Section no.** | ICR PD | **Date:** 15/1/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PP shall provide SOPs and planting management plan for the proposed project. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| | | | | |
| **Documentation provided by project participant** | | | | |
| • PLANTATION SOP<br>• seed survival rate SOP | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| PP has presented supporting SOPs to execute plantation and seedling establishment. However, the information provide does not include project specific requirements.<br><br>Project participant is requested to provide information on following particulars:<br><br>• Information covering several key areas, such as: Site Selection, Species Selection, Seed Sourcing, Water Management, source of mulch and organic compost.<br>• Planting density followed (or planned) for the subject species along with reference/source for basis of assumption.<br>• Procedure or management plan in place to ensure seedling acclimatization in the subject region.<br>• What will be the irrigation schedule for seedling establishment?<br>**CL is still open.** | | | | |

| Round 2 | |
|---|---|
| **Project participant response** | **Date:** 23/03/2024 |

For the mangrove restoration project in Dammam, Saudi Arabia:

Site Selection

The optimal site for *Avicennia marina* mangrove restoration near Dammam was chosen based on several key factors:

- Salinity and Tidal Influence: The selected area features moderate salinity levels and appropriate tidal exposure, closely mimicking the natural habitat of Avicennia marina. This allows for natural watering and sediment deposition, essential for mangrove growth.
- Soil Type: Sandy to muddy substrates rich in organic matter were selected to support the healthy growth of mangroves.
- Historical Presence: Locations with a history of mangrove presence, now degraded due to human activities or natural causes, were given preference.
- Ecological Impact: The site was chosen for its potential to enhance biodiversity, protect shorelines, and provide habitats for marine and terrestrial wildlife.

Species Selection

*Avicennia marina* was selected for its:

- Native Species: Adaptability to the region's climate and soil conditions, ensuring a higher success rate for the restoration.
- Ecological Benefits: Significant contributions, including carbon sequestration, shoreline stabilization, and support for marine biodiversity.
- Resilience: Ability to thrive in high salinity levels and varying water conditions, ideal for Dammam's environmental challenges.

Seed Sourcing

Avicennia marina seeds are sourced from:

- Local Populations: Ensuring genetic diversity and adaptability by collecting seeds from healthy, local populations.
- Harvesting Time: Collection takes place during the fruiting season to ensure viability and readiness for germination.
- Sustainability: Employing sustainable collection methods to prevent harm to source populations.

Water Management

Tailored strategies meet the needs of young mangroves:

- Irrigation: Supplemental irrigation may be required initially, especially in areas with infrequent tidal inundation, to simulate natural wetting and drying cycles.
- Monitoring: Soil moisture and salinity levels are regularly monitored, ensuring practices align with optimal growth needs.

- Adaptation Period: The ultimate goal is to minimize human intervention as mangroves adapt to natural water availability and tidal patterns.

Mulch and Organic Compost

Crucial for soil health, sourced locally to ensure suitability for the saline environment and avoid introducing contaminants. Examples include date palm leaves and fish waste compost, which enhance soil fertility without harming the ecosystem.

Planting mangroves at a spacing of 1m x 1m in arid regions offers numerous ecological and environmental benefits. This spacing strategy enhances survival and growth rates by minimizing competition for sunlight, nutrients, and water—resources that are scarce in arid environments. Additionally, it promotes water efficiency, facilitating better root spread and access to moisture, which is essential for mangroves that depend on specific soil moisture and salinity levels. Moreover, such spacing optimizes the carbon sequestration capabilities of mangroves, known for their significant carbon storage capacity. This approach also contributes to biodiversity, creating healthier mangrove ecosystems that support a wide array of wildlife and transform these areas into biodiversity hotspots. Furthermore, strategically spaced mangroves are crucial for shoreline protection and erosion control, especially important in coastal arid regions where soil retention and reduction of wave energy are needed. The decision for this spacing measurement was informed by reviewing research on various projects worldwide. Few literature references are provided below and attached for further information.


- Lewis, R.R. 2005. Ecological Engineering for Successful Management and Restoration of Mangrove Forests." Ecological Engineering 24(4): 403-418.
- Bosire, J.O., et al. 2008. "Functionality of restored mangroves: A review." Aquatic Botany 89(2): 251-259.
- https://doi.org/10.1016/j.ecss.2011.07.009
- https://doi.org/10.21203/rs.3.rs-2217608/v1
- http://dx.doi.org/10.22617/TIM189796-2


**Seedling Acclimatization Management Plan for Avicennia marina in Saudi Arabia**

1. Seed Collection

- Collect seeds from mature Avicennia marina in/near the region.

2. Initial Nursery Growth

- Plant seeds in a nursery with conditions mimicking natural habitat.

- Monitor growth and ensure seedlings develop strong root systems.

3. Gradual Acclimatization

- Slowly expose nursery-grown seedlings to outdoor conditions over 2-4 weeks.

- Gradually introduce soil and water with increasing salinity levels to match site conditions.

4. Monitoring for Stress

- Regularly check seedlings for stress indicators (e.g., wilting, discoloration).

- Adjust acclimatization process based on seedling response.

5. Transportation to Site

- Carefully transport acclimatized seedlings to the restoration site, maintaining moisture.

6. Transplantation

- Plant seedlings at 1m x 1m spacing in prepared sites.

- Implement immediate post-planting care, including adequate watering.

7. Post-Transplant Monitoring and Care

- Continue monitoring seedlings for adaptation signs, providing necessary care.

- Use temporary shading to protect from excessive sunlight if needed

IRRIGATION SCHEDULE

Initial irrigation post-transplantation should be more frequent to support the young mangroves in adapting to their new environment, typically daily for the first week, gradually reducing to twice a week as the seedlings show signs of successful acclimatization and start to exhibit new growth—usually after a month. This schedule aligns with recommended practices for mangrove restoration in arid and semi-arid regions, ensuring seedlings receive adequate moisture while encouraging root development and resilience against drought conditions . Monitoring soil moisture and adjusting irrigation based on seasonal variations and observed plant health is crucial for the long-term success of these seedlings as they transition to relying on natural water sources. (REFERENCES: Ellison, 2000; "Mangrove Restoration – Costs and Benefits of Successful Ecological Restoration," Bosire et al., 2008, https://doi.org/10.21203/rs.3.rs-2217608/v1

**Documentation provided by project participant**

Reference documents

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|

Based on the review of the supporting evidence/reference and justification provided, it has been confirmed that the project proponent/participant is committed to facilitate mangrove restoration in the subject region with the intention of positively changing the ecosystem conditions and support mangrove habitat.

The information provided on procedure planned to be followed during mangrove plantation is valid and acceptable for the VVB.

**CL has been closed.**

| **CL** | 21 | **Section no.** | 5.1, ICR PDD | **Date:** 15/1/2024 |
|---|---|---|---|---|

**Description of CL**

As per section 1.1 of the ICR PDD, It has been stated that

“Enabling new channels is crucial for increasing water flow to restoration areas.”

The above activity could lead to alteration of native ecosystem. PP shall demonstrate how the above statement is in compliance with section 4.2.1 of the ICR Requirement document v5.0.

| **Project participant response** | **Date:** 13/03/2024 |
|---|---|

By ‘Enabling new channel’ does not intends to create new channel but modifying the existing channels by removing the debris and desilting the existing channel. The statement is paraphrased to avoid confusion .

**Documentation provided by project participant**

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|
| As per the document "PLANTATION SOP":<br><br>Site preparation includes:<br><br>1. Clear the site of debris and non-native vegetation.<br>2. Ensure proper hydrology of the site is restored or mimicked for mangrove growth.<br>3. Map the site and mark planting spots, ensuring appropriate spacing.<br>PP is requested to provide detailed information of the steps planned to execute site preparation for plantation of *Avicennia marina* in the project area.<br><br>**CL is still open.** | |
| **Round 2** | |
| **Project participant response** | **Date:** 23/03/2024 |
| The details are included and SOP is modified to version 2 dtd 23/03/2024 | |
| **Documentation provided by project participant** | |
| Plantation SOP version 2 is attached | |
| **VVB assessment** | **Date:** 26/03/2024 |
| VVB has reviewed the **"***PLANTATION SOP TC 23.03.2024 (.docx)-Revised"* and confirms that adequate information has been provided to indicate the process of site preparation with minimum possible disturbance to native ecosystem and necessary details regarding the anticipated planting density for Avicennia *marina*.<br><br>**CL has been closed.** | |

| **CL** | 22 | **Section no.** | 1.5, ICR PDD | **Date:** 15/1/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per section 1.5 of the ICR PDD,<br><br>*"This includes assessing the impact of conservation and restoration activities on the ecosystem and determining the effectiveness of these efforts in mitigating greenhouse gas emissions."*<br><br>PP shall demonstrate what other activities are being employed in the region, other than mangrove plantation, to restore hydrological condition and soil conditions. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Project activity includes only mangrove plantation. However other activities that are included in the project area are 1. Long-term Ecosystem Monitoring,2. Debris Management,3. Water Flow Enhancement,4. Sustainable Eco-Tourism Promotion,5. Conditioning the dispersal centres. which promotes conservation of the existing mangroves ,but is not claimed as project activity for gaining credits. | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |

| |
|---|
| The requisite information has been provided in the latest version of ICR PDD document to reflect information on technology applied (now under section 1.6 of ICR PDD v2.10 for the proposed project.<br><br>VVB confirms that information on project specific technological operations, outlining parameters of field monitoring and laboratory analysis, techniques planned to be employed for plantation and maintenance of native mangrove species, and advanced monitoring approach for future projections (of Carbon flux, ecosystem health and soil carbon status) in the project region.<br><br>**The CL has been closed.** |

| **CL** | 23 | **Section no.** | ICR PDD | **Date:** 24/1/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| The following documents are either missing or incomplete:<br><br>1. Shape files (with geodetic polygons) for total project area, eligible project area and plantation area.<br><br>2. Condition prior to project (LUF files) of 2010,2015 and 2020 as demonstration of applicability of the applied methodology (AR-AM 0014).<br><br>3. Evidence of title of the land for the entire project lifetime and crediting period<br><br>4. Evidence of carbon credit ownership and no double counting.<br><br>5. Evidence in support of NPR report for all associated risks and mitigation<br><br>6. Declaration from PP that project (and any of its area) is not under any other GHG program at any stage.<br><br>7. Contract of the plantation along with implementation schedule<br><br>8. Evidence of the start date (day when the project started GHG removal (mitigation action for LUF projects) of the project activity.<br><br>9. Documents of ongoing grievance addressal mechanism.<br><br>10. SOPs of Aramco and Yadgreen for mangrove plantation, MRV, re-plantation, EHS etc.<br><br>11. Records of training and capacity building of plantation and MRV personnel along with CVs.<br><br>12. Records of already planted area with photographs<br><br>13. Photos and videos of pre-project scenario (before the start of planation)<br><br>14. Sources (including scientific literatures, baseline study, project study, SOC laboratory records etc.) used for the purpose of calculation of carbon calculation spread sheet. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Concerened documents are attached | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |

The following documents has been received with adequate information:

1. Declaration from PP that project (and any of its area) is not under any other GHG program at any stage.
2. Evidence of the start date (day when the project started GHG removal (mitigation action for LUF projects) of the project activity.
3. SOPs for Mangrove Planting and project monitoring.
   Sources (including scientific literatures, baseline study, project study, SOC laboratory records etc.) used for the purpose of calculation of carbon calculation spread sheet.
4. Rest of the information have been sufficiently demonstrated under respective sections of the ICR PDD and or justification of the proceeding CLs.

**PP is requested to provide remaining requisite information/documentation:**

1. KML/Shape files (with geodetic polygons) for total project area, eligible project area and plantation area.
2. Concession agreement to confirm title of the land for the entire project lifetime and crediting period.
3. Evidence of carbon credit ownership.
4. Evidence in support of NPR report for all associated risks and mitigation
5. Evidence of the start date (day when the project started GHG removal (mitigation action for LUF projects) of the project activity.
6. Documents of ongoing grievance addressal mechanism.

**CL is still open.**

**Round 2**

| **Project participant response** | **Date:** 26/03/2024 |
|---|---|

1.Kml files are attached

2.Concession agreement is provided to VVB

3.Letter of credit ownership duly signed from ARAMCO representative is attached.

4.Research papers and literature review proving species considered for plantation is native is attached

5.As the project is yet to be started, undertaking by Project proponent is provided.

6. procedure of existing grievance addressal mechanism is given

**Documentation provided by project participant**

1. Revised KML Files: (i) *DRT AREA 2014 CONVERTED (2)*
(ii) *DRT AREA 2018*

(iii) *DRT AREA LULC (2)*

2. *concession agreement-Arabic (.pdf)*
3. *credit ownership - DD SWAM-scan (.pdf)*
4. *Justification on NPR analysis under CAR 08*
5. *Grievance Addressal Process-scan (.pdf)*
6. Literature: (i) Reforestation_of_grey_mangroves_Avicennia_marina_a,
(ii) Mangrove Ecosystem of Saudi Arabian Red Sea Coast- An Overview

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|

Project participant has provided all the necessary information along with supporting documents. The details provided have been found to be sufficiently substantiating project design description and comply with ICR requirements.

**CI has been closed.**

| Round 3 | |
|---|---|
| **Project participant response** | **Date:** DD/MM/YYYY |
| | |
| **Documentation provided by project participant** | |
| | |
| **VVB assessment** | **Date:** DD/MM/YYYY |
| | |

| **CL** | 24 | **Section no.** | Baseline re-evaluation | **Date:** 22/03/2024 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per the section 3.4.2 of ICR requirement document v.5.0:<br><br>"*Renewal of Crediting Period*<br><br>*Project proponents may apply at the end of the current crediting period to renew the crediting period, subject to conformity to all future requirements, update of the PDD, re-evaluating baseline scenarios using tools and methodologies in effect at the time of renewal, and validation by an approved VVB."*<br><br>PP shall present a baseline Land use analysis report along with supporting evidence for the time prior to expected project start date. | | | | |
| **Project participant response** | | | | **Date:** 08/04/2024 |
| | | | | |
| **Documentation provided by project participant** | | | | |
| Revised KML files and JPEG files | | | | |
| **VVB assessment** | | | | **Date:** 09/04/2024 |
| VVB based on the review of updated documentation including KML files depicting land use cover in the project area and further the temporal change from the year 2014 to 2020 within in the project boundary.<br><br>**CL is closed.** | | | | |

**Table 3. CAR from this validation**

| **CAR** | 01 | **Section no.** | 1.3, ICR PDD | **Date:**15 /01/2024 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| PP has used Verra methodology (VM0033) and CDM methodology (AR-AM0014). VVB noted that VM0033 is not an approved methodology under ICR. Furthermore, PP has not listed all applicable<br>CDM tools, its compliance and has not utilised it for the application of CDM methodology. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |

| |
|---|
| PDD and calculation sheet is updated with the ICR approved methodology and calculation tools - CDM |
| **Documentation provided by project participant** |
| *ICR PDD ID137 V 2.1 -DDSWAM* |
| **VVB assessment** **Date:** 26/03/2024 |
| Section 4 of the ICR PDD has been revised to incorporate the requested information. PP has sufficiently outlined the methodology employed and its relevance to the proposed project. Additionally, PP has enlisted all the methodological tools planned to apply for project implementation and monitoring.<br><br>**The CAR has been closed.** |

| | | | | |
|---|---|---|---|---|
| **CAR** | 02 | **Section no.** | | **Date:** 19/1/2024 |
| **Description of CAR** | | | | |
| PP shall refer to the latest version of the ICR requirements and guidance documents. Accordingly, PP shall revise the ICR PDD on the latest ICR template available at https://documentation.carbonregistry.com/documentation/. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Document is changed to latest version of the ICR template | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| PP has provided the project description using latest available version of the ICR PDD template. VVB, confirms that the information provided is in adherence with the requirements of the template instructions.<br><br>**CAR has been closed.** | | | | |

| | | | | |
|---|---|---|---|---|
| **CAR** | 03 | **Section no.** | Project Design Description | **Date:** 19/1/2024 |
| **Description of CAR** | | | | |
| Details on cover page of the ICR PDD is incomplete including details for project ID and first date of submission. PP shall complete the template in line with ICR PDD template instructions.<br><br>While doing so, PP shall provide full name under “Project Proponent” for “Saudi ARAMCO”. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| Details are filled up | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |

| |
|---|
| The ICR PDD has been updated to reflect the requisite corrections in the document.<br><br>**The CAR has been closed.** |

| **CAR** | 04 | **Section no.** | 3.1, ICR PDD | **Date:** 19/1/2024 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| As per section 3.1 of the ICR PDD, PP shall list out relevant local, regional, and national laws, statutes, and regulatory frameworks and demonstrate compliance with the ICR template instructions. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| The project operates within the framework of the Saudi Arabian Environment Law (Royal Decree No.M/165 of 2020), which mandates environmental protection and sustainable use. It also adheres to the National Strategy for Conservation of Biodiversity, focusing on in-situ and ex-situ conservation, and aligns with the Saudi Green Initiative's goals for emissions reduction, afforestation, and land and sea protection . | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| In section 3.1 of the ICR PDD, PP has provided a comprehensive detail of national environmental regulation applicable for the subject project and how project meets the pertinent requirement.<br><br>**Therefore, CAR has been closed.** | | | | |

| **CAR** | 05 | **Section no.** | 3.3, ICR PDD | **Date:** 19/01/2024 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| Section 3.3 of ICR PDD is not in compliance with the ICR template instructions (v4.0). | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| PDD is updated | | | | |
| **Documentation provided by project participant** | | | | |
| *ICR PDD ID137 V 2.1 -DDSWAM*<br><br>*stakeholder consultation report* | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |

The Project Participant has submitted the revised ICR PDD along with supporting documentation detailing stakeholder consultation and its outcomes.

However, PP is requested to address following specifics:

- List of attendees of the subject stakeholder consultation meeting.
- Stakeholder identification process.

**CAR is still open.**

| **Project participant response** | **Date:** 23/03/2024 |
|---|---|

- The Saudi Arabian Oil Company (Saudi Aramco) has the concession rights and management responsibilities of project area. No community resides in and near to the project region. The Ras Tanura Producing Department (RTPD) within the Northern Area Oil Operation (NAOO)-which is a department of Saudi Aramco form the only population operating within and near the project area and thus are the only stakeholders relevant to the day-to-day activities. Environmental Protection (EP) of Saudi Aramco oversee and manage the implementation of project, and the plantation and monitoring of mangroves within Company Kingdom operations.
- Due to privacy reasons, PP is unable to provide a detailed list of attendees.

However, we assure that the consultation was inclusive, involving key representatives from various departments and levels of expertise. The categories of participants included but were not limited to:

1. Department Managers
2. Naoo (Nature Conservation Department)
3. RTPD (Research, Technology, and Project Development)
4. EP (Environmental Protection)
5. Top Management Representatives: executives and senior leaders
6. Engineers
7. Field Workers.
8. Environmental Specialists

| **Documentation provided by project participant** |
|---|
| |

| **VVB assessment** | **Date:** 26/03/2024 |
|---|---|

Based on the justification provided by project participants, a thorough review of the ICR PDD, and observations made during on-site inspections, it is confirmed that all relevant stakeholders have been actively engaged in consultation meetings. Accordingly, the project process aligns with the ICR requirements for safeguarding the interests of stakeholders involved in the proposed project.

**CAR has been closed.**

| **CAR** | 06 | **Section no.** | Ex-ante Carbon Calculation sheet | **Date:** 24/01/2024 |
|---|---|---|---|---|
| **Description of CAR** | | | | |

1. In line with section 3.4 of the ICR requirement v4.0, PP is requested to provide vintage wise breakup of GHG mitigation contributions from the project activity in the Carbon Calculation spreadsheet as well as under section 1.6 and 8.2 of the ICR PDD.
2. VVB has observed that the ex-ante spreadsheets for baseline and/or with project scenario GHG quantification includes information on area of conservation.

   PP is requested to provide information on project area (ha) that have been covered under mangrove ecosystem conservation at the time of project validation along with GIS image or KML Shapefile to substantiate the same.
   PP is requested to explain the basis for identification of project area under conservation, with the type of activities implemented upon project initiation in the region.

3. Some of the parameter values have been found to be hardcoded in the Carbon calculation spreadsheet.

   For Example: In Excel Sheet "soil bsl", value of $CH_4$ ($GHG_{BSL\text{-}soil\text{-}CH4,i,t}$ ( t C yr 1)) and $N_2O$ ($GHG_{BSL\text{-}soil\text{-}N2O,i,t}$ ( t C yr 1)) emissions from the SOC pool in the project scenario in stratum 1 has been hardcoded.

   PP is requested to provide source for such parameters for which a constant value has been applied or conservatively taken as 0 (zero) along with justification for selecting the respective default/constant values.

4. The value for the parameter "Default mean annual increment of above-ground biomass in forest in the region or country where the A/R CDM project activity is located; (Δbforest)" in the baseline and project scenario has been selected as 1.3.
   In line with, Table 3A.1.5 of the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry 2023 https://www.ipcc.ch/site/assets/uploads/2018/03/GPG_LULUCF_FULLEN.pdf)

   PP is requested to clarify on the factors considered for the selection of default value as 1.3. Such as type of forest/ season and age class considered for the subject mangrove ecosystem along with reference to substantiate the same.

5. VVB has observed that in some of the spreadsheet for Ex-ante calculations the parameter description provided for project scenario mentioned the description of baseline or vice versa.

   For instance: in spreadsheet "soil wps" comment for cell E1, for parameter: $C\%_{WPS\text{-}emitted,i,t}$ is mentioned as: *Organic carbon loss due to oxidation, as a percentage of C mass present in in-situ soil material in the baseline scenario in stratum i in year t; %.* Whereas the data/values included in the subject spreadsheet are meant for the project scenario (WPS: With Project Scenario).

   PP is requested to correct this editorial misstatement to avoid any confusion for the reviewer. Further PP is requested to follow the same for rest of the spreadsheets.

| **Project participant response** | **Date:** 13/03/2024 |
|---|---|
| Necessary corrections are done | |
| **Documentation provided by project participant** | |
| *ICR PDD ID137 V 2.1 -DDSWAM*<br><br>*137 DD SWAM -CALCULATION MODEL* | |
| **VVB assessment** | **Date:** 26/03/2024 |

PP has provided the revised documentation reflecting the requisite information and/or correction in the carbon calculation spreadsheet and ICR PDD.

VVB confirms alignment of information in the ICR PDD and carbon calculation spreadsheet with AR-AM0014 v3.0 methodology, validating its applicability to the proposed project. Therefore, the information provided is valid and acceptable to the VVB.

**CAR has been closed.**

| **CAR** | 07 | **Section no.** | 1.3, ICR PDD | **Date:** 24/01/2024 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| VVB during the on-site inspection noted that the PP included conservation area as well in the total project area. Please note that the project using CDM methodology AR AM0014 falls under ARR category, and any credits generated out of conservation is not allowed.<br><br>In the above background, PP is requested to re-visit the project design to include the total area, eligible area and plantation area which falls under A/R activities only. Furthermore, the implementation schedule as well as Carbon Calculation should be revised accordingly. | | | | |
| **Project participant response** | | | | **Date:** 13/03/2024 |
| The updated PDD only considers the ARR component as per the methodology. | | | | |
| **Documentation provided by project participant** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 26/03/2024 |
| The project description has been revised to comply with the requirement of applied methodology and associated tools.<br>**CAR has been closed.** | | | | |

| **CAR** | 08 | **Section no.** | Permanence Risk Analysis | **Date:** 22/03/2024 |
|---|---|---|---|---|
| **Description of CAR** | | | | |

As per ICR requirement document v5.0, section 4.8.2,

*"Project proponents may use a relevant current good practice guidance risk assessment tool[36] or rely on ISO 31000 to assess the non-permanence risk."*

PP is requested to provide a comprehensive Non-Permanence Risk Analysis Report. Further the pertinent description shall be provided for:

- Tool applied for non-permanence risk analysis and reporting.
- Basis for selecting a risk factor.
- Justification for each risk factor identified.
- Mitigation measure in place to address respective risks selection.
- Supplementary documentation for each risk factor or mitigation measures identified for the project activity.

| **Project participant response** | **Date:** 23/03/2024 |
|---|---|

In Dammam, we have conducted a comprehensive Non-Permanence Risk Analysis report. This report adheres to the ICR requirement document v5.0 and ISO 31000 Risk Management Principles and Guidelines , ensuring a methodical approach to risk management that is integral to our project's success and sustainability.

Tool Applied for Non-Permanence Risk Analysis:

The NPR report utilized a custom risk assessment tool that aligns with the principles of ISO 31000. This choice was made to accurately reflect the specific risks and challenges associated with mangrove restoration projects. The tool's relevance and effectiveness lie in its comprehensive and integrated approach, tailored to our project's unique context and objectives.

ISO 31000 Principles in Risk Analysis:

I**ntegrated**: Our risk management process is an integral part of all organizational processes, including strategic planning, project execution, and continuous monitoring. This ensures that risk considerations are embedded in decision-making at all levels.

**Comprehensive:** The risk management approach is structured and tailored specifically to our mangrove restoration project, taking into account the project's environmental, socio-economic, and operational context.

**Inclusive:** We engaged a wide range of stakeholders in the risk analysis process, including project management, local communities, environmental experts, and policy makers. This inclusivity ensured transparency and incorporated diverse perspectives into risk assessment and mitigation strategies.

**Dynamic**: The risk management process is responsive to change. It is designed to be adaptable, allowing for the incorporation of new information, changes in the project environment, or unforeseen events, ensuring the resilience and flexibility of our project.

**Continual Improvement**: Our approach to risk management encourages ongoing learning and improvement. Based on continuous monitoring, evaluation, and stakeholder feedback, we adjust and refine our risk management strategies to enhance project outcomes.

**Identify Risks**: We identified specific internal, external, and natural risks, providing a clear basis for their selection. This includes considerations of species adaptability, project management experience, financial viability, community engagement, political stability, and natural risks such as fire, pests, extreme weather, and geological risks.

[36] Good practice guidance can come from a recognized origin, such as industry practices and associations, similar projects, benchmarking, GHG program tools, or others that are fit for the purpose of risk assessment.

**Evaluate Probability and Determine Severity:** For each identified risk, we evaluated its probability and potential impact, employing criteria that reflect the severity of consequences for project permanence and environmental integrity. This informed our prioritization of risks and corresponding mitigation measures.

**Mitigation Measures to Address Risks:**

For every risk identified, we have implemented or planned specific mitigation measures. These measures are designed to manage, reduce, or eliminate risks, aligning with our project's long-term goals and sustainability. This includes:

Adopting native species proven to be adapted to local ecological zones.

Ensuring a strong presence and engagement of the management team within the project area.

Leveraging Saudi Aramco's financial commitment to ensure project's financial viability.

Regular monitoring and adaptive management plans to respond to project activities and stakeholder consultations.

Supplementary Documentation:

Our report is accompanied by comprehensive documentation for each risk factor and mitigation measure identified. This includes detailed project plans, monitoring data, records of stakeholder consultations, legal agreements, and financial commitment evidence, underscoring our approach to managing non-permanence risks.

| **Documentation provided by project participant** |
|---|
| |

| **VVB assessment** | **Date:** 27/03/2024 |
|---|---|

Based on the review of ICR PDD and justification provided VVB has observed:

1. Tool Applied for Non-Permanence Risk Analysis:
   In accordance with ICR guidelines the permanence risk assessment for the subject project has been aligned with ISO 31000 principles. VVB confirms that the approach followed is valid and applicable for the proposed ICR project.
2. Following the guideline of ISO 31000 Principles in Risk Analysis, PP has appropriately demonstrated the potential risk factors and respective risk management approach subject to project implementation in the region.
3. Mitigation measures have been outlined for each identified risk, demonstrating a proactive approach to risk management.
4. PP has provided supplementary documentation accompanying the report, including project plans, monitoring methodology, stakeholder engagement, legal agreements, and financial evidence. This indicates transparency and thoroughness in documenting the risk management process.

**CAR has been closed.**

## IV. Abbreviations

| | |
|---|---|
| **AGB** | Above Ground Biomass |
| **AR** | Afforestation and Reforestation |
| **AQL** | Acceptable Quality Limit |
| **BE** | Baseline Emission |
| **BGB** | Below Ground Biomass |
| **CAR** | Corrective Action Request |
| **CCIPL** | Carbon Check (India) Private Limited |
| **CL** | Clarification Request |
| **$CO_2e$** | Carbon Di-oxide Equivalent |
| **DR** | Document/Desk- Review |
| **DVR** | Draft Validation and Verification Report |
| **DW** | Dead Wood |
| **EF** | Emission Factor |
| **ERs** | Emission Removals |
| **EIA** | Environmental Impact Assessment |
| **FA** | Final Approval |
| **FAR** | Forward Action Report |
| **FVR** | Final Validation and Verification Report |
| **GHG** | Green House Gas(es) |
| **GIS** | Geographical Information System |
| **ICCs** | International Carbon Credit |
| **ICR** | International Carbon Registry |
| **IPCC** | Intergovernmental Panel on climate Change |
| **IR** | Internal Resource |
| **ISO** | International Organization for Standardization |
| **KML** | Keyhole Markup Language |
| **LE** | Leakage Emission |
| **LULC** | Land Use Land Cover |
| **MP** | Monitoring Plan |
| **MR** | Monitoring Report |
| **PDD** | Project Design Description |
| **PP** | Project Proponent |
| **QA/QC** | Quality Assurance/ Quality Control |
| **Saudi Aramco** | Audi Arabian Oil Co. |
| **SDGs** | Sustainable Development Goals |
| **SOC** | Soil Organic Carbon |
| **SOPs** | Standard Operating Procedures |
| **$tCO_2e$** | Tons of Carbon di Oxide Equivalent |
| **TR** | Technical review/ Technical Reviewer |
| **VVB** | Validation and Verification Body |
| **WRC** | Wetland Restoration and Conservation |
| **YADGREEN** | YADGREEN Agriculture Co. |

## V. Certificate of Competence

Carbon CHECK

**Carbon Check (India) Private Limited**

*Certificate of Competency*

**Mr. Vijay Mathew**

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☒ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☒ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☒ SDG+ | ☒ Social no-harm(S+) | ☒ Environment no-harm(E+) | |
| ☒ Local Expert for India | | | |

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☐ TA 1.1 | ☒ TA 1.2 | ☐ TA 2.1 | ☒ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☒ TA 13.1 | ☒ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | ☐ TA 16.1 | | |

**Issue Date**
**5th December 2023**

**Expiry Date**
**31st December 2024**

Priya Suman

Ms. Priya Suman
Compliance Officer

Sanjay Agarwalla

Mr. Sanjay Kumar Agarwalla
Technical Director

**Revision History of the document:**

| Revision date | Summary of changes |
|---|---|
| 2022[1] | Annual revision |
| Jan 2023 | Annual revision |
| Dec 2023 | Change in the template due to revision in TA and function |

CCIPL_FM 7.9 Certificate of Competency_V4.0_112023

[1] Please refer to previous version of FM 7.9 for the revision history

Carbon CHECK

# Carbon Check (India) Private Limited

## Certificate of Competency

### Mr. Vikash Kumar Singh

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☒ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☒ Plastic Waste Expert |
| ☒ CCB Expert | ☐ Legal Expert | ☒ Financial Expert | ☒ Environmental, Health and Safety financial matters |
| ☒ SDG+ | ☒ Social no-harm(S+) | ☒ Environment no-harm(E+) | |

☒ Local Expert for India/RSA and Spanish speaking countries

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☒ TA 1.1 | ☒ TA 1.2 | ☐ TA 2.1 | ☒ TA 3.1 | ☒ TA 4.1 |
| ☒ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☒ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☒ TA 13.1 | ☒ TA 13.2 |
| ☒ TA 14.1 | ☒ TA 15.1 | ☐ TA 16.1 | | |

**Issue Date**

**5th December 2023**

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**31st December 2024**

Priya Suman

Ms. Priya Suman
**Compliance Officer**

Sanjay Agarwalla

Mr. Sanjay Kumar Agarwalla
**Technical Director**

**Revision History of the document:**

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| 2022[1] | Annual revision |
| Jan 2023 | Annual revision |
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CCIPL_FM 7.9 Certificate of Competency_V4.0_112023

[1] Please refer to previous version of FM 7.9 for the revision history

Carbon CHECK

# Carbon Check (India) Private Limited

## Certificate of Competency

### Ms. Shweta Semwal

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☒ Validator | ☒ Verifier | ☐ Team Leader | ☒ Technical Expert |
| ☐ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☐ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☐ SDG+ | ☐ Social no-harm(S+) | ☐ Environment no-harm(E+) | |
| ☒ Local Expert for India | | | |

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☐ TA 1.1 | ☐ TA 1.2 | ☐ TA 2.1 | ☐ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☐ TA 13.1 | ☐ TA 13.2 |
| ☒ TA 14.1 | ☒ TA 15.1 | ☐ TA 16.1 | | |

**Issue Date**

**5th December 2023**

**Expiry Date**

**31st December 2024**

Priya Suman

Ms. Priya Suman
**Compliance Officer**

Sanjay Agarwalla

Mr. Sanjay Kumar Agarwalla
**Technical Director**

**Revision History of the document:**

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|---|---|
| Dec 2023 | Initial Adoption |

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[1] Please refer to previous version of FM 7.9 for the revision history

Carbon CHECK

# Carbon Check (India) Private Limited

## Certificate of Competency

### Mr. Amit Anand

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☒ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☒ Plastic Waste Expert |
| ☒ CCB Expert | ☐ Legal Expert | ☒ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☒ SDG+ | ☒ Social no-harm(S+) | ☒ Environment no-harm(E+) | |
| ☒ Local Expert for India and RSA | | | |

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☒ TA 1.1 | ☒ TA 1.2 | ☐ TA 2.1 | ☒ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☒ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☒ TA 13.1 | ☒ TA 13.2 |
| ☒ TA 14.1 | ☒ TA 15.1 | ☐ TA 16.1 | | |

**Issue Date**

**5th December 2023**

**Expiry Date**

**31st December 2024**

Priya Suman

Ms. Priya Suman
Compliance Officer

Mr. Sanjay Kumar Agarwalla
Technical Director

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| 2022[1] | Annual revision |
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| Dec 2023 | Change in the template due to revision in TA and function |

CCIPL_FM 7.9 Certificate of Competency_V4.0_112023

[1] Please refer to previous version of FM 7.9 for the revision history