INDIA SUNDARBANS MANGROVE RESTORATION

Report No. 10473SD

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TÜV SÜD South Asia Pvt. Ltd.
Environmental Technology, Carbon Management Service
Solitaire, I.T.I. Road, Aundh, Pune- 411007, INDIA

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Prepared By	Certification Body “Environment and Energy”, TÜV SÜD South Asia
Contact	TÜV SÜD South Asia Pvt. Ltd. Environmental Technology, Carbon Management Service Solitaire, I.T.I. Road, Aundh, Pune- 411007, India
Approved By	Eswar Murty (Certification Body)

Work Carried Out By	Dr. Dhanya Nambiar (Technical Reviewer)
	Martin Opitz (Assessment Team leader & GHG Auditor)

Summary:

TÜV SÜD South Asia Pvt. Ltd. (TÜV SÜD) has performed the verification of the VCS project activity "India Sundarbans Mangrove Restoration" against the VCS Version 3 and all applicable requirements therein, for the monitoring period from 1 March 2015 to 31 March 2018.

The project activity consists of a reforestation of a mangrove habitat located in Indian Sundarbans. The CDM afforestation and reforestation Large-scale Methodology: AR-AM0014 "Afforestation and reforestation of degraded mangrove habitats, version 3.0." and corresponding tools are applied to quantify the GHG removals achieved in this project.

Livelihoods Fund (Project Proponent) has requested TÜV SÜD to perform the 2nd VSC verification audit, for which a Monitoring Report, a Non-Permanence-Risk Report and supporting documents were provided. TÜV SÜD, acting as an independent third party, has assessed the documents and evidences provided, and performed an on-site assessment, which included a desk review, a site visit to the project area and a series of interviews with the technical and field staff. TÜV SÜD verified the information contained and the emissions reductions and/or removals claimed in the Project Implementation Report, calculated in compliance with the requirements of the Verified Carbon Standard (VCS) and the requirements of the methodology applied.

In total three Corrective Action Request and one Forward Action Request were raised.

After performing the verification audit, TÜV SÜD confirms that the Project complies with all the requirements of the Verified Carbon Standard, having generated 119,139 t CO2 equivalents net emission reductions during the present reporting period, after discounting 15% for buffer.

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1 INTRODUCTION

1.1 Objective

Livelihoods Venture has commissioned an independent verification by TÜV SÜD South Asia Pvt. Ltd. (TÜV SÜD) of its listed VCS project: "India Sundarbans Mangrove Restoration" for the 2nd monitoring period from 01-03-2015 until 31-03-2018.

The objective of the verification work is to comply with the requirements of the VCS for verification (VCS Standard version 03). Per this assessment, TÜV SÜD shall:

- ensure that the project activity has been implemented and operated as per the registered PD "India Sundarbans Mangrove Restoration", and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place,
- ensure that the published Monitoring and Project Implementation Report and other supporting documents provided are complete, verifiable and in accordance with applicable VCS requirements,
- ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology.
- Evaluate the data recorded and stored as per the AR-AM0014 "Afforestation and reforestation of degraded mangrove habitats, version 3.0.

1.2 Scope and Criteria

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the Validation Verification Body (VVB) approved auditor respectively. The verification is based on the submitted combined VCS Monitoring Report respectively, the validated project design documents including its monitoring plan and validation report, the applied monitoring methodology, relevant decisions, clarifications and guidance from VCS and any other information and references relevant to the project activity's resulting emission reductions. These documents are reviewed against the requirements of the VCS, including:

- VCS Program Guide version 3.7
- VCS Standard version 3.7 and other relevant requirements defined by VCSA
- AFOLU Requirements version 3. 6
- CDM AR-AM0014, version 3.0

TÜV SÜD has applied a rule-based approach for the verification of the project. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.
The verification considers both quantitative and qualitative information on emission reductions.

The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the monitoring activities.

1.3 Level of Assurance

The verification report expresses a conclusion with a reasonable level of assurance about whether the reported net anthropogenic GHG removals data is free from material misstatement. TÜV SÜD applied a materiality threshold of 5% with respect to omission or misstatements concerning reported quantities. This has been calculated based on the fact that the project is a VCS "Large Project", generating less than 300,000 tons of GHG reductions per year and is hence subject to the 5% materiality threshold, as per VCS standard, section 5.3.1 4).

1.4 Summary Description of the Project

Project activity:	"India Sundarbans Mangrove Restoration"
VCS project ID and Registry:	1463
Project Participants:	Livelihoods Fund
Location of the project:	The grouped project is located in West Bengal district, India, in the South of the Dampier Hodges line, between the following co-ordinates: Latitude: 21° 30´ - 22°45´ N Longitude: 88°00´-89°05´ E
Starting date of the crediting period:	March 1st, 2015

"India Sundarbans Mangrove Restoration" is a A/R project activity located in Indian Sundarbans Mangrove Forests. The project area covers 4,588 ha. The project duration is 20 years.

The 2nd monitoring period is from March 1st 2015 to March 31st 2018. In this period a net carbon emission reduction of 140,164 tCO_2-equivalent has been determined, which results in 119,139 VCUs excluding the 15 % buffer (IRL 4,5,6).

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Process

The verification process is based on the approach depicted in the VCS Standard documents.

Standard auditing techniques have been adopted for the verification process. The verification team performs first a desk review, followed by an on-site visit and the consideration of any comments received during the assessment, which results in the formation of a protocol that includes all the findings. The next step involves the evaluation of the findings through direct communication with the PPs and then finally the preparation of the verification report. This verification report and other supporting documents then undergo an internal quality control by the Certification Body "Environment and Energy" of TÜV SÜD, before final submission of the verification report.

Verification Team

The appointment of the verification team takes into account the technical area(s), sectoral scope(s) and relevant host country experience required amongst team members for verifying the ER achieved by the project activity in the relevant monitoring period for this verification.

The CB TÜV SÜD operates the following qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL);
- Verifier (V);
- Verifier Trainee (T);
- Technical Experts (TE).

The verification team consisted of the following members:

Name	Qualification	Coverage of scope	Coverage of technical area	Coverage of financial aspect	Host country experience
Martin Opitz	ATL, V	☑	☑	NA	☑

Technical reviewer is Dr. Dhanya Nambiar. Dr. Dhanya Nambiar is covering the technical area 14.1 - forestry for the review

2.2 Document Review

The VCS Monitoring Report (version 01) was submitted by the PP to TÜV SÜD in July 2018, together with a set of supporting documents and spreadsheets. The MR was assessed by the audit team based on all the relevant supporting documents. The aim of the assessment in the desk review was to:

- verify the completeness of the data and the information presented in the MR; and
- check the compliance of the MR with respect to the monitoring plan depicted in the registered PD and verify that the applied methodology (and applicable modules and tools) was followed. Particular attention to the quality of the UVA (unmanned aerial vehicle/drone) measurement including calibration requirements, and the quality assurance and quality control procedures was paid,
- evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.
- A complete list of all documents reviewed is available in annex 2 of this report. The final VCS MR is version 2.0, dated 11 Nov 2018.

2.3 Interviews

Between July 29th and August 3rd, 2018, TÜV SÜD performed interviews with project stakeholders and a physical site inspection to confirm relevant information and to resolve issues identified in the first document review. The table below provides a list of persons interviewed in this context:

Name	Organisation
Ajanta Dey	Project coordinator
Sourav Bera	Carbon Monitoring coordinator
Keshab Ghosh	Field officer in charge
Biswajit Mondal	Field officer / Bidya Zone
Chandan Maity	Field officer / Saptamukhani Zone

Paritosh Giri	Field officer / Surveillance
Muktaram Sardar	Chairman / Badabon Farmers Producer Company Limited
Gopinath Halder	Field supervisor / Matla
Sukdev Sarbar	Field supervisor / Matla
Bhagabat Sasivcal	Mangrove Steward
Pran Krishna Jana	Mangrove Steward
Prabir Mondal	Field Supervisor / Sagar
Tapan Dinda	Mangrove Steward
Metodi Panev	Consultant Unique Forestry and Landuse
Sharaf Ali Khan	Mangrove Steward
Haradhan Roy	Mangrove Steward

Besides the listed person community members and administrative staff in the project area have been interviewed in the course of the onsite visit.

2.4 Site Inspections

Between July 29th and August 3rd, 2018, TÜV SÜD performed a physical site inspection to:

- confirm the implementation and operation of the project; and
- review the sample design, measurement of sample plots and the data flow aggregating and reporting the monitoring parameters; and
- confirm the correct implementation of procedures for operations and data collection; and
- cross-check the information provided in the MR documentation with other sources; and
- check the monitoring equipment against the requirements of the PD/MR and the approved methodology, including calibrations, maintenance, etc.; and
- review the calculations and assumptions used to obtain the GHG data and ER; and
- identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.

The site inspections were carried out including the physical inspection of a sub-set of the sample plots assessed as part of the PP´s monitoring procedures (IRL 15, 16, 17).

2.5 Resolution of Findings

The objective of this phase of the verification process is to resolve any outstanding issues, which require clarification for TÜV SÜD's conclusion of the achieved GHG emission reduction. The findings raised as Forward Action Requests (FARs) (if any) indicated in previous reports (validation/verification) were discussed during this phase and, issues raised in the FARs were resolved, during communications between the PP and TÜV SÜD.

Concerns raised in the desk review, the on-site audit assessments and the follow up interviews and the responses provided for the raised concerns are documented in Annex 1 (verification protocol) to guarantee the transparency of the verification process.

A Corrective Action Request (CAR) is raised where TÜV SÜD identifies:

- non-conformities in monitoring and/or reporting with the monitoring plan and/or methodology;
- that the evidence provided is not sufficient to prove conformity;
- mistakes in assumptions, data or calculations that impair the ER;

- FARs stated during validation that are not solved until the on-site visit.

A Clarification Request (CL) is raised where TÜV SÜD does not have enough information or the information is not clear in order to confirm a statement or data.

Information or clarifications provided as a response to a CAR or CL could also lead to a new request.

2.5.1 Forward Action Requests

A Forward Action Request (FAR) is raised where TÜV SÜD identifies that monitoring and/or reporting require special attention or adjustments for the next verification period.

In total one FAR was raised in the course of the 2nd verification concerning the measurement of the tree height. the measurement of the height was done along the tree trunk, which leads to the measurement of the length, but not the height of the tree. The height measurement is not of importance for the calculation of the stem volume as the allometric equation applied is using the dhb only. Nevertheless, if the height measurements shall be used in the future for other types of assessments, it would be advisable to measure the real height and not the length as the height is normally used for different types of calculations und assessments in forest science.

2.6 Eligibility for Validation Activities

TÜV SÜD is a validation/verification body which holds accreditation for validation for the relevant sectoral scope under the VCS Program.

3 VALIDATION FINDINGS

Not applicable, as the project is the second regular verification of the initial instance.

No gap validation is required; no methodology deviations were needed in the verification; and no new instances were added to the project activity.

3.1 Participation under Other GHG Programs

This section is not applicable as the project does not seek registration under other approved GHG program. No changes since validation/verification (IRL 14).

3.2 Methodology Deviations

Not applicable.

3.3 Project Description Deviations

For the 2nd monitoring period a deviation regarding the inventory is applied and respectively described in the MR. Due to the different growth conditions and thus different growth performance a re-stratification, delineation and division of existing plots into different plot IDs took place. Further the project proponents switched from permanent to temporary sampling points. This makes sense against the backdrop of a rapidly changing habitat, such as mangrove forests. The described deviation does neither affect the additionality, nor the scale of project activity, nor the applicability/application of the methodology applied and is as such in compliance with the CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD EB 67, Annex 48 and thus in compliance with the VCS Standard, section

3.6.1. Further the described changes are in full compliance with the CDM Guideline on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents EB 66, Annex 24.

3.4 Grouped Project

The project activity and thus the project area has increased to 4,588 ha, i.e. by 184 ha. The new activity instances meet the eligibility criteria set out for inclusion as presented in the PD, section 1.13. The total potential project area, including areas where new project activity instances may be developed in the future have been verified during validation as well as their eligibility criteria for inclusion. Further the applicability conditions as set out in the Methodology for the entire project area have also been verified during the validation (IRL 3). During the onsite visit the total project area was travelled through and inspected (IRL 16)

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity is completely operational and the same has been confirmed on-site (IRL 16).

The project is implemented according to the description presented in the registered PD. Different growth performances due to different growth conditions have led to the deviations mentioned in the previous sections (3.3) of this report.

The verifier confirms, through the visual inspection that all physical features of the proposed VCS project activity including data collecting, analysing and storage systems have been implemented in accordance with the registered PD and the above described and accepted deviations. The verifier confirms, to the best of his knowledge, that the GHG emission reductions generated by the project have not become included in an emissions trading program or any other mechanism that includes GHG allowance trading. Furthermore, confirms that the project has not received or sought any other form of environmental credit, or has become eligible to do so since validation or previous verification; and that the project has not participated or been rejected under any other GHG programs since validation or previous verification.

The implementation status of the project is described in detail in the MR and could be confirmed in the course of the on-site inspection (IRL 16).

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

Compliance of the Monitoring Plan with the Monitoring Methodology

The monitoring plans provided in the PD (IRL 2) is in accordance with the approved methodology AR-AM0014 as well as all applicable tools, applied by the VCS project activity.

Compliance of the Monitoring with the Monitoring Plan

The monitoring has been carried out in accordance with the monitoring plan presented in the registered PD. All parameters contained in the monitoring plan were reviewed by the audit team respectively and found to be monitored according to the registered PD.

The monitoring plan is provided consisting of different processes that as a conjunction represent the monitoring system of the project. The following processes/monitoring are mentioned:

I. Establishment of survival counts and replanting
   - ⇨ Assessment of survival rate

II. Livelihoods Standard Monitoring
   - ⇨ Standard monitoring of all livelihood's projects

III. Geographic coordinates of the project boundary
   - ⇨ Monitoring of boundaries

IV. Identification and monitoring of strata
   - ⇨ Stratification of project area dependent on growth and survival performance

V. Mangrove carbon inventory (Actual carbon monitoring)
   - ⇨ Plot selection & location
   - ⇨ Data collection
   - ⇨ Quality Assurance/Quality Control
     - o Procedures to ensure reliable field measurements
     - o Procedures to verify field data collection
     - o Maintenance and storage

During the onsite visit the audit team assessed the result of the procedures I, II, IV and V, mainly focusing on the last one, the actual carbon monitoring (IRL 1, 2, 3, 8, 9, 18).

Assessment of Data and Calculation of Greenhouse Gas Emission Reductions

The required data for the monitoring was available, and the parameters were monitored in accordance with the registered monitoring plan, considering the deviations described above.

The data collection was conducted by manual measurements in the field. The dbh as well as the height (see FAR 2018-01) as measured using measuring tapes and measurement poles for the project trees as well as pre-project trees. Besides the trees the number of saplings were counted. The data was collected manually as well as via a monitoring app and smartphones. A detailed description of the data generation, storing, processing and aggregating, collating and reporting is described in the MR and the corresponding SOP (IRL 09). During the onsite visit the data collection, processing, collating and reporting was demonstrated and discussed in depth (IRL 06, 13, 15).

The data collected during the onsite visit, replicating the exact same methodology as described in the MR and subsequent documents was subject to a statistical analysis. An F-test of equality of variances was conducted for the two sets of dbh mean values of each sub sample plot obtained during the actual monitoring and the field visit. As the test value was smaller than the F-value both variances origin from the same population. Thus, there is no significant difference between the differences of the two separate measurements (IRL 15, 16, 17).

Baseline emissions were quantified in line with Equation (1) of the applied methodology (AR-AM0014).

Strata 1 - 3 ("Zero Baseline Biomass")

Carbon stock and carbon stock changes in baseline tree and non-tree biomass within the strata 1 - 3 ("Zero Baseline Biomass") were accounted for as zero in line with A/R Methodological Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 04.2.) as all conditions described in section 5 of the respective tool are met. Thus, no changes since 1st verification.

Strata 4 ("Dwarf mangrove baseline biomass")

Carbon stock in baseline tree and non-tree biomass within strata 4 ("Dwarf mangrove baseline biomass") was estimated according to the A/R Methodological Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 04.2.) following the crown cover approach. Details of the estimation of the determination of the pre-existing tree crown cover respectively the existing shrub crown cover is described in the PD respectively the 1st verification. The quantifications applied are in line with equation (26) respectively equation (20) and subsequent equations. Thus, no changes since 1st verification.

Baseline carbon in dead wood is estimated according to the A/R Methodological Tool "Conservative default-factor debased method for estimation of carbon stock in dead wood" (Version 3.1) applying the conservative default-factor based method described in section 6.2. The quantification applied is in line with equation (9) and subsequent equations. Thus, no changes since 1st verification.

Changes in the carbon stocks in baseline trees and shrub biomass including dead wood were accounted for as zero in line with A/R Methodological Tool "Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities" (Version 04.2.) as all conditions described in section 5 of the respective tool are met. Thus, no changes since 1st verification.

The project emissions were quantified in line with Equation (2) of the applied methodology (AR-AM0014).

Changes in carbon stock in tree biomass is quantified in line with methodological tool Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities (AR-TOOL14) following equation (12) and subsequent equations. For the quantification of the change in carbon stock in tree biomass the PP applied two allometric equations for I) trees and II) saplings. To demonstrate appropriateness of allometric equations for estimation of aboveground tree biomass in A/R CDM project activities applying the homonymous methodology (EB 65, Annex 28). Thus, no changes since 1st verification.

Change in carbon stock in shrub biomass have not been accounted for at this second verification as they haven't been actively introduced into the project area. This is considered a conservative approach as potentially shrub vegetation will be growing in the project area. Thus, no changes since 1st verification.

Change in carbon stock in dead wood is calculated in line with equation (9) and subsequent equations using the conservative default-factor based method included in section 6.2. of estimation of carbon stocks and change in carbon stocks in dead wood and litter in A/R CDM project activities (AR-TOOL12). Thus, no changes since 1st verification.

Change in carbon stock in the soil organic carbon is quantified in line with equation (4) of the applied methodology (AR-AM0014). Thus, no changes since 1st verification.

The uncertainty of the estimation of the GHG removals is calculated in line with equations (1) and (2) of AR-TOOL14. Due to an uncertainty of 19% a discount rate of 25% of the uncertainty is applied in line with Appendix 2 of AR-TOOL14.

The audit team confirms that the methods and formulae used to estimate the baseline and project emissions are appropriate. The calculation was done in accordance with the methods and formulae described in the registered monitoring plan and applicable methodology (IRL 1, 2, 3, 6, 13, 15, 17).

The audit team confirms that the monitoring report includes all required and relevant parameters. The parameters have been measured at the intervals required by the applied methodology and monitoring plan.

The audit team confirms that all the assumptions, emission factors and default values have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report.

In all cases, the audit team assessed the procedures follow by the PP in order to acquire, collate, transpose and process the data sets. The audit team found that the GHG emission reductions were quantified correctly in accordance with the project description and the applied methodology as well as all the applicable modules and tools (IRL 06, 15).

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Among several evidence items submitted, the following relevant and reliable evidence material was used by the audit team during the verification process:

- GIS files (IRL 8)
- Calculation spreadsheets (IRL 6)
- QA/QC on Parcels (IRL 13)

Sufficient evidence covering the full verification period in the required frequency is available to validate the figures stated in the final MR. The source of the evidence was discussed in chapter 2 of this report. Specific cross-checks have been done in cases that further sources were available.

The monitoring report's figures were checked by the audit team against the raw data (IRL 17). The data collection, transcription and processing system meet the requirements of the monitoring plan as per the methodology in terms of sufficiency of the quantity and appropriateness of quality of the evidence used to determine the GHG emission reductions.

4.4 Non-Permanence Risk Analysis

The risk assessment for this monitoring period was conducted according to the "AFOLU Non Permanence Risk Tool". Each risk category was calculated based on the VCS guidance and the input provided by the PPs. The information was validated and cross-checked through document and literature review, onsite visits of the project area and interviews conducted. Following the VCS guidance, a buffer of 15% is determined.

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
Internal Risk				
1. Project Management				
a. Species planted (where applicable) associated with more than 25% of the stocks on which GHG credits have previously been issued are not native or proven to be adapted to the same or similar agro-ecological zone(s) in which the project is located.	1, 4, 5	The species being planted are dominated at approximately 80–90% by Avicennia species. Other species include: Rhizophora, Bruguiera, Ceriops, Xylocarpus, Excoecaria, Aegiceras and Aegialitis species. All of these are native species. This could be observed during the onsite visit, no changes since 1st verification.	**0**	**0**
b. Ongoing enforcement to prevent encroachment by outside actors is required to protect more than 50% of stocks on which GHG credits have previously been issued.	1, 4, 5, 18	NEWS is a community and stakeholder wise very active NGO. Focus of its work but also for this project is the empowerment of communities and collaboration with all relevant stakeholders to replant/restore and maintain the mangrove ecosystem based on a good understanding and appreciation of the importance of the ecosystem in order to i) re-establish but also i) ease the pressure on the mangrove forest in the Sundabarns. This could be sustained during the onsite visit via interviews as well via a visit of the Ramganga Training Center, no changes since 1st verification.	**0**	**0**
c. Management team does not include individuals with significant experience in all skills necessary to successfully undertake all project activities (ie, any area of required experience is not covered by at least one individual with at least 5 years' experience in the area).	1, 4, 5	NEWS has a track record of restoration work of habitats and wildlife of more than 20 years in the Sundarbans. This could be sustained during the onsite visit via interviews, no changes since 1st verification.	**0**	**0**
d. Management team does not maintain a presence in the country or is located more than a day of travel from the project site, considering all parcels or polygons in the project area.	1, 4, 5	NEWS has their main office in Kolkata, less than 4 hours by car from the start of the Sundarbans. All project areas are located about 4-5 hours' journey from the office of the management team. Zonal project coordinators are permanently based in each of the project zones responsible for all project activities including community sensitization, plantation campaigns and monitoring (with continuous support from the management team in Kolkata). This could be sustained during the onsite visit via interviews as well as observations, no changes since 1st verification.	**0**	**0**
e. Mitigation*: *Management team includes individuals with significant experience in AFOLU project design and implementation, carbon accounting and reporting (eg, individuals who have successfully managed projects through validation, verification and issuance of GHG credits) under the VCS Program or other approved GHG programs.	1, 4, 5	The project developer (NEWS) and the project proponent (Livelihoods Fund) both have developed the capacity to design this AFOLU project, account for carbon removals, and report and participate in validation and verification under respective VCS methodology and standard requirements. This could be sustained during the onsite visit via observations and interviews, no changes since 1st verification.	**-2**	**-2**

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
***f. Mitigation*:** *Adaptive management plan in place.*	1, 4, 5, 18	The project has adaptive operational, monitoring, roll out, feedback, supervisory, and internal control systems in place. NEWs is periodically physically monitoring the projects sides, in a constant consultations process with communities, governance institutions, via PRAs, etc. and involved in scientific collaborations with local scientist as well as international mangrove think tanks such as IUCN. Risk are analysed and when needed mitigation measures conducted. Further Livelihoods is regularly monitoring all its carbon projects in order to assess progress and identify bottlenecks to successful project implementation.	**-2**	**-2**
Total Score Project Management			**-4**	**-4**
2. Financial Viability				
a. Project cash flow breakeven point is greater than 10 years from the current risk assessment	1, 4, 5	n.a.	**0**	**0**
b. Project cash flow breakeven point is between 7 and up to 10 years from the current risk assessment	1, 4, 5	Breakeven point has been calculated to be reached in 6 years from the current risk assessment, as indicated in the cash flow supporting document	**0**	**0**
c. Project cash flow breakeven point between 4 and up to 7 years from the current risk assessment	1, 4, 5, 19	Breakeven point has been calculated to be reached in 6 years.	0	1
d. Project cash flow breakeven point is less than 4 years from the current risk assessment	1, 4, 5	n.a.	**0**	**0**
e. Project has secured less than 15% of funding needed to cover the total cash out before the project reaches breakeven	1, 4, 5	n.a.	**0**	**0**
f. Project has secured 15% to less than 40% of funding needed to cover the total cash out required before the project reaches breakeven	1, 4, 5	n.a.	**0**	**0**
g. Project has secured 40% to less than 80% of funding needed to cover the total cash out required before the project reaches breakeven	1, 4, 5		**0**	**0**
h. Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven	1, 4, 5	n.a.	**0**	**0**
i. Mitigation: *Project has available as callable financial resources at least 50% of total cash out before project reaches breakeven*	1, 4, 5, 11	Livelihoods Fund has 100% of needed funding secured for this VCS project. This was confirmed in the last Livelihoods board of investors meeting in Dec 2014.	**-2**	**-2**
Total Score Financial Viability			0	**0**
3. Opportunity Cost				

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
a. NPV from the most profitable alternative land use activity is expected to be at least 100% more than that associated with project activities; or where baseline activities are subsistence-driven, net positive community impacts are not demonstrated	1, 4, 5	n.a.	**n.a.**	**n.a.**
b. NPV from the most profitable alternative land use activity is expected to be between 50% and up to100% more than from project activities	1, 4, 5	n.a.	**n.a.**	**n.a.**
c. NPV from the most profitable alternative land use activity is expected to be between 20% and up to 50% more than from project activities	1, 4, 5	n.a.	**n.a.**	**n.a.**
d. NPV from the most profitable alternative land use activity is expected to be between 20% more than and up to 20% less than from project activities; or where baseline activities are subsistence-driven, net positive community impacts are demonstrated	1, 4, 5, 18, 20	Based on the recently published World Bank Report 'Building Resilience for Sustainable Development of the Sundarbans' (2014), the population of the Sundarbans blocks is primarily engaged in subsistence agriculture, and the great majority of farmers are classified as "small" and "marginal," with typical landholdings of less than 1 ha per family. NEWS with its livelihoods and community approach is intended to bring about net positive community impacts both in the short run and on a long-term basis via: trainings on improved animal husbandry, introduction of improved cook stoves, the restoration of the mangrove forests (cost protection/ Cyclone Aila), etc. This could be sustained during the onsite visit via interviews and observations, no changes since 1st verification.	**0**	**0**
e. NPV from project activities is expected to be between 20% and up to 50% more profitable than the most profitable alternative land use activity	1, 4, 5	n.a.	**n.a.**	**n.a.**
f. NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity	1, 4, 5	n.a.	**n.a.**	**n.a.**
g. Mitigation: *Project proponent is a non-profit organization*	1, 4, 5	Livelihoods Fund SICAV SIF is a carbon fund, who does not market, sell or make any profit with the carbon offsets. It merely distributes them to its investors. NEWS is an environmental charity (NGO) registered with the government of India	**-2**	**-2**
h. Mitigation: *Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over the length of the project crediting period*	1, 4, 5	See details in the next table (section b)	**-2**	**-2**

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
i. Mitigation: *Project is protected by legally binding commitment (see Section 2.2.4) to continue management practices that protect the credited carbon stocks over at least 100 years*	1, 4, 5	n.a.	**n.a.**	**n.a.**
Total Score Opportunity Cost			**-4**	**-4**
4. Project Longevity				
Without legal agreement or requirement to continue the management practice	1, 4, 5	n.a.	**n.a.**	**n.a.**
With legal agreement or requirement to continue the management practice	1, 4, 5, 10	The project area is legally designated as a protected area. Harvesting is prohibited. It is a legal requirement to protect and maintain the planted/naturally regenerated trees. The land use is also legally defined by the Land and Forest Protection Committee (Bhumi Raksha Committee) and local Panchayats. Further the contracts between NEWS and Livelihoods include a management plan with an application period of 50 years since the starting date of the project (2010-2060). It specifies: after the first monitoring campaign, a first period of ten years (2015-2024) is covered by a contractual agreement signed between Livelihoods and NEWS to support capacity buildings of farmers, surveillance and progressive gain of autonomy; the next 20 years (2025-2044) are covered by the same agreement which will be renewed every ten years, at least 2 times. No changes have occurred since 1st verification.	**5**	**5**
Total Score Project Logevity			**5**	**5**
Summary Internal risk				
Project Management			-4	**-4**
Financial Viability			0	**0**
Opportunity Cost			-4	**-4**
Project Longevity			0	**0**
TOTAL			0	**0**
External risk				
5. Land Tenure				
a. Ownership and resource access/use rights are held by same entity(s)	1, 4, 5	n.a.	**n.a.**	**n.a.**
b. Ownership and resource access/use rights are held by different entity(s) (eg, land is government owned and the project proponent holds a lease or concession)	1, 4, 5	As described in section 1.12.1 of the Project Description, NEWS selected suitable planting areas which are owned by the government, and land use is defined by the Land and Forest Protection Committee (Bhumi Raksha Committee) and local Panchayats. The communities have also embraced the mangrove restoration project. No changes have occurred since 1st verification.	**2**	**2**
c. In more than 5% of the project area, there exist disputes over land tenure or ownership	1, 4, 5	Access/use rights are clearly defined. Disputes over land tenure or ownership do not exist., No changes since 1st verification.	**0**	**0**

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
d. There exist disputes over access/use rights (or overlapping rights)	1, 4, 5	Access/use rights are clearly defined. Disputes over land tenure or ownership do not exist., No changes since 1st verification.	**0**	**0**
e. WRC projects unable to demonstrate that potential upstream and sea impacts that could undermine issued credits in the next 10 years are irrelevant or expected to be insignificant, or that there is a plan in place for effectively mitigating such impacts.	1, 4, 5, 11	Potential impacts undermining issued credits in the next 10 years will be irrelevant and/or mitigated. 1. The project area is located in Ganges-Brahmaputra-Megha system is the second largest hydrological system after the Amazon. It is unlikely that the flow will be significantly be affected by any large derivation or dam further upstreams. Further the areas are located in costal wetland that are legally protected. 2. NEWs has selected the plantations areas in low risk areas in order to avoid loss due to erosion, details are explained in the PD. 3. The areas are widely distributed, so that a significant loss of the total area is very unlikely. No changes have occurred since 1st verification.	**0**	**0**
f. Mitigation: *Project area is protected by legally binding commitment (eg, a conservation easement or protected area) to continue management practices that protect carbon stocks over the length of the project crediting period*	1, 4, 5	The project area is designated as a protected area. Once restored, the trees will not be harvested or removed as they are legally protected from such actions. No changes since 1st verification	**-2**	**-2**
g. Mitigation: *Where disputes over land tenure, ownership or access/use rights exist, documented evidence is provided that projects have implemented activities to resolve the disputes or clarify overlapping claims*	1, 4, 5	n.a.	**0**	**0**
Total Score Land Tenure			**0**	**0**
6. Community Engagement				
a. Less than 50 percent of households living within the project area who are reliant on the project area, have been consulted	1, 4, 5	There are no households living inside the project area. This could be sustained during the onsite visit via interviews and observations. No changes since 1st verification.	**n.a.**	**n.a.**
b. Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted.	1, 4, 5, 19	NEWS is conduction consultations via the village governing institutions (Panchayats). These consultations involve all villages in and around the project area and are organized through the Panchayats. When selecting sites/plots for the project, a systematic process of consultation is also undertaken in the area. As a result, households are voluntarily participating in the project activities, e.g., in collection of seeds, nursery raising, plantation and livelihood activities. This could be sustained during the onsite visit via interviews and observations. No changes since 1st verification.	**n.a.**	**n.a.**
c. Mitigation: *The project generates net positive impacts on the social and economic well-being of the*	1, 4, 5	The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area as explained in section 1 (Opportunity cost) of this document. Further a due diligence	**-5**	**-5**

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
local communities who derive livelihoods from the project area		review was presented during the onsite visit (Dr Jack Ruitenbeek (Consultant to IUCN), Somenath Bhattacharyya (Senior Wetlands Advisor, Institute of Environmental Studies and Wetland Management, Kolkata), and Dr Lalit Banerjee (Mangrove Wetland Specialist, Joint Director (retired) Botanical Survey of India), concluding that the project activities and that 'the project would qualify for 9 of 9 required criteria and 2 of 3 optional "Gold Level" criteria under the Climate, Community and Biodiversity Alliance Standard No changes since 1st verification.		
Total Score Community Engagement			**-5**	**-5**
7. Political Risk				
Governance score		The data provided in the document of the PP is not the most recent data. The audit team has calculated the most recent values with the following result: Governance score is -0.25	**2**	**2**
f. Mitigation: *Country is implementing REDD+ Readiness or other activities, as set out in this Section 2.3.3 of VCS AFOLU Non-Permanence Risk Tool v. 3*	1, 4, 5	India has an established Designated National Authority under the CDM and has at least 14 registered CDM Afforestation/Reforestation project. This project has received a Letter of Approval from the DNA. No changes since 1st verification.	**-2**	**-2**
Total Score Political Risk			**0**	**0**
Summary External risk				
Land Tenure			**0**	**0**
Community Engagement			-5	**-5**
Political Risk			**0**	**0**
TOTAL			**0**	**0**
8 Natural risk				
a. Are all natural risk factors applicable to the project been assessed using the Likelihood and significance (LS) and mitigation (M) (if any) approach? (See Table 10 of VCS Non-Permanence tool v.3)	1, 4, 5	Respective information has been provided.	**0**	**0**
8.1 Fire Risk				
Has evidence been provided for assessing the risk of fire occurring in the project area?	1, 4, 5	N.a. Mangroves	**0**	**0**
8.2 Pest and diseases outbreaks				
Has evidence been provided for assessing the risk of incidence of pests and disease attack?	1, 4, 5, 18	93% of the plantation areas were rated as either no insect attack or very insignificant insect attack for the years 2014 and 2015. To mitigate the risk, the project is applying a mixed multi-species approach and is periodically monitoring the planted areas. Significance = Minor Likelihood = Less than every 10 years Mitigation = 0.5	**2.5**	**2.5**
8.3 Extreme weather				

CHECKLIST QUESTION	Ref.	COMMENTS	Draft Concl	Final Concl
Has evidence been provided for assessing the risk of extreme climatic events (e.g. floods, droughts, winds, frost) occurring?	1, 4, 5, 20	The Sundarbans are under risk of cyclones. Nonetheless the mangrove habitat is very well adapted on cyclones Significance = Minor Likelihood = Less than every 10 years	**2**	**2**
8.4 Geological risks				
Has evidence been provided for assessing the geological risk (e.g. volcanoes, earthquakes, landslides)?	1, 4, 5, 20	Erosion that occur in large-scale hydrological systems is one of the most severe risks the project activity is facing. The mangroves can not prevent the erosion but contribute to the long-term system stability. NEWS is applying a criteria based site-selection procedures to avoid areas under high risk for the project activity. The selection process was discussed in depth during the onsite visit. Significance = Major Likelihood = Less than every 10 years Mitigation = 0.5	**10**	**10**
8.5 other natural risk				
Are there any other natural risks identified for the project area? Has evidence been provided for assessing these risks?	1, 4, 5	n.a.	**0**	**0**
Summary Natural risk Determined by (LS × M)				
Fire (F)			0	0
Pest and Disease Outbreaks (PD)			**2.5**	**2.5**
Extreme Weather (W)			**2**	**2**
Geological Risk (G)			**10**	**10**
Other natural risk (ON)			0	0
TOTAL			**14.5**	**14.5**

Overall Risk Rating

Risk Category	Rating
a) Internal Risk	**0**
b) External Risk	**0**
c) Natural Risk	**14.5**
Overall risk rating (a + b + c)	**15**

5 SAFEGUARDS

5.1 No Net Harm

The project activity consists of a reforestation of a mangrove habitat located in Indian Sundarbans. The project area was a degraded land without vegetation but in the intertidal zone with scattered mangroves trees (bare soils close to mature mangroves in steady state or degrading). The only current land use is related with wetlands´ non forest products (fish, shellfish, oyster and crab). The project activity aims to restore degraded wetlands and to improve soil and environmental conditions, restoring ecological, economic and social services of degraded mangroves within the Sundarban. It consists of the replanting of the lost mangrove forest only and does not include any commercial utilization of the timber or any related goods. Thus, no negative environmental and socio-economic impacts are identified (IRL 1, 3, 4).

5.2 Local Stakeholder Consultation

As the project activity has no negative environmental and socio-economic impacts no negative or critical stakeholder comments have been received by the project proponent (IRL 18).

6 VERIFICATION CONCLUSION

TÜV SÜD South Asia Pvt. Ltd. performed the secvond periodic verification of the VCS project: “India Sundarbans Mangrove Restoration”. The verification is based on the currently valid documentations of the VCS.

The management of the Livelihoods Fund in collaboration with NEWS signs responsible for the preparation of the GHG emissions data and the reported GHG emission reductions on the basis set out within the project’s Monitoring Plan indicated in the VCS Project Description version 5.0, dated 10 June 2015 and the applied CDM Methodology AR-AM0014 version 3.0

The verifier can confirm that:

- the development and maintenance of records and reporting procedures are in accordance with the registered monitoring plan;
- the project is operated as planned and described in the project design document;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements;
- the monitoring plan in Monitoring and Implementation Report is as per the PD and monitoring plan;
- the monitoring plan in the PD is as per the applied methodology.

Our opinion is based on the project's GHG emissions and resulting GHG emission reductions reported, which have been both determined through the valid and registered project's baseline, its monitoring plan and its associated documents.

Pune, 26 November 2018

Eswar Murty

Certification Body "Environment and Energy"
TÜV SÜD South Asia Pvt. Ltd.

Verification period: From 1 March 2015 to 31 March 2018

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2015	0.00	37,882	0.00	37,882
2016	0.00	45,459	0.00	45,459
2017	0.00	45,459	0.00	45,459
2018	0.00	11,365	0.00	11,365
Total	**0.00**	**140,164**	**0.00**	**140,164**

APPENDIX 1: SUMMARY OF REQUESTS AND RESPONSES

CL from this verification

n.a. no CLs identified

CAR from this verification

Table 1.

CAR ID	**CAR 1**	**Section no.**	**3.2 Data and Parameters Monitored**	**Date:** 04 Sept. 2018
Description of CAR				
While assessing the shapefiles of the different plots it could be observed, that there are overlapping of different plots that lead to wrong area values. E.g. S2_4 and S2_2.				
Project participant response				**Date:** 10. Oct. 2018
The project boundaries have been double checked in a GIS system. The mentioned plots where corrected and all other issues have been identified and resolved. The total area has been adjusted accordingly.				
Documentation provided by project participant				
Updated project shape files under drop box Link: https://www.dropbox.com/sh/klfa1gs3r4bub8t/AACx4YFAZKvxZEiZYytFJ9jUa?dl=0				
DOE assessment				**Date:** 02 Nov. 2018
The shapefiles have been corrected, there are no overlappings left. CAR can be closed.				

Table 2.

CAR ID	**CAR 2**	**Section no.**	**3.2 Data and Parameters Monitored**	**Date:** 04 Sept. 2018
Description of CAR				
Within the plots very rare logging/fuelwood collection could be observed, which were represented by the sample plots measured (e.g. M22-3). Nonetheless the trees harvested for fuelwood were partly measured in case they were cutted above 1.3 meters (dbh) and thus are fully counted as carbon volume although the main part of the tree does not exist anymore.				
Project participant response				**Date:** 10. Oct. 2018

The project team and field staff went through the tree inventory database, and checked for all trees with larger diameters (using the Excel function to identify all trees above the 3rd standard deviation of the mean). During the discussion, it was identified that most of the trees with the largest diameter, these trees anyway were identified as pre-existing trees during the inventory. The table of the trees with the largest diameters is resented below:

uid	PLOT_DIV	Strata	plot_uid	species_name	origin	size	height_m	DBH_cm_final
50	M22-3	1	M22-3-W-V2_1811_27	Avicennia Alba	Project	Tree	7.8	20.0
130	M30-1	1	M30-1-S-V2_87_9	Avicennia Officinalis	Pre-Exist	Tree	8.6	19.6
168	4-RM24-1-1	4	4-RM24-1-1-W-V2_2615_39	Avicennia Officinalis	Pre-Exist	Tree	5.2	16.6
132	M30-1	1	M30-1-S-V2_87_9	Avicennia Marina	Pre-Exist	Tree	8.9	16.6
245	ST54-56_1-3	2	ST54-56_1-3-C-V2_2611_27	Soneratia Griffithii	Pre-Exist	Tree	4.5	12.9
117	M30-1	1	M30-1-W-V2_87_9	Avicennia Alba	Pre-Exist	Tree	7.8	12.3
43	M17_2-1	1	M17_2-1-C-V2_177_40	Avicennia Alba	Project	Tree	8	11.9
88	4-ST64-1-1	4	4-ST64-1-1-C-V2_2713_13	Avicennia Officinalis	Project	Tree	5	11.5
119	M30-1	1	M30-1-W-V2_87_9	Avicennia Alba	Pre-Exist	Tree	7.7	11.2
51	M22-3	1	M22-3-W-V2_1811_27	Avicennia Alba	Project	Tree	8	11.1
36	B1-2	1	B1-2-S-F2_1411_30	Soneratia Apetala	Project	Tree	4.3	10.9
62	ST8_1-1	2	ST8_1-1-S-V2_79_21	Avicennia Officinalis	Pre-Exist	Tree	5	10.7
95	M22-7	1	M22-7-E-V2_188_18	Avicennia Alba	Project	Tree	5	10.7
71	B2-1	1	B2-1-W-V2_1514_1	Avicennia Alba	Project	Tree	6.8	10.5
19	B3-1	1	B3-1-C-V2_1512_5	Avicennia Alba	Project	Tree	5	10.5
102	M22-7	1	M22-7-W-V2_188_18	Avicennia Alba	Project	Tree	6	10.5
272	M39_5-1	1	M39_5-1-E-V2_159_42	Avicennia Alba	Project	Tree	6.5	10.5

These trees should have been excluded from the carbon calculations. Therefore, as a revision, the latest ex-post calculation of this monitoring period now excludes all trees marked as pre-existing in the database.

Documentation provided by project participant

See updated Excel spreadsheet '2018-10-08 NEWS_ex-post carbon calculations' under Drop Box link: https://www.drop-box.com/sh/u53igmz7m25sn0g/AADx1InW6RelgoeQTusf_Sj-a?dl=0 ; Tab 'Carbon Calculations' Filter in B7

DOE assessment **Date:** 02.Nov.2018

The data was re-checked by the PPs and those trees that are partly harvested have been deleted. Further pre-existing trees, that shouldn't have been counted for during 1st verification have been deleted as well. Thus, the latest ex-post calculation contains only trees, that have not been harvested respectively that have not been planted by the project activity are accounted for. CAR can be closed.

Table 3.

CAR ID	CAR 3	Section no.	4.2 Project Emissions / Calculation of uncertainty	Date: 04 Sept. 2018
Description of CAR				

In accordance with the monitoring plan, the radius of the of the sample sub point varied between 2 to 3 meters depending, if enough trees could be measured per plot (minimum15). This leads to an incorrect calculation of the total error as the precision level reached is calculated comparing sub sample plots of different size.

Project participant response	**Date:** 10. Oct. 2018

The procedure of limiting the sample on 15 trees has been implemented due to the amount of trees in a young stand such as the mangrove plantings in the Sundarbans. In these types of plantations, the number of trees on a sample plot might be very high. However, including a large number of trees in the estimations does not necessarily improve the calculations or the error estimation. Therefore, the procedure of the 2 different radii of the sample plot circles was implemented (2 or 3 meters, depending on the number of trees). We consulted with forest mensuration professors at the University of Freiburg, and got a response that this procedure is in a way between a fixed size plot procedure, where the size of the sample plots is same, and a distance based plot where the radius of the plot is adjusted for each individual plot. Such procedures are known and used in the praxis of the forest inventory. One example is the k-trees sampling. It is used for example for inventories of young homogenous stands in parts of Germany (ForstBW 2018), or are used as well in different types of community projects (Scheyvens u. a. 2012).

Documentation provided by project participant

ForstBW. 2018. „Aufnahmeanweisung temporäre Betriebsinventur 2018“, 68.

Scheyvens, Henry Dr., Agus Dr. Setyarso, Phung Dr. Van Khoa, und Saykham Boutthavong. 2012. „Participatory Approaches to Forest Carbon Accounting to Mitigate Climage Change, Conserve Biodiversity and Promote Sustainable Development“. Project Report. Asia Pacific Network for Global Change Research. https://www.apn-gcr.org/resources/files/original/1447b99db079c4b95a15bf83aaddd7d9.pdf.

DOE assessment	**Date:** 02.Nov.2018

The variation between different radius depending on whether enough trees could be found in the sample plots is acceptable and good practice in forest inventory.
Nevertheless, the calculation of the precision level reached has to be adopted accordingly.

Project participant response	**Date:** 11. 11. 2018

Our final decision to solve this was to follow the discussed approach to not include all the trees measured which are beyond the horizontal distance of >2 meters. The basically means we assumed that all plots measured had a radius of 2 meters. This way we can maintain the uncertainty calculation as it is. The Excel carbon calculation ‘2018-10-08 NEWS_ex-post carbon calculations’ has been updated accordingly in the drop box folder ‘Response 2’. Please see the comments I inserted in some of the columns including red highlighted cells where I changed the workbook accordingly.

Maintaining the different plot radius of 2 meters and 3 meters was not considered to be solved very easily since this would have meant to perform a spatial analysis to identify the areas of the additional strata required (for instance stratum 1 had to be further stratified into stratum 1-2m and stratum 1-3m)

Documentation provided by project participant

See Excel carbon calculation ‘2018-10-08 NEWS_ex-post carbon calculations’ in the drop box folder ‘Response 2’
Link: https://www.dropbox.com/sh/c2ijeggu06x2372/AADiPeC5HdEOjSsQPaQLyxxAa?dl=0

DOE assessment	**Date:** 19.11. 2018

The calculations of the total volume/carbon calculations respectively the precision level was adapted accordingly by leaving out all those trees that would have been in the outer area of the sample plot (between 3 to 2 m). CAR can be closed.

FAR from this verification

Table 4.

FAR ID	FAR 1	**Section no.**	**2.1 Implementation Status of the Project Activity**	**Date:** 04 Sept. 2018
Description of FAR				
During the onsite visit it could be observed, that the measurement of the height was done along the tree trunk, which leads to the measurement of the length, but not the height of the tree. The height measurement is not of importance for the calculation of the stem volume as the allometric equation applied is using the dhb only. Nevertheless, if the height measurements shall be used in the future for other types of assessments, it would be advisable to measure the real height and not the length as the height is normally used for different types of calculations und assessments in forest science.				
Project participant response				**Date:** 10. Oct. 2018
As a response to this request, the project will specifically focus on correct height measurements during the next round f refresher inventory training which is an integral part of the standardized Livelihoods project verification cycle (usually every 3 years)				
DOE assessment				**Date:** 02.Nov.2018
Should be assessed during next verification.				

APPENDIX 2: INFORMATION REFERENCE LIST

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or submission date
01	Tüv Süd	List of Participants/Interviewed Persons: Ajanta Dey – Project coordinator Sourav Bera – Carbon Monitoring coordinator Keshab Ghosh – Field officer in charge Biswajit Mondal – Field officer / Bidya Zone Chandan Maity – Field officer / Saptamukhani Zone Paritosh Giri – Field officer / Surveillance Muktaram Sardar – Chairman / BFPCL (Badabon Farmers Producer Company Limited)	29 Jul – 3 Aug 2018

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or sub-mission date
		Gopinath Halder — Field supervisor / Matla Sukdev Sarbar — Field supervisor / Matla Bhagabat Sasivcal — Mangrove Steward Pran Krishna Jana — Mangrove Steward Prabir Mondal — Field Supervisor / Sagar Tapan Dinda — Mangrove Steward Metodi Panev — Consultant Unique Forestry and Land use Sharaf Ali Khan — Mangrove Steward Haradhan Roy — Mangrove Steward	
02	NEWS & UNIQUE forestry and land use	VCS Monitoring Report: India Sundarbans Mangrove Restoration; Version 2.0	11 Nov 2018
03	NEWS & UNIQUE forestry and land use	VCS Project Description: India Sundarbans Mangrove Restoration; Version 5.0	10 Jun 2015
04	NEWS & UNIQUE forestry and land use	Non-Permancence-Risk Report: India Sundarbans Mangrove Restoration; Version 2.0	11 Nov 2018
05	NEWS & UNIQUE forestry and land use	VCS-NEWS Risk-Report-Calculation-Tool-v3.1-1	11 Nov 2018
06	NEWS & UNIQUE forestry and land use	2018-10-08 NEWS_ex-post carbon calculations	11 Nov 2018
07	NEWS & UNIQUE forestry and land use	2015-04-18 TARAM Ex-Ante S4_update_baseline	11 Nov 2018
08	NEWS & UNIQUE forestry and land use	GIS-shape files: • Grouped Project Boundary • Project_Boundary • Strata	11 Nov 2018
09	NEWS & UNIQUE forestry and land use	Inventory SOP: 2018-02-23 NEWS_2nd Verification Inventory Sampling Monitoring Plan	23 Feb 2018
11	Livelihoods	Minutes of the Board of Directors Metting	18 Dec 2014
13	NEWS	QA/QC Protocol	29 Jul 2018
14	SCS	Verification Report: India Sundarbans Mangrove Restoration; Version 1.0	8 Sep 2015

Ref. No.	Author/Editor/ Issuer	Title/Type of Document. Publication place	Issuance and/or sub-mission date
15	Tüv Süd / NEWS	• Tree_Final-Verification (data of remeasurement) • Field Sheets	29 Jul – 3 Aug 2018
16	Tüv Süd	GPS tracks & waypoints	29 Jul – 3 Aug 2018
17	Tüv Süd	Statistics Verification: India Sundarbans Mangrove Restoration	03 Oct 2018
18	NEWS	Example of monitorings: • Mangrove Steward monthly Report • Mangrove Surveillance, endangered fauna and flora survey • Village meetings • Survey of fisherman	29 Jul 2018
19	Livelihoods	Proof: Cash Flow Break Even	13 Mar 2015
20	World Bank	Building Resilience for Sustainable Development of the Sundarbans; Strategy Report	2014