



Monitoring report form for CDM project activity
(Version 08.0)

MONITORING REPORT

Title of the project activity	13 MW Grid Connected Dandela Mini Hydel Scheme, Karnataka State, India		
UNFCCC reference number of the project activity	3568		
Version number of the PDD applicable to this monitoring report	02		
Version number of this monitoring report	01		
Completion date of this monitoring report	10/05/2021		
Monitoring period number	03		
Duration of this monitoring period	01/01/2013 to 03/09/2020		
Monitoring report number for this monitoring period	Not Applicable		
Project participants	M/s Sagar Power (Dandela) Private Limited		
Host Party	India		
Applied methodologies and standardized baselines	AMS-I.D. ver.13 - Grid connected renewable electricity generation Standardized baselines – Not Applicable		
Sectoral scopes	1 : Energy industries (renewable - / non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	0 tCO _{2e}	96,086 tCO _{2e}	0 tCO _{2e}
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	246,971 tCO ₂		

SECTION A. Description of project activity

A.1. General description of project activity

The project activity is a hydro project of capacity 13.05 MW constructed on Netravathi river at Dandela falls in Dakshina Kannada District of Karnataka, India. The main purpose of the project activity is generation of electricity using hydro potential available in the river and exporting the generated power to Karnataka Power Transmission Corporation Limited (KPTCL) a state owned power utility company.

The essential components of this power project consist of a Power House with an installed capacity of 13.05 MW, Diversion structure across the river, , Forebay, Penstock connected with forebay and power house, Intake structure with gates and trash rack, Tail Race Pool and Tail Channel. The power from the project activity will be evacuated through 11/33 kV Beltangady Sub-station. In this process there are no greenhouse gas emissions or burning of any fossil fuels. Thus electricity is generated through sustainable means without causing any negative effect on the environment.

The project activity has been commissioned on 19/07/2009 and registered with CDM-EB on 04/09/2010. The present monitoring period is chosen from 01/01/2013 to 03/09/2020. The net electricity supplied to the State grid by the project activity is 112.42 GWh and the net emission reductions are 96,086 tCO₂e for the present monitoring period.

A.2. Location of project activity

Host Party: India

District/State: Dakshina Kannada District, Karnataka State.

Village/Taluk: Dandela village, Beltangady Taluk

Geographical coordinates: 12°57' 17" N and Longitude 75°21' 44" E



Map 1: Location of Karnataka in India



Map 2: Location of Dakshina kannada district in Karnataka

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India	Sagar Power (Dandela) Private Limited	No

A.4. References to applied methodologies and standardized baselines

Applied Baseline methodology:

Title: AMS-I.D. Grid connected renewable electricity generation (Version 13.0, EB 36, Annex 26)¹

The tools associated with the methodology are:

Tool to calculate the emission factor for an electricity system, Version 01 (EB 35, Annex 12)²

Tool for the demonstration and assessment of additionality, Version 05.2 (EB 39, Annex 10)³

A.5. Crediting period type and duration

Crediting Period Type: Fixed

Start Date: 04/09/2010

Length of crediting period: 10 Years

Duration of Crediting Period: 04/09/2010 to 03/09/2020 (10 years)

SECTION B. Implementation of project activity**B.1. Description of implemented project activity**

The project activity has been commissioned on 19/07/2009 and registered with CDM EB on 04/09/2010. The project promoter has installed all monitoring equipment's to monitor the parameters.

The project activity utilises potential energy available in flowing water for power generation. The process involves converting the kinetic energy available in the water flow into mechanical energy using hydro turbines and then to electrical energy using alternators. The generated electricity is transformed to match the nearest grid substation for proper interconnection and smooth evacuation of power. The details of major equipment of the project activity are furnished below:

Equipment Specifications*Turbine*

Make : Boving Fouress Ltd

Type : Horizontal Full Kaplan

Rated discharge : 34.365 Cumecs

Speed : 255 RPM

Quantity : 3

Generator

Make : Toyo Denki Power systems

¹ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

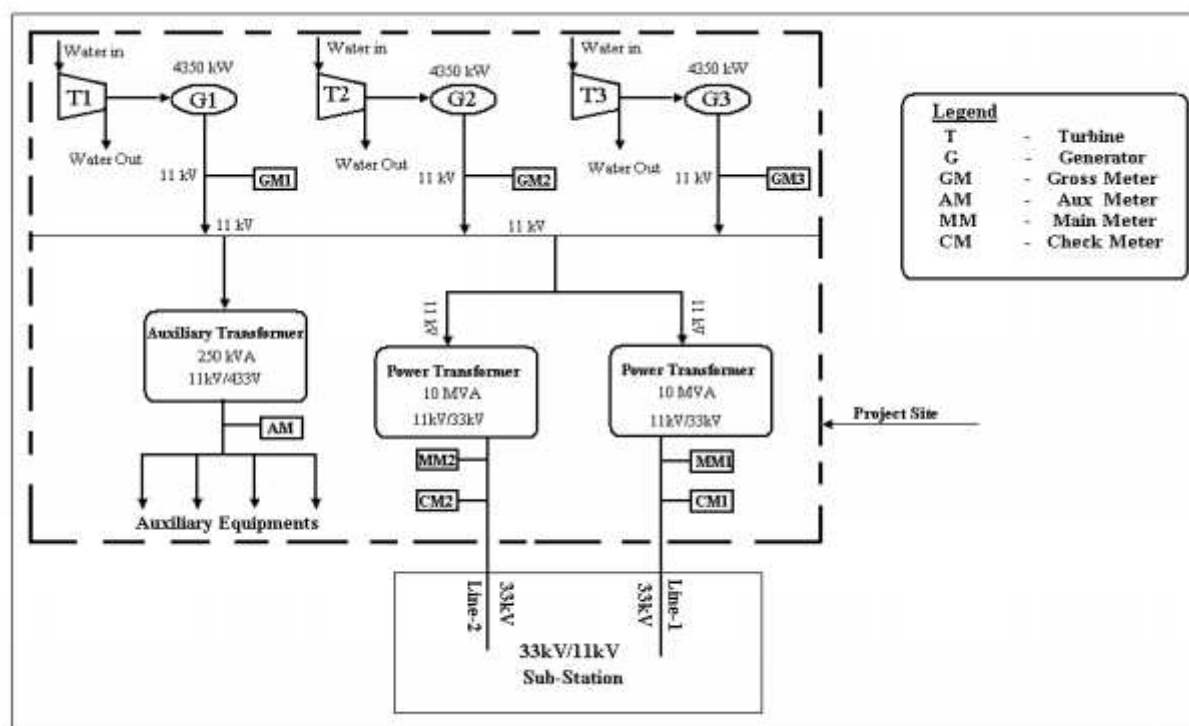
² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.pdf>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf>

Capacity : 4.35 MW
 Power factor : 0.8
 Voltage : 11 kV
 Rated speed : 750 RPM
 Frequency : 50 Hz

Quantity : 3

No significant issues or situations that have occurred during the monitored period, which may impact the applicability of the methodology and calculations of GHG emission reductions.



B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

There are no temporary deviations from the registered monitoring plan or applied methodology.

B.2.2. Corrections

There were no corrections to project information or parameters fixed at the registration or renewal of crediting period of the project activity

B.2.3. Changes to the start date of the crediting period

No. There has been no change in the start date of the monitoring period.

B.2.4. Inclusion of monitoring plan

There has been no change in the monitoring plan

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

The monitoring plan of the project activity has been revised and the same has been approved by Executive Board on 24/01/2012. The details are available at the UNFCCC web site.

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1269843478.58/view>

B.2.6. Changes to project design

The following changes are observed in the project design as against the values mentioned in the registered CDM-PDD.

Parameter	As per registered PDD	Actual
Plant capacity	13 MW	13.05 MW
Design flow	105 m ³ /sec	104.55 m ³ /sec

These changes were notified to CDM Executive board and the same is approved by Executive Board on 24/01/2012. The details are available at the UNFCCC web site.

<http://cdm.unfccc.int/Projects/DB/DNV-CUK1269843478.58/view>

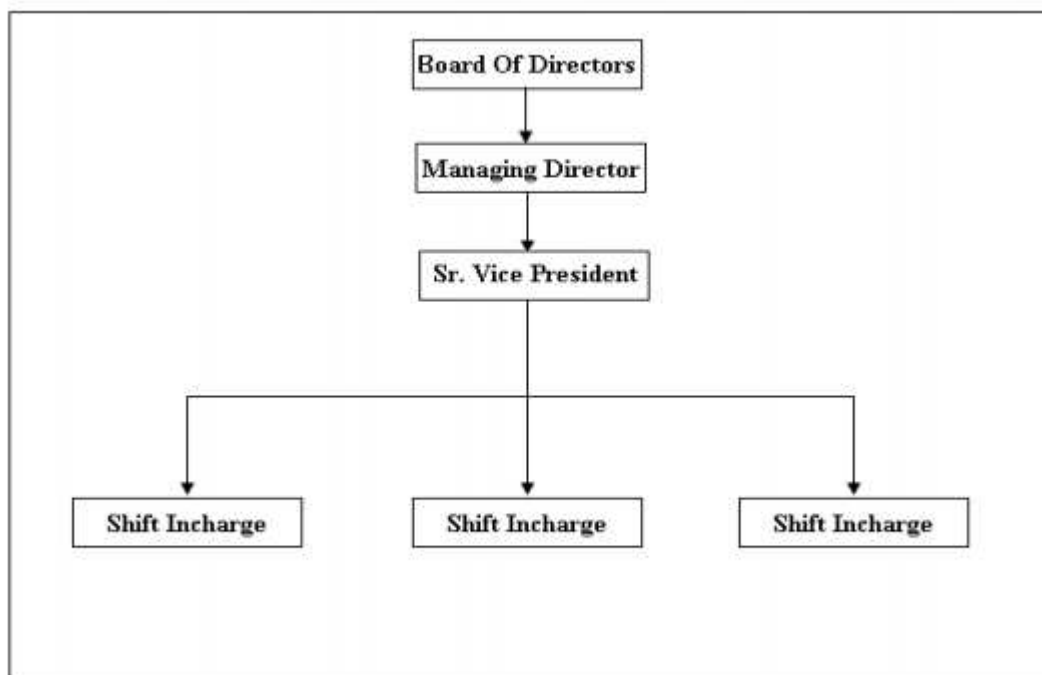
B.2.7. Changes specific to afforestation or reforestation project activity

Not applicable as this is not an afforestation or reforestation project activity.

SECTION C. Description of monitoring system

CDM Monitoring Team

A CDM team has been formed in Sagar Power (Dandela) Private Limited (SPPL) for monitoring and verification of all the monitoring parameters as per the guidelines formulated by the management of SPPL. Qualified and trained people monitor the parameters and emission reduction calculations. SPPL is the sole agency responsible for implementation and monitoring of the project activity. The monitoring organisation structure is shown below



Roles and Responsibilities

Board of Directors

The authority and responsibility for monitoring, measuring, reporting and reviewing of the data rests with the Board of Directors. The Board have delegated the same to Managing Director.

Managing Director

Managing Director is responsible for the total monitoring plan. MD will examine the GHG monitoring activities and reports generated by Sr. Vice President w.r.t the monthly electricity generated, exported and annual emission reductions as per the monitoring plan. He also examines the internal audit reports prepared by Sr. Vice President and will in particular take note of any deviations in data over the norms and monitor that the corrective actions have resulted in adherence to standards.

Sr.Vice President

The Sr. Vice President is the person who is responsible for GHG monitoring activities in the project activity. He has appointed experienced persons (mechanical and electrical) in various disciplines to assist him. He is responsible for review the monthly reports submitted by Shift Incharge and prepare a report on operational conditions of plant and also compiling the data on electricity export to the grid system for submission to the Managing Director.

The responsibility of storage and archiving of information in good condition also lies with the Sr.Vice President. He will undertake periodic verifications and onsite inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions. The Sr. Vice President will review the data collected by the team and suggest corrective actions wherever required. An internal audit report will be prepared for review by the Managing Director and Board of Directors which will be later submitted for verification by an independent entity (DOE).

Shift In-charge

Shift In-charge is responsible for recording the total electricity generation, auxiliary consumption, electricity export, import, plant shut down times, etc. The monthly reports will be generated and submitted to the Sr.Vice President for verification and emission reduction calculations.

QA & QC Procedures

The project activity will install good quality, high accuracy monitoring and control equipments that will measure, record and control of various key parameters of the plants. These monitoring and controls will be the part of the Control Systems of hydroelectric plant. The Gross and Auxiliary meters installed at project site will be accuracy of 0.5 class and these meters are calibrated as per industry standards but at least once in three years.

The main and check meters will be electronic tri-vector of accuracy class 0.2% and tested for accuracy every calendar quarter. The main and check meters will be deemed to be working satisfactorily if the errors are within specifications for meters of 0.2% accuracy class.

If during the quarterly tests, the main meter is found to be within the permissible limit of error and the corresponding check meter is beyond the permissible limits, then billing will be as per the main meter as usual. The check meter however, will be calibrated immediately.

If the main meter is found to be beyond permissible limits of error, but the corresponding check meter is found to be within permissible limits of error, then the billing for the month upto the date and time of such test will be as per the check meter. The main meter will be calibrated immediately and billing for the period thereafter till the next monthly meter reading will be as per the calibrated main meter.

If during any of the monthly meter readings, the variation between the main meter and the check meter is more than that permissible for meters of 0.2% accuracy class, all the meters will be re-tested and calibrated immediately.

Records of calibration certificates will be maintained for verification. Hence, high quality is ensured with the above parameters. Sales records will be used and kept for checking the consistency of the recorded data.

Methods of data transfer and archiving policy

The data will be recorded by plant personnel at the project site and also the monthly export & import readings will be recoded & certified by Govt. officials. The electricity generation and distribution structure will be measured using calibrated meters. Records of measurements will be used for verification of emissions reductions. Sales bills / receipts may be compared as an alternative proof of the electricity exported to the grid.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF _y
Unit	tCO ₂ /GWh
Description	CO ₂ emission factor for the regional grid system
Source of data	CEA Published grid emission factor
Value(s) applied	854.7 (2006-07)-Ex ante approach
Choice of data or measurement methods and procedures	Central Electricity Authority (CEA) values have been used for authenticity of the data, available publicly by Govt of India with a view to obtain uniformity of approach in the country towards a common objective

Purpose of data/parameter	To calculate baseline emissions
Additional comments	--

Data/Parameter	COEF _i
Unit	kgCO ₂ /mass
Description	Kg CO ₂ emission factor of fuel type i
Source of data	IPCC 2006 default values
Value(s) applied	Diesel : 3.1863
Choice of data or measurement methods and procedures	IPCC values have been used for diesel since no country specific data is available
Purpose of data/parameter	To calculate baseline emissions
Additional comments	The project activity may combust only one type of fossil fuel i.e. diesel during the project operation to meet the emergency power requirement of the project. Hence only emission factor of diesel is provided in the parameter

D.2. Data and parameters monitored

Data/Parameter	EG_{Gross,y}
Unit	GWh
Description	Total electricity generated by the project activity during the year y
Measured/calculated/default	Measured
Source of data	Daily generation log book maintained at project site
Value(s) of monitored parameter	116.072
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Continuous monitoring and daily recording
Calculation method (if applicable)	Not applicable
QA/QC procedures	The Meters used for measuring the Gross electricity generation will be calibrated by third party as per national standards but at least once in three years as per SSC-CDM guidelines, Version 17. The installed meters will have accuracy of 0.5 class..
Purpose of data/parameter	--
Additional comments	--

Data/Parameter	EG_{Auxiliary,y}
Unit	GWh
Description	Auxiliary electricity consumption of the project
Measured/calculated/default	Measured
Source of data	Daily generation log book maintained at project site.
Value(s) of monitored parameter	2.433
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Continuous monitoring and daily recording

Calculation method (if applicable)	Not applicable
QA/QC procedures	Meters are recalibrated periodically at reputed third party lab
Purpose of data/parameter	--
Additional comments	--

Data/Parameter	EG _{export,y}					
Unit	GWh					
Description	Net electricity supplied to the grid by the project					
Measured/calculated/default	Measured					
Source of data	Monthly Joint Meter Reading Reports certified jointly by representative of KPTCL, MESCOM and SPPL					
Value(s) of monitored parameter	113.638					
Monitoring equipment	Energy Meters					
	Line 1					
		Main Meter		Check Meter		
	Serial No.	11069591		11069286		
	Type	ABT featured Tri vector		ABT featured Tri vector		
	Make	L & T		L & T		
	Accuracy class	0.2s		0.2s		
	Calibration frequency	Once in a year		Once in a year		
	Last calibration date	10/09/2012	09/09/2013	10/09/2012	09/09/2013	
		03/09/2013	02/09/2014	03/09/2013	02/09/2014	
	Line 2					
		Main Meter		Check Meter		
	Serial No.	11069593		11069594		
	Type	ABT featured Tri vector		ABT featured Tri vector		
	Make	L & T		L & T		
	Accuracy class	0.2s		0.2s		
	Calibration frequency	Once in a year		Once in a year		
	Last calibration date	10/09/2012	09/09/2013	10/09/2012	09/09/2013	
		03/09/2013	02/09/2014	03/09/2013	02/09/2014	
	Considering the calibration dates, it can be concluded that calibration has been done in accordance with QA/QC procedures.					
	Measuring/reading/recording frequency	Continuous monitoring and monthly recording				
	Calculation method (if applicable)	Not applicable				
	QA/QC procedures	Meters will be calibrated as per valid PPA. Sales records to the grid and other records are used to ensure consistency.				
	Purpose of data/parameter	To calculate baseline emissions				
	Additional comments	--				

Data/Parameter	EG_{import,y}																								
Unit	GWh																								
Description	Grid electricity import to the project activity during the year y																								
Measured/calculated/default	Measured																								
Source of data	Monthly Joint Meter Reading Reports certified jointly by representative of KPTCL, MESCOM and SPPL																								
Value(s) of monitored parameter	1.2169																								
Monitoring equipment	Energy Meters Line 1																								
	<table border="1"> <tr> <td></td><td>Main Meter</td><td>Check Meter</td></tr> <tr> <td>Serial No.</td><td>11069591</td><td>11069286</td></tr> <tr> <td>Type</td><td>ABT featured Tri vector</td><td>ABT featured Tri vector</td></tr> <tr> <td>Make</td><td>L & T</td><td>L & T</td></tr> <tr> <td>Accuracy class</td><td>0.2s</td><td>0.2s</td></tr> <tr> <td>Calibration frequency</td><td>Once in a year</td><td>Once in a year</td></tr> <tr> <td>Last calibration date</td><td>10/09/2012</td><td>09/09/2013</td></tr> <tr> <td></td><td>03/09/2013</td><td>02/09/2014</td></tr> </table>		Main Meter	Check Meter	Serial No.	11069591	11069286	Type	ABT featured Tri vector	ABT featured Tri vector	Make	L & T	L & T	Accuracy class	0.2s	0.2s	Calibration frequency	Once in a year	Once in a year	Last calibration date	10/09/2012	09/09/2013		03/09/2013	02/09/2014
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		03/09/2013	02/09/2014																						
	Line 2																								
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		Main Meter	Check Meter																						
	Serial No.	11069593	11069594																						
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	Make	L & T	L & T																						
	Accuracy class	0.2s	0.2s																						
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	Last calibration date	10/09/2012	09/09/2013																						
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	Measuring/reading/recording frequency	Continuous monitoring and monthly recording																							
	Calculation method (if applicable)	Not applicable																							
	QA/QC procedures	Meters will be calibrated as per valid PPA. Sales records to the grid and other records are used to ensure consistency.																							
	Purpose of data/parameter	To calculate baseline emissions																							
Additional comments	--																								

Data/Parameter	EG_y
Unit	GWh
Description	Net Electricity supplied (to grid) by the project activity during the year y

Measured/calculated/default	Calculated
Source of data	Not applicable
Value(s) of monitored parameter	112.421
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Continuous monitoring and monthly recording
Calculation method (if applicable)	Calculated as the difference of "EG _{export,y} " and "EG _{import,y} " i.e. $EG_y = EG_{export,y} - EG_{import,y}$
QA/QC procedures	The parameter will be cross checked with the records of sales
Purpose of data/parameter	To calculate baseline emissions
Additional comments	--

Data/Parameter	F_{i,y}
Unit	Tonners/ kilo letres
Description	Quantity of fossil fuel type i combusted in the project plant during year y
Measured/calculated/default	Measured
Source of data	Log books of DG set maintained at project site
Value(s) of monitored parameter	0
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Recorded daily and aggregated monthly
Calculation method (if applicable)	Not applicable
QA/QC procedures	Not applicable
Purpose of data/parameter	To calculate project emissions
Additional comments	--

D.3. Implementation of sampling plan

No sampling plan is required for this project activity

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

The baseline emissions are calculated as follows:

Baseline emissions from the project activity (tCO₂) = Baseline emission factor (tCO₂/MWh) X Net export from the project activity (MWh)

Baseline emission factor = 0.8547 tCO₂/GWh (i.e. 854.7 tCO₂/GWh)

Net export from the project activity = 112,421.82 MWh (i.e. 112.421 GWh)

Baseline emissions from the project activity (tCO₂) = 112,421.82 * 0.8547 = 96,086 tCO₂ (Round-down value)

Baseline emissions from the project activity = 96,086 tCO₂e

E.2. Calculation of project emissions or actual net removals

Since, no diesel was used during the reported period, so no project emissions are considered for this period.

Project Emissions (PE_y) = 0 tCO₂

Project Emissions (PE_y) = 0 tCO_{2e}

E.3. Calculation of leakage emissions

As per sec. 12 of AMS ID, the energy generating equipment is not transferred from another activity or the existing equipment is transferred to another activity. Hence the leakage emissions are considered zero.

Hence Leakage Emissions (LE_y) = 0 tCO_{2e}

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO _{2e})	Project GHG emissions or actual net GHG removals (t CO _{2e})	Leakage GHG emissions (t CO _{2e})	GHG emission reductions or net anthropogenic GHG removals (t CO _{2e})			
				Before 01/01/2013	From 01/01/2013 until 31/12/2020	From 01/01/2021	Total amount
Total	96,086	0	0	0	96,086	0	96,086

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO _{2e})	Amount estimated ex ante for this monitoring period in the PDD (t CO _{2e})
96,086	246,971

E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”

The explanation regarding calculation of estimated ex ante for this monitoring period is mentioned below:

Start date of the monitoring Period	01-01-2013
End date of monitoring period	03-09-2020
Number of days in monitoring period	2,803
Annual estimated reductions as per the PDD	32,160
Estimated emission reductions for this monitoring period	246,971
Actual emission reductions for this monitoring period	96,086

E.6. Remarks on increase in achieved emission reductions

Not applicable as the achieved emission reductions during this monitoring period are about 61% lower than the estimated emission reductions during this monitoring period. The variation is mainly

attributed to fact of rainfall pattern, water availability etc., which are beyond the control of project participant.

E.7. Remarks on scale of small-scale project activity

The project activity remains small-scale throughout the monitoring period.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
08.0	6 April 2021	Revision to: <ul style="list-style-type: none"> • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		