




**Verification and certification report form for
CDM programme of activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	PoA for Promotion of the Improved Water Mills (IWM) in Nepal (UNFCCC no:9889)	
Version number(s) of the PoA-DD(s) to which this report applies	10.0	
Version number of the verification and certification report	2.0	
Completion date of the verification and certification report	05/11/2019	
Monitoring period number and duration of this monitoring period	Monitoring period number: 02 01/01/2018 to 31/12/2018	
Number and version number of the monitoring report to which this report applies	Number is 1 of 1. Version is 3.0	
Coordinating/managing entity (CME)	Alternative Energy Promotion Centre (AEPC)	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Nepal	Yes
Applied methodologies and standardized baselines	AMS-I.B. ver. 12 - Mechanical energy for the user with or without electrical energy	
Mandatory sectoral scopes	Energy industries (renewable/non-renewable sources)	
Conditional sectoral scopes, if applicable	NA	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	CPA-1: 11,022 tCO ₂ e CPA-2: 11,273 tCO ₂ e Total: 22,295 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	CPA-1: 7190 tCO ₂ e CPA-2: 3,564 tCO ₂ e Total: 10,754 tCO ₂ e	
Name and UNFCCC reference number of the DOE	EPIC Sustainability Services Private Limited (E-0062)	
Name, position and signature of the approver of the verification and certification report	 K.Suryanarayana Murthy, Managing Director	

SECTION A. Executive summary

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EPIC Sustainability Services Private Limited (EPIC) has been contracted by Alternative Energy Promotion Centre (AEPC) to undertake the second periodic independent verification of the registered CDM programme of activity titled "PoA for Promotion of the Improved Water Mills (IWM) in Nepal" (UNFCCC reference number: 9889). The objectives of this verification are to verify and certify emission reductions reported for project activity for the monitoring period of 01/01/2018 to 31/12/2018 (first and last day included); and to verify that the data reported are complete and transparent.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria for CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol, the CDM rules and modalities as agreed in the Bonn Agreement, the Marrakech Accords and the CDM Executive Board's decisions.

The verification team has, based on the recommendations in the Validation and Verification Standard for Programme of activities, Version 2.0^{/1/}, employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generations of CERs. The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

The scope of the verification is the independent and objective review and ex-post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the registered project design document (PoA-DD)^{/2/}, version 8.0 dated 03/08/2015 and validated and approved project design document (PoA-DD)^{/3/} version 10.0 dated 22/04/2019, corresponding validation reports^{/4/}, registered CPA-DD's (CPA 1 to CPA 2)^{/5/}, validated and approved CPA-DD's^{/6/} (CPA 1 version 10.0, dated 22/04/2019 and CPA 2, version 4.0, dated 22/04/2019) and corresponding validation reports^{/7/}. These documents were reviewed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance. The PoA involves the Promotion of the Improved Water Mills (IWM) in Nepal. The main objective of the IWM Project of AEPC in Nepal is to promote dissemination of IWM replacing existing low powered, less efficient Traditional Water Mills (TWMs) to the existing owners or new installers (potential diesel mill owners) in Nepal and to avoid possible switchover/installation to diesel based mills by new installer (potential diesel mill owners) to meet high powered milling requirements. The IWMs with increased efficiency and cost effective services to the users will help avoid installation of diesel based mills in the hilly areas. The IWM is a modified version of the TWM which translates into a higher processing capacity and possibility of providing a diverse range of services like hulling, oil expelling, saw milling, etc. Thus IWM increase energy output helping both hullers and millers.

Under IWM Programme, standard low capacity TWMs of capacity 0.35 kW are replaced by energy efficient IWMs (short shaft and long shaft) of installed capacity ranging from 1.39 kW (minimum value, more than 97% of Short Shaft IWMs will be above this value) to 2.83 kW (on minimum value, more than 97% of Long Shaft IWMs will be above this value) SSC-CPAs include installation of high capacity IWMs replacing traditional low powered, less efficient water mills which avoid installation of diesel mills to meet increasing high power requirements. The proposed IWM does the same job of the TWM by improving the flat paddled wooden runner. The increased power output result in faster milling and shorter waiting times for users. The metallic shaft and pulley for power take off allow the usage of a range of other appliances including electrification in addition to traditional grinding. In case of long shaft IWMs electrical energy could also be generated as one of the end uses; however, the electricity and mechanical energy are not generated simultaneously. Normally, mechanical energy is used during the day time for agro-processing and electricity is generated during evening for lighting. The turbine that generates mechanical and electrical energy is the same. Though there is possibility for the generation of electrical energy, only mechanical energy generated by IWMs is counted towards emission reductions. This verification covers CPA-1 and CPA2

With financial assistance from Government of Nepal (GoN) and donor agencies, Regional Service Centres (RSCs) are assisting AEPC as a service centre to implement the IWM Programme AEPC is a public entity that executes all renewable/alternative energy programmes in Nepal including this POA.

The verification team determines the conformity of the actual project activity and its operation with the registered and approved PoA-DD and CPA-DDs. The verification team has, by means of a desk review and an on-site visit, assessed that all physical features of the proposed CDM programme of activity are in place, and that the project participants have operated the CDM project activity as per the PoA-DD and the CPA-DD. Thus the verification team has concluded that the project activity was implemented and operated as per PoA-

DD, and that all physical features of the project are in place and comply with VVS-PoA. The start date of this monitoring period is 01/01/2018.

The monitoring report^{/8/} is in compliance with the monitoring plan of the PoA-DD/CPA-DDs. The project activity was registered by applying the small scale methodology AMS.I.B^{/9/} version 12.0 and the verification was carried out in accordance with the applied methodology. It was confirmed during the site visit that the project activity during the current periodic verification is in accordance with the applicability criteria of the methodology.

It is the responsibility of EPIC to express an independent GHG verification opinion on the GHG emissions reductions and on the calculation of GHG emission reductions from the project for this monitoring period based on the reported emission reduction in the monitoring Report.

EPIC's verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive board. EPIC's approach was risk-based, drawing on an understanding of the risks associated with reported GHG emissions data and the controls in place to mitigate these. The examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for this monitoring period.

The verification team has planned and performed the work to obtain the information and explanations that is considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	IR	D	Siddaramu	EPIC, Central office, Bangalore	√	√	√	√
2.	Host Country Expert	ER	Narendra	Ghimire	EPIC, Central office, Bangalore	√	√	√	√

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	R	Vijayaraghavan	EPIC, Central office, Bangalore
2.	Approver	IR	Murthy	K.Suryanarayana	EPIC, Central office, Bangalore

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Errors in manual transfer of records.	Low	Likely human error during transfer of data to ER spread sheets and MR	Complete review of data transfer to the ER spread sheet and in the MR.
2.	Wrong data collection / misinterpretation of IWM installation	Low	Monitoring process is not complicated. Pre- requisite trainings are conducted for the monitoring personnel.	By means of site visit check of actual situation to sample number of IWMs.

C.2. Consideration of materiality in conducting the verification

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In line with Guidelines for Application of materiality in verification^{/10/}, a reasonable level of assurance is defined for the verification of the project by complete verification of all the values indicated in the emission reduction spread sheet and the referred documents, at the document review stage and onsite visit. There are no material errors, omissions or misstatements. The identified/selected materiality threshold for the PoA under current monitoring period is 5% as PoA is small scale in accordance with VVS for PoA, Version 2.0.

SECTION D. Means of verification

D.1. Desk/document review

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The verification was performed primarily based on the review of the monitoring report, validated and approved PoA-DD, CPA-DDs, its corresponding validation reports and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, and the QA/QC procedures, and an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of emission reduction. The monitoring report version 01 (hereinafter referred to as initial MR) submitted by the project participant and additional background documents related to the emission reductions are reviewed as an initial step of the verification process. The subsequent step involved the identification of corrective action requests and clarification requests (CAR and CL) which are presented in Appendix 4 of this report. As a result of these findings, the MR is revised to MR version 03^{/11/}. A complete list of all documents and records reviewed is as attached in Appendix 3 of this report.

D.2. On-site inspection

Duration of on-site inspection: 14/10/2019 to 19/10/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	<p>The project site to confirm the information and to resolve issues identified in the document review. An on-site assessment was conducted as a part of verification activity and involved:</p> <ol style="list-style-type: none"> 1. an assessment of the implementation and operation of the CDM programme of activity as per the PoA-DD/CPADD's 2. a review of information flows for generating, aggregating and reporting of the monitoring parameters 3. interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan 4. a cross-check between information provided in the MR and data from other sources 5. a check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the PoA-DD and the applied methodology 6. a review of calculations and assumptions made in determining the GHG data and ERs, and 7. an identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters 	IWMs	14/10/2019 to 19/10/2019	Dr.D.Siddaramu and Mr. Narendra Ghimire

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Pokhrel	Prem Kumar	Climate and Carbon Expert, AEPC	14/10/2019 to 19/10/2019	Project activity, ER calculations, Sampling, Monitoring, QA/QC procedures, Documentation, Record keeping, Customer complaints	Dr.D.Siddaramu and Mr. Narendra Ghimire
2.	Acharya	Rajan	Sub-Er, APEC			
3.	Bhadhur	Dhruba	Chairperson,		IWMs operation & its type, operating hours, O&M, Non-working hours (if any, and reasons), water availability, Customer complaints, etc	
4.	Rona	Bal Krishna	IWM Owner and Installer, Dolakha			
5.	Kandla	Ratna Prasad	Chairperson,			
6.	23 Households in localities of Dolakha, Kavre and Ramechhap districts of Nepal			14/10/2019 to 19/10/2019	IWMs operation & its type, operating hours, O&M, Non-working hours (if any, and reasons), water availability, etc	

D.4. Sampling approach

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The verification team used acceptance sampling approach for checking the operational status of the IWMs. A sample size of 22 was required, based on an AQL of 0.5% and UQL of 15%, the producer risk used is 5% and consumer risk used was 15%. In accordance with the para table on page no.11 of "Sampling and surveys for CDM project activities and programmes of activities", version 07.0

However, the verification team visited 26 households (23 sampled households and 03 non-sampled households) in localities of Dolakha, Kavre and Ramechhap districts of Nepal. It was observed that all the IWMs were working in good condition and no discrepant records were observed with the published MR and survey sample records. Thus PP's set of records has been accepted.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verifications	-	-	FAR01
CPAs considered for verification and covered in this report	-	-	-
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents ¹	-	-	-
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Component project activities			
Compliance of the CPA implementation with the included CPA design document	-	-	-
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
<ul style="list-style-type: none"> Data and parameters fixed ex ante or at renewal of crediting period 	-	-	-
<ul style="list-style-type: none"> Data and parameters monitored 	-	-	-
<ul style="list-style-type: none"> Implementation of sampling plan 	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
<ul style="list-style-type: none"> Calculation of baseline GHG emissions or baseline net GHG removals by sinks 	-	-	-
<ul style="list-style-type: none"> Calculation of project GHG emissions or actual net GHG removals by sinks 	-	-	-
<ul style="list-style-type: none"> Calculation of leakage GHG emissions 	-	-	-
<ul style="list-style-type: none"> Summary of calculation of GHG emission reductions or net GHG removals by sinks 	-	-	-
<ul style="list-style-type: none"> Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA 	-	-	-
<ul style="list-style-type: none"> Remarks on difference from estimated value in included CPA 	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Usage survey	CL03	-	-
Double counting	CL04	-	-
Usage survey questionnaires	CL01 and CL05	-	-
Documents/Training records	-	CAR01 and CAR02	-
Total	05	02	01

SECTION E. Verification findings

E.1. General

E.1.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The verification team has determined whether the monitoring report was completed using the valid version of the applicable monitoring report form i.e., Monitoring report form for CDM programme of activities. The verification team has checked whether all the sections of the monitoring report follows the guidelines provided in the template itself.
Findings	There is no CAR/CL raised in this section.
Conclusion	The verification team has concluded that the monitoring report was completed using the valid version (i.e., CDM-PoA-MR-FORM, version 03) ^{12/} of the applicable monitoring report form and is followed the guidelines given in the template itself.

E.1.2. Remaining forward action requests from validation and/or previous verifications

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The verification team has reviewed the validation and previous verification reports and observed that there was 01 FAR carried forward to the current verification i.e., 02nd verification for resolution. EPIC has not raised any forward Action Request (FAR) during this verification process to be resolved in next.

E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
PoA for Promotion of the Improved Water Mills (IWM) in Nepal (9889-P1-0001-CP1)	Yes	09 Sep 2015	10.0	Yes (this is the 2 nd monitoring period)
PoA for Promotion of the Improved Water Mills (IWM) in Nepal (9889-P1-0002-CP1)	Yes	01 Feb 2017	10.0	Yes (this is the 2 nd monitoring period)

E.2. Programme of activities**E.2.1. Compliance of the programme implementation with the registered programme design document**

Means of verification	The verification team determined the conformity of the actual project activity and its operation with the registered project design document. EPIC has, by means of a desk review and an onsite visit, assessed that all physical features of the proposed CDM project activity proposed in the PoA-DD and CPA-DDs are in place, and that the PP/CME has operated the CDM project activity as per the registered PDD.
Findings	There is no CAR/CL raised in this section.
Conclusion	The verification team has reviewed the database ^{/13/} , usage survey ^{/14/} etc., and found that IWM's distributed are in operation. The verification team has observed at the site that all physical operation of the IWMS is normal and can be easily tracked using ids punched on turbine runner. The implementation of the project matches with that mentioned in the registered PoA-DD/CPA-DD's. Thus the verification team has concluded that the project activity was implemented and operated as per registered PoA-DD/CPA-DD's. The verification team, based on the site visit and document review, was able to conclude that the project activity has been implemented as per the PoA-DD/CPA-DD's and that all physical features of the project are in place.

E.2.2. Implementation and operation of the management system

Means of verification	The verification team carried out onsite visits for the CPAs and interviewed key personnel and several households (sampled and non-sampled). Interviewees included the CME, project developer and the company who takes care of maintenance activity. It was established that the programme management system has been implemented and operated as described in the registered PoA-DD and CPA-DDs.
Findings	There is no CAR/CL raised in this section.
Conclusion	Based on document review, interview of management personnel, stakeholder interview, on-site verification, the verification team confirms the implementation and operation of the management system included in the registered PoA-DD and CPA-DDs.

E.2.3. Post-registration changes**E.2.3.1. Corrections**

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There are no corrections in this monitoring period.

E.2.3.2. Inclusion of a monitoring plan

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Not Applicable

E.2.3.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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Clarity with respect to the sampling approach applicable to the project activity is assessed and reported as permanent changes to the registered monitoring plan and it was approved on 10/06/2019.

E.2.3.4. Changes to the programme design

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Not applicable

E.2.3.5. Addition of CPA inclusion template

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Not applicable

E.2.3.6. Change of coordination/managing entity

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Not applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

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Not applicable

E.3. Component project activities

E.3.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	As per VVS version 2.0, the verification team determined the conformity of the actual project activity and its operation with the registered project design document. The verification team has, by means of a desk review and an onsite visit, assessed that all physical features of the proposed CDM project activity proposed in the PoA-DD and CPA-DDs are in place, and that the project participants have operated the CDM project activity as per the PoA-DD.
Findings	There is no CAR/CL raised in this section.
Conclusion	<p>The verification team determines the conformity of the actual project activity and its operation with the approved PoA-DD and CPA-DDs. CPA-1 to CPA-2 was also confirmed to be fully operational in accordance with the registered CPA-DDs. The verification team has, by means of a desk review and an on-site visit, assessed that all physical features of the proposed CDM project activity proposed in the PoA-DD and CPA-DDs are in place, and that the project participants have operated the CDM project activity as per the PoA-DD and CPA-DDs.</p> <p>The numbers of IWMs installed under CPA01 are 2199 comprising of both small shaft and long shaft IWMs, and were installed between 09/10/2011 to 13/03/2014. Since they are installed before the start date of the current MR period entire IWMs in CPA01 are considered for ER computation. For CPA 02, only 1138 IWMs are installed between 14/03/2014 and 17/10/2015, and the CPA02 was included in the PoA on 01/02/2017. Since the implementation modality of IWMs by AEPC is demand driven approach, the installation of the IWM is a continuous process rather than the phase wise installation. Once the IWMs are implemented and subsidy delivered, it is added to the database and included in the CPA by the CME (AEPC). The inclusion of IWMs in the CPA is continued until the ceiling of the particular CPA is fulfilled, for CPA02 the ceiling is determined as 2200.</p>

E.3.2. Post-registration changes**E.3.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents**

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There is no temporary deviation for this monitoring period from the registered PDD.

E.3.2.2. Corrections

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Not applicable

E.3.2.3. Changes to the start-date of the crediting period

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Not applicable

E.3.2.4. Inclusion of a monitoring plan

>>

Not applicable

E.3.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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Clarity with respect to the sampling approach applicable to the component project activity is assessed and reported, as permanent changes to the registered monitoring plan and it was approved on 10/06/2019.

E.3.2.6. Changes to the project design

>>

Not applicable

E.3.2.7. Changes specific to afforestation and reforestation activities

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Not applicable

E.3.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	The verification team determined whether the registered monitoring plan is in accordance with the applied methodology including applicable tools.
Findings	There is no CAR/CL raised in this section.
Conclusion	The verification team was able to confirm that the monitoring plan contained in the PDD is in accordance with the approved methodology applied by the project activity and its applicable tools.

E.3.4. Compliance of monitoring activities with the registered monitoring plan**E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	The verification team has determined whether all ex-ante parameters used for emission reduction calculation stated in the registered monitoring plan are used appropriately as per the registered PDD.
Findings	There is no CAR/CL raised in this section.
Conclusion	Refer Appendix 5 for details.

E.3.4.2. Data and parameters monitored

Means of verification	The verification team has determined whether the registered monitoring plan has been properly implemented and followed by the PP that the monitoring has been
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	carried out in accordance with the registered monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	Refer Appendix 5 for details.

E.3.4.3. Implementation of sampling plan

Means of verification	The verification assessed whether the compliance of the sampling efforts and surveys with the registered sampling plan in accordance with the Guideline for sampling and surveys for CDM project activities and programme of activities” ^{/15/} version 4.0, if PP had applied a sampling approach to determine data and parameters monitored.																																							
Findings	CL01 and CL05 were raised in this section.																																							
Conclusion	<p>The verification team checked “user survey” excels sheets and found ok. The sampling plan and the number selected are in line with “Standard for sampling and surveys for CDM projects activities and program of activities”.</p> <p>CME has adopted a common monitoring framework for all the specific case CPAs implemented under the PoA as the monitoring parameters for all CPAs implemented under the PoA are same. CME conducted an annual monitoring through monitoring surveys to monitor the following parameters in line with the registered PoA-DD.</p> <ol style="list-style-type: none">1. Daily operating hours of IWM for agro processing (generation of mechanical power)2. Number of IWM operating in each CPA <p>CME opted for a monitoring system where each CPA within the PoA is monitored. The monitoring parameter stipulated in the PoA DD is the “daily operating hours” and the systems operating under the CPAs. In order to monitor this parameter, CME commissioned an independent consultant through a competitive bidding process. The consultant, aligning with the monitoring requirements of the PoA estimated the sample required for the monitoring, drafted the questionnaires and mobilized the team for on-site survey. Having accumulated the information from the on-site survey, the consultant team prepared the reports for each CPA and submitted the same to the AEPC.</p> <p>CME had determined the sample size using stratified random sampling consistent with the monitoring plan of the PoA-DD and respective CPA-DDs and guidelines for sampling and surveys for CDM project activities and programme of activities (version 03). The sampling was performed within the level of precision of 10% and a confidence level of 90%. As per calculations a sample size of 26 (short shaft: 24 and long shaft: 2) were selected in CPA-1 is and 48 (short shaft: 46 and long shaft: 2) were selected for CPA-2. Since the PoA-DD and CPA-DD has set the minimum sample size of 33, the sample for both CPAs was enlarged to meet the sample calculation above for the particular period. The sample for the CPA-1 is maintained as 45 as in previous monitoring whereas sample for the CPA-2 is enlarged to 51 (addressing the non-responses also) hence the same was retained for the monitoring surveys for both, the proportional parameter and the mean value parameter.</p> <p>The samples are allocated proportionally to the types of IWMs (i.e. long shaft and short shaft) based on proportion of IWMs installed in these two strata randomly. The tables below depict the sample allocation against the installed IWMs in respective CPAs.</p> <p>Sample allocation for monitoring</p> <table><tr><th rowspan="2">CPAs</th><th colspan="3">Number of IWMs</th><th colspan="3">Sample calculated</th><th colspan="3">Sample adjusted</th></tr><tr><th>SS</th><th>LS</th><th>Total</th><th>SS</th><th>LS</th><th>Total</th><th>SS</th><th>LS</th><th>Total</th></tr><tr><td>CPA-1</td><td>160</td><td>2039</td><td>2199</td><td>24</td><td>2</td><td>26</td><td>41</td><td>4</td><td>45</td></tr><tr><td>CPA-2</td><td>45</td><td>1093</td><td>1138</td><td>46</td><td>2</td><td>48</td><td>47</td><td>4</td><td>51</td></tr></table> <p>Survey was conducted in the month of February to March, 2019. Enumerators were trained on structured questionnaires and mobilized in the field for data collection by CME</p>	CPAs	Number of IWMs			Sample calculated			Sample adjusted			SS	LS	Total	SS	LS	Total	SS	LS	Total	CPA-1	160	2039	2199	24	2	26	41	4	45	CPA-2	45	1093	1138	46	2	48	47	4	51
CPAs	Number of IWMs			Sample calculated			Sample adjusted																																	
	SS	LS	Total	SS	LS	Total	SS	LS	Total																															
CPA-1	160	2039	2199	24	2	26	41	4	45																															
CPA-2	45	1093	1138	46	2	48	47	4	51																															

	<p>The verification team used acceptance sampling approach for checking the operational status of the IWM's. A sample size of 22 was required, based on an AQL of 0.5% and UQL of 15%, the producer risk used is 5% and consumer risk used was 15%. In accordance with the para table on page no.11 of "Sampling and surveys for CDM project activities and programmes of activities", version 07.0</p> <p>However, the verification team visited 26 households (23 sampled households and 03 non-sampled households) in localities of Dolakha, Kavre and Ramechhap districts of Nepal. It was observed that all the IWMs were working in good condition and no discrepant records were observed with the published MR and survey sample records. Thus PP's set of records has been accepted.</p>
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E.3.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Not applicable as there is no monitoring equipment involved as per the registered monitoring plan in the PoA-DD and CPA-DD
Findings	There is no CAR/CL raised in this section.
Conclusion	The project activity does not involve any monitoring instruments that require calibration; hence no further assessment is done.

E.3.6. Assessment of data and calculation of emission reductions or net removals

E.3.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of baseline emission resulting from the registered PDD is correct. The verification team has checked whether calculations of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	CL02 was raised in this section.
Conclusion	Refer Appendix 5 for details.

E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of project emission resulting from the registered PDD is correct. The verification team has checked whether calculations of project GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	Project emission are not considered for the project activity In line with the validated PoA-DD and CPA-DD.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of leakage emission resulting from the registered PDD is correct. The verification team has checked whether calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	Leakage emission are not considered for the project activity In line with the validated PoA-DD and CPA-DD.

E.3.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the project activity. The verification team has checked whether calculations of GHG emission reduction have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	There is no CAR/CL raised in this section.
Conclusion	Verification team checked the ER calculation sheets ^{7/16/} and found formulae & data used in the emission reduction calculations are correct and in line with the applied

	<p>methodology. Further, there is no lack of evidence and/or missing data were detected for this monitoring period in the ER calculation sheet. The verification team confirms that all assumptions, emission factors and default values have been correctly justified and mentioned in the monitoring report.</p> <p>As there are no project and leakage emissions associated with the project activity (in line with PoA-DD and CPA-DDs and validated monitoring plan), the net emission reductions for the project in this monitoring period is 10,754 tCO₂e</p>
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Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
9889-0001	7190 tCO ₂ e	-	-	-	-	7190 tCO ₂ e
9889-0002	3,564 tCO ₂ e	-	-	-	-	3,564 tCO ₂ e
Total	10,754 tCO ₂ e	-	-	-	-	10,754 tCO ₂ e

E.3.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	The verification team has determined the CER achieved during this monitoring period with the estimated value and reason for increase if any.
Findings	There is no CAR/CL raised in this section.
Conclusion	The total number of ERs achieved during the monitoring period is 10,754 tCO ₂ e. In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DD for the current monitoring period.

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
9889-0001	7190 tCO ₂ e	11,022 tCO ₂ e
9889-0002	3,564 tCO ₂ e	11,273 tCO ₂ e
Total	10,754 tCO ₂ e	22,295 tCO ₂ e

E.3.6.6. Remarks on difference from estimated value in included CPA

Means of verification	The verification team checked the actual values achieved by the CPA during this monitoring period with the values estimated in ex-ante calculation in the included CPA-DD
Findings	There is no CAR/CL raised in this section.
Conclusion	<p>For the ex-ante calculation in CPA-DD, the equations given in section F.1 were used where following assumption were made:</p> $IC_{add} = IC_{IWM} - IC_{TWM}$ <p>IC_{IWM} - IWM installed capacity, kW (for long shaft: 2.8 kW and for short shaft: 1.39 kW)</p> <p>IC_{TWM} - TWM installed capacity, kW (0.35 kW)</p> <p>Q_{OP,i} : Number (quantity) of IWMs of type I operating under the project activity /units (Total: 2200 IWM for CPA-1 in which 440 long shaft and 1760 short shaft and total 2250 IWMs for CPA-2 where 1800 IWMs are short shaft and 450 IWMs are long shaft)</p> <p>EF_{Diesel} Emission Factor of diesel based power generators (1.2 kg CO₂/kWh as per AMS I.F)</p>

	<p>Using the equation below for baseline emission calculation,</p> $ER_y = \sum_{i=1}^n \frac{Q_{OP,i} * IC_{add,i} * OH_i * EF_{Diesel}}{1000}$ <p>Baseline emission for CPA-1 : 11,022 tCO_{2eq}/Year Baseline Emission for CPA-2: 11,273 tCO_{2eq}/Year</p> <p>Since project emission and leakage are not applicable for this PoA, they are taken as zero. So, the ex-ante emission reduction were calculated as follows for the CPAs which are applicable for this monitoring period:</p> <p>Emission Reduction for CPA-1: Baseline Emission-Project Emission-Leakage = 11,022 tCO_{2eq}/year Emission Reduction for CPA-2: Baseline Emission-Project Emission-Leakage = 11,273 tCO_{2eq}/year</p> <p>So total ex-ante emission reductions were 22,295 tCO_{2eq} But in comparison with the estimate in the registered CPA-DDs (22,295 tCO_{2eq}), the achieved value (10,754 tCO_{2eq}) i.e., in the present monitoring period is on the lower side in comparison to the actual realised value.</p>
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E.3.7. Assessment of reported sustainable development co-benefits

Means of verification	Not applicable
Findings	There is no CAR/CL raised in this section.
Conclusion	Not applicable

E.3.8. Global stakeholder consultation

Means of verification	The project MR was webhosted on UNFCCC website
Findings	There is no CAR/CL raised in this section.
Conclusion	The project MR was webhosted on UNFCCC website from 21/06/2019. There were no comments were received during this period i.e., for the 2 nd monitoring (https://cdm.unfccc.int/PoAIssuance/mon_db/poamon447257089/viewMR)

SECTION F. Internal quality control

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After the completion of assessment by the verification team all the relevant documentation is submitted to a qualified, Independent Technical reviewer as part of EPIC's internal quality control system. A Technical reviewer team is appointed to review the draft final verification report (Draft FVR). The comments made by the Technical reviewer team are taken into consideration and incorporated in the final FVR. The technical reviewer team assesses whether all the reporting requirements have been fulfilled and whether all the issues raised were closed satisfactorily by the verification team with justification. The technical review process can also raise issues in this regard which is resolved further by the verification team to the satisfaction of the technical reviewer. The technical reviewer team either accepts or rejects the report made by the verification team. The final report (after resolutions of all findings) is then submitted to the Head-operations for review and approval.

SECTION G. Verification opinion

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EPIC Sustainability Services Private Limited (EPIC) has been contracted by AEPC to undertake the independent verification of the registered CDM PoA titled "PoA for Promotion of the Improved Water Mills (IWM) in Nepal" (PoA ID: 9889)". The objectives of this verification are to verify and certify emission reductions reported for project activity of 01/01/2018 to 31/12/2018 (first and last day included); and to verify that the data reported are complete and transparent.

The verification team determines the conformity of the actual project activity and its operation with the validated project design document. EPIC has, by means of a desk review and an on-site visit, assessed that all physical features of the proposed project activity proposed in the PoA-DD / CPA-DD are in place, and that the project participants have operated the project activity as per the PoA-DD. Thus the verification team has

concluded that the project activity was implemented and operated as per PoA-DD, and that all physical features of the project are in place.

The verification team, based on the site visit and document review, was able to conclude that the project activity has been commissioned and implemented as per the PoA-DD. The start date of this monitoring period is 01/01/2018

The monitoring report for this monitoring period is in compliance with the monitoring plan of the validated PDD. The verification team was able to confirm that the monitoring plan contained in the registered PDD is in accordance with the approved methodology applied by the project activity "AMS-I.B - Mechanical energy for the user with or without electrical energy" (Version 12) and its applicable tools. It was confirmed during the site visit that the project activity during the current periodic verification is in accordance with the applicability criteria of the methodology.

The management of project participants is responsible for the preparation and reporting of GHG emissions data, and the reported GHG emission reduction on the basis set out within the project monitoring plan. The development and maintenance of records and reporting procedures in accordance with the monitoring plan, including the calculation and determination of GHG emission reduction from the project is the responsibility of the management of the project. It is the responsibility of EPIC to express an independent GHG verification opinion on the GHG emissions reductions and on the calculation of GHG emission reductions from the project for this monitoring period based on the reported emission reduction in the monitoring Report.

EPIC's verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive board. EPIC's approach was risk-based, drawing on an understanding of the risks associated with reported GHG emissions data and the controls in place to mitigate these. The examination includes assessment of evidence relevant to the amounts and disclosures in relation to the project's GHG emission reductions for this monitoring period.

The verification team has planned and performed the work to obtain the information and explanations that is considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

The verification team has verified that the information included in the revised monitoring report is correct and that the emission reduction achieved has been determined correctly. Based on the information seen and evaluated, the verification team confirms the following:

Project title:	PoA for Promotion of the Improved Water Mills (IWM) in Nepal
CDM PoA id:	9889
PoA-DD Registered CPA-DD & Validated CPA-DD of both CPA 1 and CPA 2. Monitoring report	Version 10.0, dated 22/04/2019 Version 10.0, dated 22/04/2019 Version 4.0, dated 22/04/2019 Version 03, dated 05/11/2019; 02 nd Verification
Methodology used for verification:	AMS-I.B. ver. 12 - Mechanical energy for the user with or without electrical energy
Applicable monitoring period:	01/01/2018 to 31/12/2018 (first and last day included), second verification
Emissions reductions verified:	10,754 tCO _{2e}

SECTION H. Certification statement

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EPIC Sustainability Services Private Limited (EPIC has carried out the independent verification of the registered CDM PoA titled "PoA for Promotion of the Improved Water Mills (IWM) in Nepal" (PoA ID: 9889) covering CPA01 and CPA02 for the monitoring period of 01/01/2018 to 31/12/2018 (first and last day included).

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

EPIC takes responsibility for issuance of an independent verification statement on the reported GHG emission reductions from the project activity.

The verification was done on the basis of the baseline and monitoring methodology (End-use energy efficiency improvement; “AMS-I.B - Mechanical energy for the user with or without electrical energy” (Version 12) and the monitoring report (version 03, dated 05/11/2019). The verification included checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and the collection of evidence supporting the reported data.

The emission reductions are calculated correctly and EPIC could certify that the emission reductions from the CDM PoA id: 9889 “PoA for Promotion of the Improved Water Mills (IWM) in Nepal” for the monitoring period of 01/01/2018 to 31/12/2018 (first and last day included) is 10,754 tonnes of CO₂ equivalent.

Prepared and submitted by:
 Dr.D.Siddaramu, Team Leader

Appendix 1. Abbreviations

Abbreviations	Full texts
AEPC	Alternative Energy Promotion Centre
AMS	Approved Methodology for Small-scale
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reductions
CME	Coordinating Managing Entity
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
CL	Clarification Request
CPA-DD	Component Project Design Document
DOE	Designated Operational Entity
DMs	Diesel Mills
ER	Emission Reductions
ESSPL	EPIC Sustainability Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gases
GoN	Government of Nepal
GSCP	Global Stakeholder Consultation Process
IPCC	Intergovernmental Panel on Climate Change
IWM	Improved Water Mill
kW	Kilo Watt
LE	Leakage Emissions
MP	Monitoring Plan
MR	Monitoring Report
MoV	Means of Verification
NA	Not applicable
PCC	Project Completion Certificate
PCP-PoA	Project Cycle Procedure - Programme of Activities
PDD	Project Design Document
PE	Project Emissions
PP	Project Participant
PRC	Post Registration Changes
PS-PoA	Project Standard - Programme of Activities
PoA-DD	Programme Design Document
QA/QC	Quality Assurance/Quality Control
RFP	Request for Proposal
RSCs	Regional Service Centres
ToR	Terms of Reference
TWMs	Traditional Water Mills
UNFCCC	United Nations Framework Convention on Climate Change
VVS-PoA	Validation and Verification Standard - Programme of Activities

Appendix 2. Competence of team members and technical reviewers

Name	Dr. D. Siddaramu	Mr. Narendra Ghimire	Mr. R. Vijayaraghavan	Mr. K. Sudheendra
Role	Leader		Technical Reviewer	T.E assisting Technical Reviewer
Competence in relevant sectors	Sector 01, 03 and 13	Sector 01	Sector 01, 03 and 13	Sector 01
Responsibility	Document review, DVR preparation, DVR resolution, FVR preparation	Document review, onsite	Technical review	Technical review

Dr. D. Siddaramu holds a M.Sc., Ph.D in Environmental Science, with over 16 years of experience. A qualified Clean Development Mechanism (CDM) Lead Auditor, successfully registered more than 30 projects with United Nations Framework Convention on Climate Change (UNFCCC) and Verified Carbon Standard registry (VCS) registry; well versed with both National and International legal regime. Has hands on experience in Environmental Impact Assessment (EIA) studies pertaining to different Ecosystem; monitoring, collection & analysing environmental samples and conducting socio-economic surveys; data analysis. Conducting CDM/VCS audits, preparation of validation protocols and reports. He is qualified for Sector 1 based on CDM accreditation requirements and qualified lead auditor as per GS4GG EPIC accreditation.

Mr. Narendra Ghimire has 10 years of experience working in the field of Hydropower sectors in various capacities. He has been extensively involved in Planning and engineering of number of hydropower projects for the development. He has served as Hydropower Engineer and Team Leader in the designing and Construction supervision of Hydropower Projects in Nepal. He has Worked as Resident Engineer and Deputy Resident Engineer for the Hydropower Projects in Nepal. He has led multi-disciplinary team of Engineers, Geologists, Economists, Sociologists and Environmental experts assigned to conduct pre-feasibility, feasibility studies and design of hydropower projects. He served as Team Leader and Design Team Leader in conducting studies of various hydropower projects. He is a qualified Technical Expert under CDM validation and verification services for Sectoral Scope 1 in accordance with procedures of EPIC Sustainability Services Pvt. Ltd.

Mr. R. Vijayaraghavan holds BE in Mechanical Engineering, M.Tech in Energy Conservation and Management and MBA in Technology Management. He is certified as Energy Auditor by Bureau of Energy Efficiency (BEE), Government of India. He has 10 years of working experience in energy sector including validation / verification of fifty CDM and VCS/GS projects and has undergone extensive training on CDM validation and verification and has been qualified as technical reviewer for several sectoral scopes. He is also an ISO 26000 lead auditor certified by Professional Evaluation and Certification Board (PECB).

Mr. K. Sudheendra, holds a Bachelor's Degree in Electrical Engineering. He has more than 30 years of experience in Energy Sector. He has been trained in the CDM validation and verification processes, and he is a qualified Technical Expert as well as Technical Reviewer as per EPIC's qualification criteria.

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UNFCCC	Validation and verification standard for Project Activity version 2.0	1	UNFCCC
2	PP	Registered project design document (PoA-DD), version 8.0 dated 03/08/2015	2	PP
3	PP	Validated and approved project design document (PoA-DD) version 10.0 dated 22/04/2019	3	PP
4	UNFCCC	PoA validation reports	4	UNFCCC
5	UNFCCC	Registered CPA-DD's (CPA 1 to CPA 2)	5	UNFCCC
6	PP	Validated and approved CPA-DD's (CPA 1 version 10.0, dated 22/04/2019 and CPA 2, version 4.0, dated 22/04/2019)	6	PP
7	UNFCCC	CPA validation reports	7	UNFCCC
8	PP	Monitoring report (Initial)	8	PP
9	UNFCCC	AMS-I.B.: Mechanical energy for the user with or without electrical energy --- Version 12.0	9	UNFCCC
10	UNFCCC	Guidelines for Application of materiality in verifications version 3.0	10	UNFCCC
11	PP	Monitoring report (Final), version 03, dt. 05/11/2019	11	PP
12	UNFCCC	CDM-PoA-MR-FORM, version 03	12	UNFCCC
13	PP	Project database	13	PP
14	PP	Usage survey-2018 records	14	PP
15	PP	Guideline for sampling and surveys for CDM project activities and programme of activities, version 4.0	15	PP
16	PP	ER calculation sheets	16	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FARs from validation and/or previous verification

FAR ID	01	Section no.		Date:	21/10/2019
Description of FAR					
IWM with tag no AEPC/IWM/002/1010 (Krishna Prasad Pakuwal) which was initially registered as long-shaft is running in short-shaft mode due to the damage caused by earthquake, since it was clarified by the IWM owner that the damaged component of IWM would be set right in due course to be functional as long shaft again, the operational type of this IWM shall be verified in the next verification.					
CME response					Date: 23/10/2019
The IWM mentioned above is accounted as short shaft while estimating the emission reduction for this monitoring period as well which is conservative. This was also confirmed during the monitoring. Please see section 3.1, Box 1 of the IWM User Survey Report 2018. CME confirm that, this will be accounted as short shaft IWM for the consecutive monitoring as conservative approach.					
Documentation provided by the CME					
SD 1# IWM Users Survey 2018_CPA-2.pdf					
DOE assessment					Date: 24/10/2019
The clarification by CME is acceptable, during the site visit verification team checked the IWM and discussed with the owner. The re-installed IWM is a short shaft, hence FAR01 is closed.					

Table 2. CLs from this verification

CL ID	01	Section no.		Date:	21/10/2019
Description of CL					
Under subsection (c) of Section E.3 (page no.16), it is indicated that "Survey was conducted in the month of February to March, 2019". But in other sections of the MR it is mentioned that "IWM User survey done in 2017", clarify					
CME response					Date: 23/10/2019
For this monitoring period, the survey was conducted in the month of February to March 2019. In other section, it is corrected appropriately.					
Documentation provided by the CME					
9889_MR_IWM PoA_MP-2_V02_Clean.doc 9889_MR_IWM PoA_MP-2_V02_Trackchange.doc					
DOE assessment					Date: 24/10/2019
The clarification by CME is ok. In the month of February to March 2019, user survey is done for the present monitoring period (i.e., 01/01/2018 to 31/12/2018). The revised MR is modified and for better clarity in user survey dates/years. Hence CL01 is closed.					

CL ID	02	Section no.		Date:	21/10/2019
Description of CL					
During site visit to IWMS, 03 of the households visited IWM were not working from last 02 weeks, the reason given by the IWM owners was that "they are not operating because of Duseera festival and will start operations in the coming week". Now PP to clarify whether this is taken into account in the user survey and ER calculations?					
CME response					Date: 23/10/2019
As per the monitoring plan, stratified sampling was applied for the survey of different monitoring parameters. As stated in section E.3 of the MR, the operational days in a year for the monitoring period varies from 265.64 days to 315 days for short shaft and long shaft. So, during the survey, all those non-operational days are accounted and the same is used for the ER calculation. The IWM User Survey Report for 2018 for CPA-1 and CPA-2 is provided with this response.					
Documentation provided by the CME					
SD 2# IWM Users Survey 2018_CPA-1.pdf SD 1# IWM Users Survey 2018_CPA-2.pdf					
DOE assessment					Date: 24/10/2019
The clarification by CME is acceptable, IWM User Survey Report for 2018 for CPA-1 and CPA-2 & ER calculation sheets were checked and found the non-operational days are not accounted for ER calculations. Hence CL02 is closed.					

CL ID	03	Section no.		Date: 21/10/2019
Description of CL				
PP to clarify, if the time period between first survey and second survey is more than 02 years, then how would the project respond?				
CME response				Date: 23/10/2019
Time period for the first survey and second survey is not more than 02 years. The field survey for previous user survey was done in February-April 2018. This can be evidenced from the monitoring report in section E.3, sub-section (c) of the previous monitoring report under the PoA website (9889_MR_IWM_PoA_MP-1_V04_Clean.pdf). This can also be evidenced in the IWM user Survey report 2017 and IWM user survey report 2018. So, this is in-line with the registered PoA-DD.				
Documentation provided by the CME				
SD 2# IWM Users Survey 2018_CPA-1.pdf SD 1# IWM Users Survey 2018_CPA-2.pdf SD 3# IWM USER Survey 2017_CPA-1.pdf SD 4# IWM User Survey 2017_CPA-2.pdf				
DOE assessment				Date: 24/10/2019
The clarification by CME is acceptable on the gap between survey and as it is in-line with the registered PoA-DD. Hence CL03 is closed.				

CL ID	04	Section no.		Date: 21/10/2019
Description of CL				
During the site visit in the areas visited there were IWM's installed and operational from 2004-05, PP to clarify				
<ol style="list-style-type: none"> 1. How project IWMs are identified monitored and 2. What is the procedure adopted to avoid double counting 				
CME response				Date: 23/10/2019
<ol style="list-style-type: none"> 1. The IWMs installed on and after 9 October 2011 are included in the PoA and database is maintained accordingly. Furthermore, there is unique Kit number given for each IWMs and CDM code are given for those IWMs which are included in CDM PoA. So, out of those IWMs only, the monitoring is done. 2. As stated above, there is unique kit number engraved in the IWM and CDM code is also provided to the IWMs included in the PoA. So, this approach avoids the double counting and is being applied in the PoA. 				
Documentation provided by the CME				
SD 5# IWM CPA Database_Updated.xlsx				
DOE assessment				Date: 24/10/2019
The clarification by CME is ok; during site visit the unique kit number engraved in the IWM were checked. The project database also provides a CDM code of IWMs included in the PoA. Hence the approach followed avoids the double counting in the PoA and is acceptable. Hence CL04 is closed.				

CL ID	05	Section no.		Date: 21/10/2019
Description of CL				
Under subsection (d) of Section E.3 (page no.16), it is mentioned that "..... Similarly, a thorough check of the questionnaires filled up by the enumerators was done during the field survey and any inconsistency was corrected immediately". Clarify				
<ol style="list-style-type: none"> 1. What inconsistency are corrected immediately in the filled in questionnaires and 2. Was there any inconsistency in the questionnaires of the current monitoring period? If so submit the questionnaires highlighting the portions corrected 				
CME response				Date: 23/10/2019

1. For the quality assurance/quality control of the survey, this is the standard approach to minimize the inconsistency in the questionnaires filled in by enumerators. But in this monitoring period, no such inconsistency was observed as this is the third periodic survey done for the IWM PoA.
2. As mentioned above, this is the standard approach to be followed during the survey. No inconsistency was observed in this monitoring period. The sub-section (d) of section E.3 of the MR is corrected appropriately.

Documentation provided by the CME

9889_MR_IWM PoA_MP-2_V02_Clean.doc

9889_MR_IWM PoA_MP-2_V02_Trackchange.doc

DOE assessment**Date:** 24/10/2019

The clarification by CME is ok, the usage survey questionnaires were checked and found no corrections, hence acceptable and CL05 is closed.

Table 3. CARs from this verification

CAR ID	01	Section no.		Date: 21/10/2019
Description of CAR				
The PP to submit the following records/documents for verification				
1) MoU between households and PP for ownership of GHGs				
2) User survey documents/records - February to March, 2019 and 2017				
3) Filled in Questionnaires				
4) IWMs Database of both CPAs				
5) Grievance mechanism records (if any)				
CME response				Date: 23/10/2019
1) The emission reduction right transfer signed by the IWM owner is attached. See 11 th page of the SD 6# provided which is in Nepali.				
2) User Survey Reports for CPA-1 and CPA-2 for 2017 (done in Feb-April 2018) and 2018 (Done in Feb-March 2019) are attached as SD 1#, SD#2, SD#3 and SD 4#				
3) Sample filled in questionnaires are attached as SD 7#				
4) IWM database for the CPA-1 and CPA-2 is attached as SD 5#				
5) The minor technical issues are addressed by the IWM owners and the major issued is taken care by service centers. Since no any grievances are put by the IWM owner, the records are not available for this monitoring period.				
Documentation provided by the CME				
1. SD 6# Commissioning Report of IWM.pdf				
2. SD 1# IWM Users Survey 2018_CPA-2.pdf				
SD 2# IWM Users Survey 2018_CPA-1.pdf				
SD 3# IWM USER Survey 2017_CPA-1.pdf,				
SD 4# IWM User Survey 2017_CPA-2.pdf				
3. SD 7# Filled in Questionnaires_IWM User Survey.pdf				
4. SD 5# IWM CPA Database_Updated.xlsx				
DOE assessment				Date: 24/10/2019
The requested records/documents for verification were submitted by CME. The verification team checked the documents/records submitted and found ok. Hence CAR01 is closed.				

CAR ID	02	Section no.		Date:	21/10/2019
Description of CAR					
The PP to submit the following records/documents for verification					
<ol style="list-style-type: none"> 1) Document to support Technical life of IWM 2) Training records of field staff/enumerators 3) Submit records/documents to support CPA01 and CPA02 start date 					

CME response	Date: 23/10/2019
<ol style="list-style-type: none"> 1. The technical life is taken as 10 years for the IWM. This can be evidenced in the SD 8# under section 5.2 Page 16. This has been validated by DOE during registration. 2. The training records of the enumerators for the survey is given in IWM user survey reports. See section 2.2.12 and annex 3 of SD 1# and SD 2#. 3. The CPA start date for the CPA01 is the date on which PoA documents were uploaded for Global Stakeholder process. This has been validated by DOE in the validation report. The same can be evidenced in the UNFCCC website: https://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/ET8VSFNNQ40UXSGV6QG8WB1HRXLN5A/view.html. Start date for the CPA02 is 14/03/2014 which is the date the first IWMs installed in this CPA. The commissioning report is provided for the IWM installed on 14/03/2014 (See 6th page of SD 6# for the installation completion certificate which is in Nepali) and is also validated by DOE during CPA inclusion. This has been confirmed by CME during first verification as well (See SD 9# submitted during first verification). 	
Documentation provided by the CME	
<ol style="list-style-type: none"> 1. SD 8#<i>Determining the capacity of LS and SS IWM_EDS.pdf</i> 2. SD 1# IWM Users Survey 2018_CPA-2.pdf SD 2# IWM Users Survey 2018_CPA-1.pdf 3. SD 6# <i>Commissioning Report of IWM.pdf</i> SD 9# <i>IWM Start Date Letter_CPA2.pdf</i> 	
DOE assessment	Date: 24/10/2019
The requested records/documents for verification were submitted by CME. The verification team checked the documents/records submitted and found ok. Hence CAR02 is closed.	

Table 4. FARs from this verification

FAR ID	Nil	Section No.		Date: 21/10/2019
Description of FAR				
CME response				Date: DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				Date: DD/MM/YYYY

Appendix 5. Data and parameters fixed ex-ante and monitored

IC TWM - Traditional Water Mill (TWM) installed capacity, kW	0.35 (during the study the average capacity of TWM was found to be 0.35 kW) taken from Study report-Determining the capacity of Long Shaft and Short Shaft Improved Water Mill (IWM), Final Report, Energy Development Services Pvt. Ltd. May 2012. The verification team confirms that the value applied is in accordance with registered PoA-DD.						
IC IWM - Improved Water Mill (IWM) installed capacity	Minimum value of 1.39 kW for short shafts and Minimum value of 2.83 kW for long shaft IWMs are used on conservative basis as more than 97% of SS and LS IWMs are with installed capacity above these values (as per the third part study report). Mill specifications form manufacturer. Based on eligibility criterion 5, the capacity of SS and LS IWM is 1.39 and 2.83 KW respectively have been fixed on conservative basis. The verification team confirms that the value applied is in accordance with registered PoA-DD.						
EF Diesel - Emission Factor of diesel based power generators. For diesel based mills	1.2 kg CO ₂ /kWh taken from AMS I.F, Version03 1.2 for 100% load, 1.4 for 50 % load and 2.4 for 25% load. As the emission factor for diesel is more conservative with 100% load, this has been chosen for emission factor for diesel. The verification team confirms that the value applied is in accordance AMS I.F, Version03.						
Number (quantity) of IWMs of type i operating under the project activity Q _{OP,i}	<p>Calculated parameter based on Ex-post monitoring survey for</p> <ul style="list-style-type: none">➤ CPA-1 = Long Shaft: 50% (out of sampled IWM) & Short Shaft: 95.12% (out of sampled IWM) and➤ CPA-2 = Long Shaft: 50 % (out of sampled IWM) & Short Shaft: 87.23% (out of sampled IWM) <p>The surveys are done annually and the value is used for calculation of baseline emissions. The verification tem has reviewed the usage survey for 2018 and accepted the value as correct.</p> <p>The verification team has verified the sample size calculation spreadsheets with the monitored data, where the actual achieved precision is calculated as per “Standard for sampling and surveys for CDM project activities and programme of activities”, version 7.0, and confirms that the calculation of achieved reliability was done correctly. The verification team confirmed from the sample size calculation spread sheet that the required precision was kept 10% during sample size calculation</p> <table><tr><th>Parameters</th><th>Precision achieved (%)</th><th>Is the required precision</th></tr><tr><td></td><td></td><td></td></tr></table>	Parameters	Precision achieved (%)	Is the required precision			
Parameters	Precision achieved (%)	Is the required precision					

		CPA-1	CPA-2	achieved? (≤10%)
	Operational Status, ($Q_{OP,i}$)	6.4	9.59	Yes
	Operational hours per year, ($OH_{i,y}$)	6.89	4.2	Yes
	Operational hours per day, ($OH_{i,y}$)	5.32	3.92	Yes
	<p>From the above table, it is conformed that sampling was performed within the desired level of precision of 10% and a confidence level of 90%, for all the monitored parameters, and the survey results are directly used in the ER calculations.</p>			
Operating hours of IWM for mechanical power generation $OH_{i,y}$	<p>Calculated parameter based on Ex-post monitoring survey for</p> <ul style="list-style-type: none"> ➤ CPA-1 = Long Shaft: 11 hours daily (315 operational days per year) & Short Shaft: 9.9 hours daily (265.64 operational days per year) and ➤ CPA-2 = Long Shaft: 12 hours daily (265 operational days per year) & Short Shaft: 10.29 hours daily (273.71 operational days per year) <p>The surveys are done annually and the value is used for calculation of baseline emissions. The verification tem has reviewed the usage survey for 2018 and accepted the value as correct.</p>			
Number (quantity) of IWMs of type i installed under the project activity $Q_{T,i}$	<p>Calculated parameter obtained from Testing and Commissioning report/database and project implementing agency records/IWM subsidy list</p> <ul style="list-style-type: none"> ➤ CPA-1 = Long Shaft: 160 & Short Shaft: 2039 ➤ CPA-2 = Long Shaft: 45 & Short Shaft: 1093 <p>The value is used for calculation of baseline emissions. The verification tem has reviewed the Testing and Commissioning report/database and project implementing agency records/IWM subsidy list and accepted the value as correct.</p>			

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Document information

Version	Date	Description
03.0	31 May 2019	<p>Revision to:</p> <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); • Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.

<i>Version</i>	<i>Date</i>	<i>Description</i>
Decision Class: Regulatory		
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