




**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	2.1	
Completion date of the verification and certification report	14/08/2020	
Monitoring period number and duration of this monitoring period	Monitoring period number: 03 01/01/2019 to 31/12/2019	
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 (AEPIC)	
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: 7,728 tCO ₂ e CPA-2: 3,674 tCO ₂ e Total: 11,402 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 third 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 01/01/2019 to 31/12/2019 (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 01/01/2019.

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	√	X	√	√
2.	Host Country Expert	ER	Narendra	Ghimire		√	X	√	√

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	

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.
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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 02^{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: DD/MM/YYYY				
No.	Activity performed on-site	Site location	Date	Team member
1.	No site visit			

No physical on-site inspection (with presence of the EPIC verification team) was conducted as part of the performed verification assessment.

Regardless of none of the conditions/requirements which are established by paragraph 321¹ of the CDM-VVS-PoA were valid/applicable for the particular case of the verification assessment for the considered monitoring period, it was anyway previously mutually agreed between EPIC and AEPC that an on-site inspection to the project site was to be performed as part of the verification assessment for the considered monitoring period (with such on-site inspection being previously planned and scheduled to occur within the first week of June - July, 2020).

In June-July 2020, as a result of raised travelling restrictions related to the COVID-19 pandemic, the EPIC verification team proposed to APEC to as an alternative, consider postponing such on-site visit by taking into account not only travelling restriction related official decisions and recommendations from local authorities, but also related travelling restriction policy announced by EPIC's office due to the COVID-19 pandemic.

As an answer to such proposal from EPIC, AEPC highlighted to the EPIC verification team that they were not in a position to accept any postponing of on-site visit that would result on delay on submission of CER issuance request for the considered monitoring period since the company has a valid CER

¹321. It is mandatory for the DOE to conduct an on-site inspection at verification for the included CPA if:

(a) It is the first verification for the DOE with regard to this CPA;
 (b) More than three years have elapsed since the last on-site inspection conducted for verification for the CPA; or
 (c) The CPA has achieved more than 300,000 t CO₂ eq of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.

delivery/forwarding schedule valid for emission reductions achieved by the project activity during the considered monitoring period.

By acknowledging PP's commitment for CER delivery, finally by taking into consideration all guidance and requirements of the CDM-EB agreed relaxing of the rule requiring mandatory on-site inspection by DOEs for a 03-month period (from 23/03/2020 to 23/06/2020) because of COVID-19 pandemic, which is contained in para 26 of CDM EB 106 report). The Executive Board of the Clean Development Mechanism (CDM) agreed on 23 June 2020 to, on an exceptional basis, considering the COVID-19 pandemic, to extend the period in which CDM Designated Operational Entities (DOEs) may apply alternative measures of validation/verification to mandatory on-site inspections until 31 December 2020. EPIC verification team thus performed its document review and interviews with representatives of the project participant (of which details are included in Sections D.1 and D.3 respectively) by incorporating the following additional checking's/assessments as complementary auditing measures.

The previous concluded verification assessment for the project activity (i.e., 2nd verification) was also performed by EPIC (monitoring period from 01/01/2018 to 01/12/2019), it is relevant to note that, as outlined in the verification report for this particular previously concluded CDM assessment, the appointed EPIC verification team previously performed a complete on-site inspection to the project site from 14/10/2019 to 19/10/2019. Thus, by taking into consideration guidance and requirements of the CDM-EB recently agreed relaxing of the rule requiring mandatory on-site inspection by DOEs as well as by taking into consideration principles and guidance from the CDM-VVS-PoA, it is reasonable to assume that related findings and observations previously gathered by the EPIC verification team while performing such on-site inspection to the project activity from 14/10/2019 to 19/10/2019 are, upon a certain limit, also representative and relevant in the context of the verification assessment for the considered monitoring period (for which a physical on-site inspection was not performed due to travelling restrictions associated the COVID-19 pandemic).

Based on its accumulated expertise and experience not only with previous CDM verification assessments for the project activity, but also with CDM assessments for other similar project-based initiatives, it is EPIC opinion that objectives to be expected for a physical on-site inspection to the project site were sufficiently reached by the EPIC verification team through (i) Tele call to the IWM households to check the operation status and conditions of the IWMs on 03/08/2020 and (ii) by consideration by the EPIC verification team of findings and observations from the last previously verification assessment for the project activity (including inter-alia, all findings and observations resulted from the previously performed physical on-site inspection to the project activity from 14/10/2019 to 19/10/2019).

In summary, by taking all above-presented aspects into account vis-à-vis applicable requirements established in CDM-VVS-PoA, version 02.0 and by also taking into account the CDM-EB recently agreed relaxing of the rule requiring mandatory on-site inspection by DOEs; EPIC's verification team judged that performing the above-described additional checking's/assessments (complementary auditing measures) instead of performing the physical on-site inspection to the project site is deemed acceptable and sufficient to have the overall quality and completeness of the performed verification assessment not being negatively affected.

EPIC did not conduct an on-site inspection; however as a means of verification², the alternative means were used for verifying the project.

To confirm the information and to resolve issues identified in the document review. The verification team had discussion with PP as a part of verification activity and involved:

- ✓ An assessment of the implementation and operation of the CDM programme of activity as per the PoA-DD/CPADD's
- ✓ A review of information flows for generating, aggregating and reporting of the monitoring parameters
- ✓ interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan
- ✓ A cross-check between information provided in the MR and data from other sources
- ✓ 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
- ✓ A review of calculations and assumptions made in determining the GHG data and ERs, and
- ✓ An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters

²322. For cases that are not referred to in paragraph 321 above, it is optional for the DOE to conduct an on-site inspection at verification. If the DOE does not conduct an on-site inspection as a means of verification, it shall describe the alternative means used and justify that they are sufficient for the purpose of verification.

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Pokhrel	Prem Kumar	Climate and Carbon Expert, AEPC	03/08/2020	Project activity, ER calculations, Sampling, Monitoring, QA/QC procedures, Documentation, Record keeping, Customer complaints	Audit team
2.	Thapa	Rana Bdr.	Section head, APEC			
3.	Darlami	Hari Bdr.	MSPL			
4.	Darlami	Narayan Bdr	MSPL			
5.	23 Households in localities of Dhading, Kaski, Nuwakot, Doti, Okhaldhunga, Rukum and Ramechhap districts of Nepal			03/08/2020	IWMs operation & its type, operating hours, O&M, Non-working hours (if any, and reasons), water availability, Customer complaints, 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 20%, the producer risk used is 5% and consumer risk used was 5%. In accordance with table on page no.13 of "Sampling and surveys for CDM project activities and programmes of activities", version 08.0

However, the verification team interviewed 23 households (randomly selected households from the list) in localities of Dhading, Kaski, Nuwakot, Doti, Okhaldhunga, Rukum 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	-	-	-
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 ³			
• 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	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	-	-	-
• Implementation of sampling plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	-	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	CL01	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Usage survey	CL02 and CL03	-	-

³ 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).

Double counting	CL04	-	-
Usage survey questionnaires	CL05 and CL06	-	-
Documents/Training records	-	CAR01 and CAR02	-
Total	06	02	Nil

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., 03rd 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 3 rd monitoring period). RFR for the second monitoring period is issued.
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 3 rd monitoring period). RFR for the second monitoring period is issued.

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.
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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

>>

Not applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

>>

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	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. The numbers of IWMs installed under CPA01 are 2,199 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 1,138 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.

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

>>

Not applicable

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

>>

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

>>

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

>>

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 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</p>

on-site survey, the consultant team prepared the reports for each CPA and submitted the same to the AEPC.

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 21 (short shaft: 19 and long shaft: 2) were selected in CPA-1 and 43 (short shaft: 41 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. Hence the same was retained for the monitoring surveys for both, the proportional parameter and the mean value parameter.

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.

Sample allocation for monitoring

CPAs	Number of IWMs			Sample calculated			Sample adjusted		
	SS	LS	Total	SS	LS	Total	SS	LS	Total
CPA-1	160	2039	2199	21	2	23	44	6	50
CPA-2	45	1093	1138	41	2	43	46	4	50

Survey was conducted in the month of February to June, 2020. Enumerators were trained on structured questionnaires and mobilized in the field for data collection by CME.

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 20%, the producer risk used is 5% and consumer risk used was 5%. In accordance with table on page no.13 of "Sampling and surveys for CDM project activities and programmes of activities", version 08.0

However, the verification team interviewed over phone 23 households (randomly selected households from the list) in localities of Dhading, Kaski, Nuwakot, Doti, Okhaldhunga, Rukum 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.

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	There is no CAR/CL 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	CL01 was 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 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. 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 11,402 tCO _{2e}

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO _{2e})	Project emissions or actual net GHG removals by sinks (tCO _{2e})	Leakage (tCO _{2e})	GHG emission reductions or net GHG removals by sinks (tCO _{2e})		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
9889-0001	7, 728 tCO _{2e}	-	-	-	-	7,728 tCO _{2e}
9889-0002	3,674 tCO _{2e}	-	-	-	-	3,674 tCO _{2e}
Total	11,402 tCO _{2e}	-	-	-	-	11,402 tCO _{2e}

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 11,402 tCO _{2e} . 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.
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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	7,728 tCO _{2e}	11,022 tCO _{2e}
9889-0002	3,674 tCO _{2e}	11,273 tCO _{2e}
Total	11,402 tCO_{2e}	22,295 tCO_{2e}

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 (11,402 tCO_{2eq}) i.e., in the present monitoring period is on the lower side in comparison to the actual realised value.</p>

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 11/07/2020. (https://cdm.unfccc.int/PoAIssuance/mon_db/poamon621577975/viewMR)
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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 01/01/2019 to 31/12/2019 (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 01/01/2019

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 13/08/2020; 03 rd Verification
Methodology used for verification:	AMS-I.B. ver. 12 - Mechanical energy for the user with or without electrical energy
Applicable monitoring period:	01/01/2019 to 31/12/2019 (first and last day included), third verification
Emissions reductions verified:	11,402 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 01/01/2019 to 31/12/2019 (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 13/08/2020). 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 01/01/2019 to 31/12/2019 (first and last day included) is 11,402 tonnes of CO₂ equivalent.

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
Role	Leader		Technical Reviewer
Competence in relevant sectors	Sector 01	Sector 01	Sector 01
Responsibility	Document review, DVR preparation, DVR resolution, FVR preparation	Document review, onsite	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, 3 and 13 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).

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/CME	Registered project design document (PoA-DD), version 8.0 dated 03/08/2015	2	PP
3	PP/CME	Validated and approved project design document (PoA-DD) version 10.0 dated 22/04/2019	3	PP
4	UNFCCC	PoA validation reports	4	UNFCCC

CDM-PoA-VCR-FORM

5	UNFCCC	Registered CPA-DD's (CPA 1 to CPA 2)	5	UNFCCC
6	PP/CME	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/CME	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/CME	Monitoring report (Final), version03	11	PP
12	UNFCCC	CDM-PoA-MR-FORM, version 03	12	UNFCCC
13	PP/CME	Project database	13	PP
14	PP/CME	Usage survey-2020 records	14	PP
15	PP/CME	Guideline for sampling and surveys for CDM project activities and programme of activities, version 8.0	15	PP
16	PP/CME	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	NA	Section no.	Document Review	Date:07/08/2020
Description of CL				
Nil				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	Document Review	Date:07/08/2020
Description of CL				
Clarify why the “Amount achieved during this monitoring period (tCO ₂ e)” is almost less by 50% when compared to the “Amount estimated ex-ante for this monitoring period in the CPA-DD (t CO ₂ e)”.				
Project participant response				Date: 07/08/2020
<p>The amount of the emission reduction depends on the operational status of the IWM for the monitoring period and the operational hours in a year. So, the calculation of emission reduction may go up and down as the parameter varies during the monitoring period. The other reason for reduction of the emission reduction is the number of IWMs installed in CPA. Total number of IWMs in the CPA-2 was considered as 2,250 while estimating the ex-ante value whereas the actual number of IWM installed in CPA-2 is 1,138. Which is almost 50% of the number considered for ex-ante calculation. Similarly, the number of IWMs in CPA-1 is 2199. Considering all these parameters, the amount of emission reduction achieved during the monitoring period is less than the ex-ante estimated value. See the ER calculation sheet for detail.</p>				
Documentation provided by project participant				
ER Calculation Sheet: SD#1-9889_Emission Reduction Calculation spreadsheet_MP-3_v.1				
DOE assessment				Date: 08/08/2020
<p>The clarification by PP on the “Amount achieved during this monitoring period (tCO₂e)” is almost less by 50% when compared to the “Amount estimated ex-ante for this monitoring period in the CPA-DD (t CO₂e)” is accepted and hence CL01 is closed.</p>				

CL ID	02	Section no.	Document review	Date:07/08/2020
Description of CL				
During the verification of IWMs, some of the IWM households have informed that the IWMs were not working for few days to 03 months or more. How this is taken care in the ER estimation/calculations?				
Project participant response				Date: 07/08/2020

The survey was done following the sampling and survey guidelines indicated in the approved PoA-DD. During the monitoring of the PoA, it was found that the IWMs were found closed during repair and maintenance and due to other reasons. So, the average operation hours in a day and average operational days in a year are captured during the monitoring survey. So while calculating the emission reduction, the operational days accounted for long shafts varies from 235 to 247.5 days per year for CPA-1 and CPA-2 respectively whereas the operational days accounted for the short shaft IWMs varies from 274.4 to 277.86 days per year. Since those values were calculated statistically from the survey done as per the approved PoA-DD, PP is in the opinion that the calculation of ER has taken care those non-operational days appropriately. Please see the IWM user Survey reports and ER calculation sheet for calculation of the operational days and operational hours and ER calculation.

Documentation provided by project participant	
<ul style="list-style-type: none"> ER Calculation Sheet: SD#1-9889_Emission Reduction Calculation spreadsheet_MP-3_v.1 User Survey Reports: <ul style="list-style-type: none"> SD#2.1-Final Report_IWM Survey_CPA-1-2019 SD#2.2-Final Report_IWM Survey_CPA-2-2019 	
DOE assessment	Date: 08/08/2020
The clarification by PP on IWM's working from days to months and its consideration in ER calculations is accepted and hence CL02 is closed.	

CL ID	03	Section no.	Document review	Date: 07/08/2020
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?				
Project participant response				Date: 07/08/2020
PP has maintained the survey frequency as per the registered PoA-DD. The last survey was done in February/March 2019 and is not more than 02 years. This can be evidenced from the section E.3 of approved monitoring report for the second MP. The link for the MR for the second monitoring period is provided. PP has been maintaining the survey frequency since first monitoring period and is in-line with the approved PoA-DD.				
Documentation provided by project participant				
Monitoring report verified for second MP: https://cdm.unfccc.int/filestorage/N/U/L/NULVSYZF13KTD52HAEWJOM7B6PCG80/9889_MR_IWM%20PoA_MP-2_V03.pdf?t=UHI8cWVvcXlrfDBjmTD3teeBggTInyuiuS-Z				
DOE assessment				Date: 08/08/2020
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.	Document review	Date: 07/08/2020
Description of CL				
Clarify on the procedure adopted to avoid double counting of CER's				
Project participant response				Date: 07/08/2020

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 was done. So, this approach avoids the double counting and is being applied in the PoA. Please see the database of CPA for the reference.	
Documentation provided by project participant	
IWM database: SD#3-IWM CPA Database_Updated	
DOE assessment	Date: 08/08/2020
The clarification by CME on the unique kit number engraved in the IWM is ok. 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.	Document Review	Date: 07/08/2020
Description of CL				
Under subsection (c) of Section E.3, it is indicated that “ <i>Survey was conducted in the month of February to June, 2020</i> ”. Clarify why it took 05 months to complete the survey.				
Project participant response				Date: 07/08/2020
The survey was actually started from March 2020. Please see the section 2.3.4 of the user survey reports. It took long time due to COVID 19 pandemic as the nation-wise lockdown was started in Nepal from 24 March 2020. However, enumerators were mobilized in March 2020 for the survey and they covered 79 IWMs (38 IWMs from CPA-1 and 41 IWMs from CPA-2) were covered before lockdown was started. Though 33 samples for each CPAs are sufficient as per the CPA-DD, the samples were enlarged to 50 each for each CPAs to make it more representative. After waiting for the lockdown to be eased to cover remaining 21 samples, it took time and due to uncertainty of releasing the lockdown completely and the cases in rural areas, the telephonic survey was conducted for the remaining 21 households in June. So, to prepare the final report, it took longer time than expected however the survey covered the minimum sample required as per the PoA-DD in March, 2020 itself. So, section E.3 of the MR is corrected appropriately.				
Documentation provided by project participant				
<ul style="list-style-type: none"> Revised MR: 9889_MR_IWM PoA_MP-3_V02_Clean 9889_MR_IWM PoA_MP-3_V02_Trackchange Lockdown news: https://kathmandupost.com/national/2020/03/23/nepal-goes-under-lockdown-for-a-week-starting-6am-tuesday 				
DOE assessment				Date: 08/08/2020
The reason for delay in the survey is accepted, hence CL05 is closed.				

CL ID	06	Section no.	Document review	Date: 07/08/2020
Description of CL				
Under subsection (d) of Section E.3 (page no.16), it is mentioned that “..... <i>Similarly, a thorough check of the questionnaires filled up by the enumerators was done during the field survey and any inconsistency was corrected immediately</i> ”. Clarify				
<ol style="list-style-type: none"> What inconsistency are corrected immediately in the filled in questionnaires and Were there any inconsistencies in the questionnaires of the current monitoring period? If so submit the questionnaires highlighting the portions corrected 				

Project participant response	Date: 07/08/2020
<ol style="list-style-type: none"> 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 monitoring done for the IWM PoA. 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 project participant	
Revised MR: 9889_MR_IWM PoA_MP-3_V02_Clean 9889_MR_IWM PoA_MP-3_V02_Trackchange	
DOE assessment	Date: 08/08/2020
The clarification by PP is ok and accepted, hence CL06 is closed	

Table 3. CAR from this verification

CAR ID	01	Section no.	Document review	Date: 07/08/2020
Description of CAR				
<ol style="list-style-type: none"> How effective is the survey conducted and What training is imparted to the field personal in this regard? 				
Project participant response				Date: 07/08/2020
<ol style="list-style-type: none"> Monitoring of the IWM PoA is conducted through a survey as mentioned in the registered PoA-DD following the monitoring plan mentioned in PoA-DD. To make the survey more effective, PP has adopted the third party monitoring which was done by third party consultant. As the similar approach were adopted in first and second monitoring period for this PoA and were verified successfully, the survey conducted in this monitoring is also effective as its follow the monitoring plan indicated in the PoA-DD and employ third party for the monitoring. The data collection is done through enumerators and were trained before employing them in the field. Also, pre-testing of the survey was also done. Specially, the training on the data collection and filling up of questionnaires was provided to the field enumerators in capturing the data and discussion with owners and the users. The record (attendance) for the training is provided in annex 5 of the survey report whereas it is described in section 2.3 of the survey report. 				
Documentation provided by project participant				
User Survey Reports: SD#2.1-Final Report_IWM Survey_CPA-1-2019 SD#2.2-Final Report_IWM Survey_CPA-2-2019				
DOE assessment				Date: 08/08/2020
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.	Document review	Date: 07/08/2020
Description of CAR				
The PP to submit the following records/documents for verification <ol style="list-style-type: none"> Document to support Technical life of IWM Training records of field staff/enumerators 				

Project participant response	Date: 07/08/2020
<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#4 under section 5.2 Page 16. This has been validated by DOE during registration. 2. The training records are given in IWM survey reports for CPA-1 and CPA-2. See the record (attendance) for the training in annex 5 of the survey report whereas it is described in section 2.3 of the survey report. 	
Documentation provided by project participant	
<ol style="list-style-type: none"> 1. <i>SD#4-Determining the capacity of LS and SS IWM_EDS</i> 2. <i>User Survey Reports:</i> SD#2.1-Final Report_IWM Survey_CPA-1-2019 SD#2.2-Final Report_IWM Survey_CPA-2-2019 	
DOE assessment	Date: 08/08/2020
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 2. FARs from this verification

FAR ID	Nil	Section No.		Date: 05/08/2020
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: 83.33% (out of sampled IWM) and Short Shaft: 95.45% (out of sampled IWM) &➤ CPA-2 = Long Shaft: 100% (out of sampled IWM) and Short Shaft: 93.48% (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 2020 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 colspan="2">Precision achieved (%)</th><th rowspan="2">Is the required precision achieved? (<10%)</th></tr><tr><td></td><td>CPA-1</td><td>CPA-2</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>	Parameters	Precision achieved (%)		Is the required precision achieved? (<10%)		CPA-1	CPA-2				
Parameters	Precision achieved (%)		Is the required precision achieved? (<10%)									
	CPA-1	CPA-2										

	Operational Status, ($Q_{OP,i}$)	5.35	8.77	Yes
	Operational hours per day, ($OH_{i,y}$)	2.56	4.92	Yes
	Operational hours per day, ($OH_{i,y}$)	4.24	5.81	Yes
	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.			
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: 10.4 hours daily (235 operational days per year) & Short Shaft: 10.14 hours daily (274.4 operational days per year) and ➤ CPA-2 = Long Shaft: 9 hours daily (247.5 operational days per year) & Short Shaft: 9.53 hours daily (277.86 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 2020 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>			

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.
<p>Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying</p>		